A History of Engraving and Etching Techniques

Developments of Manual Intaglio Printmaking Processes, 1400–2000

PLVS OVLTRE

Device of Emperor Charles V

A History of Engraving and Etching Techniques

Developments of Manual Intaglio Printmaking Processes, 1400–2000

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor

aan de Universiteit van Amsterdam

op gezag van de Rector Magnificus

prof. dr. D.C. van den Boom

ten overstaan van een door het college voor promoties ingestelde commissie

in het openbaar te verdedigen in de Aula der Universiteit

op 9 november 2012, te 11.00 uur

door Adrianus Cornelis Jacobus Stijnman

geboren te Oudewater

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Contents

Foreword

I apologise in advance for all that I have omitted and all that I have included. The subject-matter was engrossing, and it was difficult to confine it within a narrow area.

Julia Frankau[1]

The main title of this study is derived from the title of the third and final edition (1923) of Arthur M. Hind's famous and still reprinted volume on the history of intaglio prints: *A History of Engraving & Etching, from the 15th Century to the Year 1914*.[2] When I started using it I wondered why a book so rich in information about prints and their history had, except for the introductory chapter on 'Processes and Materials', so little to say about the history of the techniques that had produced these engravings and etchings in the past centuries.[3] My main comment about Hind's description of technique is that he bases himself largely on the habits of his days. Although he states that the student of the print must know about technique, he pays little attention to the many nuances, inventions and developments from the preceding five centuries and how these influenced the changing appearance of the print.

Nevertheless, over the years Hind's work was a conceptual guide for me and my study follows the main line of his technical introduction. It is therefore appropriate and in homage that I refer to the title of his book extending the date for the present study with another century and emphasising technical developments.

On discussing with Mark Clarke – himself a bibliographer of mediaeval art technological sources – the several thousand references for the dissertation on which my book is based, he advised me that 'a PhD is supposed to have critical thought, not just an assembly of material'. To which I replied that in my experience a massive amount of material needs to be assembled and processed in order to support a few critical thoughts on the history of intaglio printmaking processes. This particular material is largely absent in standard reference works on print history as well as on printmaking technique.[4] Consequently knowledge about it is also largely absent with the professionals in these fields. The absence of any comparable overview of historical developments in intaglio printmaking techniques is therefore one of my reasons for bringing together so much material. There is not a standard reference work – comparable to Hind's – upon which I could continue and only after its assembly could I express some critical thoughts.[5]

Finally, as concerns my manner of writing, I apologise in advance for my language not being as flowery as John Evelyn's, not as eloquent as Julia Frankau's and not as gentlemanlike as Howard Levis'. The following study mainly discusses practical issues and my choice of words mirrors the down-to-earth matters approached.

The beginnings of the present study lay in September 1985 when I was asked to write a thesis within the field of librarianship. I chose to compile a bibliography based on the list of references in my *Etsvademecum* (1985).[6] I enlarged this list to a bibliography of practical handbooks on engraving, etching and intaglio printing, but the introduction to the subject was written mainly from my practical experience as a printmaker.[7]

In the two decennia following I gathered an exhaustive list of printed monographs and articles in periodicals with additional references to some manuscripts, which together are the primary sources of my study. Printmaking practice also allowed me to discern between descriptive and instructive texts, the latter being the subject of my bibliography. Understanding historical working practices was fuelled by reading these instructions, understanding workshop interiors, the roller presses on which prints were pulled, reconstructions of materials and techniques, and scientific analysis of prints. Close observation of the prints in combination with all the above allowed for the interpretation of both the observed and the studied material.

From the start of this period I was fortunate to be guided by such people as Johan de Zoete, Rob Meijer, Ger Luijten, Basil Hunnisett and Peter Norbert Heilmann. Fons van der Linden († 1997) – always with a smile – satisfied my curiosity in matters of prints and printing, and despite my (then) youth asked for my opinion on his far more sophisticated writings.

All this goes back to my early teens when my cousin Kees van Wijk showed me how to print a drypoint plate properly. When I wanted to learn more about etching he advised me: 'Buy a book'.

The canon of the history of the print is rewritten with every new reference work on prints. Some names are repetitive, newcomers are added and disappear again. Particular prints and printmakers and their influence on future generations are recorded. The best choices are, however, always personal. This study, too, is written from personal preferences. Sometimes I get carried away by prints, their techniques and the history of techniques. At these moments time is not a factor – printmaking over the past six centuries is all one to me.

The following description of the technical developments from the first intaglio prints in the fifteenth century to modern processes, relating technique to style, allows the reader to look into the historical detail as well as the broad overview. I hope you will enjoy both.

<div align="right">Ad Stijnman</div>

Notes

1
Frankau 1900: xii.
2
Hind 1963.
3
Hind 1963: 1-18.
4
Most typical was the absence of a list of engravers active up to 1500, which I therefore had to compile myself; Appendix 2, p. 409.
5
See my questions and remarks in the main text and especially the Summary and Final Conclusions, p. 403.
6
Stijnman 1985.
7
Stijnman 1986.

Samenvatting en conclusies

Dit boek concentreert zich op de ontwikkelingen in de manuele diepdrukprocédés. Het brengt daarmee in kaart wat er waar en wanneer gebeurde, en welk effect techniek had op het eindproduct – de prent. Het is een geschiedenis over mensen: hoe ze werkten en onder welke omstandigheden; hoe ze opgeleid werden en waar hun materialen vandaan kwamen; met wie ze communiceerden over hun beroep en hoe hun ideeën over kwaliteiten in de kunst de praktijk van het maken van grafiek stimuleerden. Het laat zien hoe nieuwe werkwijzen de stijl van prenten beïnvloedden, dat techniek en stijl na verwant zijn aan elkaar, en dat de één niet ondergeschikt is aan de ander.

Manuele diepdruk betreft het creëren van structuren in de oppervlakte van een vlakke plaat. Daarna worden de groeven met inkt gevuld, het oppervlak schoongemaakt en de plaat wordt op een plooibare drager afgedrukt. Met andere woorden, een prent ontstaat uit twee gescheiden procedures: het maken van de plaat en het afdrukken van de plaat. Samen bepalen ze hoe de prent er uitziet. Voor grafici is dat een vanzelfsprekend proces, maar voor anderen niet altijd.

Een afbeelding in het oppervlakte van metaal krassen of graveren wordt al vele eeuwen gedaan en het vullen van groeven met een kleurige substantie is ook al lang bekend. De nieuwe grafische techniek die in de jaren 1430 in het bovenrijnse gebied verscheen – en de eigenlijke uitvinding die het begin van de manuele diepdruk betekende – was het maken van een afdruk (in spiegelbeeld) van de voorstelling in de plaat. Dat gebeurde door het overbrengen van op olie gebaseerde drukinkt vanuit de groeven van de gegraveerde metalen plaat op een blad papier. Dit kon worden herhaald om een oplage te drukken. Voor diepdruk wordt gewoonlijk papier als drager gebruikt, omdat als dat vochtig is het gemakkelijk in de groeven kan worden geperst om de inkt op te nemen. Met vochtig perkament zou dat ook wel kunnen, maar het was erg duur. Papier maken werd in de dertiende eeuw in Europa geïntroduceerd en papier kwam snel in grotere hoeveelheden op de markt om begin vijftiende eeuw het kostbare perkament te vervangen. Kort daarop verschijnen de eerste op papier gedrukte gravures, in navolging van op papier gedrukte houtsnedes. Je kan hieraan zien dat de vroege ontwikkeling van de manuele diepdruk direct verbonden was aan de beschikbaarheid van papier tegen een schappelijke prijs.

Vanaf het midden van de vijftiende eeuw zien we een gestage ontwikkeling van de manuele diepdruk en informatie over de techniek verspreidde zich naar ander europese gebieden. De kwaliteit van de drukinkt verbeterde, de rollenpers werd rond 1460 uitgevonden en het etsen van ijzeren drukplaten begon in Augsburg in het midden van de jaren 1490. Het etsen van koperplaten begon twintig jaar later in Italië en kort daarop in Nederland. Tegen die tijd had de eerste werkelijk grote graficus, Albrecht Dürer (1471–1528), een stylistisch indrukwekkend oeuvre opgebouwd, een voorbeeld voor generaties van graveurs. Alles bij elkaar kan je daarom zeggen dat rond 1525 de manuele diepdruk volwassen is geworden. Het was volledig professioneel en de technische en stylistische grondslagen, dwz hoe het moest worden gedaan en hoe het eruit moest zien, waren gelegd voor de komende vijf eeuwen. De manuele diepdruk verspreidde zich vervolgens naar het oosten en westen. Het volgde de europese handelsroutes en kolonisaties om daarmee de wereldwijd succesvolle kunsttechniek te worden die het vandaag de dag is.

De verdere technische ontwikkeling van het maken van prenten komt naar voren in vele uitvindingen en heruitvindingen door de eeuwen heen. In een aantal gevallen kennen we de namen van uitvinders of eerste gebruikers van bepaalde ets- en graveertechnieken. Dit komt omdat hun experimenten het hebben overleefd, zoals de prenten van Lucas van Leyden (1489/1494–1533) waarin hij etsen combineerde met graveren, of omdat uitvindingen schriftelijk werden vastgelegd, zoals John Evelyn (1620–1706) de mezzotinttechniek beschreef en schetste. Communicatie is van primair belang, omdat zonder de verspreiding van informatie technische ontwikkelingen met hun uitvinders uitsterven. Vanaf de tweede helft van de achttiende eeuw werden nieuwe technieken in tijdschriften gepubliceerd zodra als hun uitvinders dat geschikt vonden. Patenten werden uitgevaardigd waarin ontwerpen van gereedschap en machines, en van graveer- en drukprocessen in detail waren vastgelegd. Bij elkaar zorgde dat voor een sterke stimulans van de grafische industrie.

Na de afschaffing van de gilden op het europese continent rond 1800, de introductie van de fotografie en de explosieve uitbreiding van de grafische industrie werd het graveren en etsen van afbeeldingen slechts een mechanische procedure. Persoonlijke interpretatie, werkwijze en het eigen 'handschrift', de redenen waarom zoveel graveurs beroemd geworden waren en de trots van een legioen anderen, verdwenen. De handmatig vervaardigde prent had plaatsgemaakt

voor de grootschalige mechanisatie van de grafische industrie tegen het midden van de negentiende eeuw. De kunstenaar-etsers van de tweede helft van de negentiende eeuw deden vervolgens een stap terug en namen een elitaire positie in. Kijkend naar de prenten van beroemde voorgangers, met name de etsen van Rembrandt, concludeerden ze dat een prent alleen maar een origineel kunstwerk kon zijn als de plaat was ontworpen, vervaardigd en gedrukt door dezelfde persoon. Dit is een houding die we nog steeds zien bij de huidige grafici en grafiekliefhebbers.

Het afdrukken van de plaat hoort net zo bij de manuele diepdruk als het graveren, zoals al is opgemerkt. Beide processen volgden ook hun eigen ontwikkeling. Technieken om platen te maken verliepen via een reeks historische hoogtepunten. Bij het drukken zien we dat minder: papier, inkt, pers, schoonmaakmaterialen en druktechnieken ontwikkelden zich maar langzaam. Vanwege de toegenomen professionalisatie scheidden het maken en het drukken van de plaat zich geleidelijk aan in de loop van de zestiende eeuw. Het plaatdrukken werd een specialisatie op zich en in bepaalde perioden en op bepaalde plaatsen was het de graveur zelfs wettelijk verboden om zijn eigen platen af te drukken.

Diepdrukken in kleur vinden we continu vanaf de jaren 1460. Het drukken in kleur van oplagen van enig volume schijnt echter niet uitgevoerd te zijn voor de late zeventiende eeuw met de herintroductie van de *à la poupée* methode door Johannes Teyler (1648–vóór 1709). Daarna heeft het onderzoek van Jacque Christoph Le Blon (1667–1741) voor een belangrijke stap voorwaarts in de kleurendiepdruk gezorgd. Hij combineerde theorie met praktijk en voerde de driekleurendruk in blauwe, gele en rode inkt in. Zijn baanbrekend werk heeft de basis gelegd voor alle nieuwe kleurendrukmethoden van de grafische industrie tot op heden. Als gevolg hiervan wendden kunstenaar-etsers zich in de tweede helft van de negentiende eeuw ook af van kleur, om dit aan de grafische industrie over te laten.

Etsen en plaatdrukken werden standaard in de kunstopleidingen in de loop van de twintigste eeuw, met eigen faciliteiten en speciaal ingerichte ateliers. Het aantal beroepsgrafici, studenten en amateurs in de grafiek nam vanaf de jaren 1960 sterk toe – ateliers werden uitgebreid en grotere hoeveelheden schadelijke vluchtige chemicaliën gebruikt. Dit maakte het nodig om de gezondheids- en veiligheidsaspecten van het maken van grafiek opnieuw te bekijken. In het begin gebeurde dat door de aanleg van afzuiginstallaties in de ateliers, tot de vraag naar niet-vluchtige etsgronden, oplosmiddelen en zuren in de jaren 1990 groeide. De ontwikkeling en het gebruik van deze nieuwe materialen schiep nieuwe uitdagingen voor grafici, welke op hun beurt de esthetiek van de prent beïnvloedden.

In beginsel is de geschiedenis van de grafiek een geschiedenis van de grafische technieken. Concept, compositie en formaat kunnen van te voren worden vastgelegd. De selectie van de materialen en de keuze van de werkwijzen, in combinatie met technische beslissingen die tijdens het werken worden gemaakt en het 'handschrift' van de schepper, bepalen echter het uiterlijk van het eindproduct – verander één element en de prent ziet er anders uit. Het antwoord op de hoofdvraag van mijn onderzoek betreffende de samenhang tussen techniek en stijl is daarom dat deze relatie volledig is, zoals dat met vele voorbeelden door de gehele tekst wordt aangetoond.

Dit boek gaat echter verder dan dat. Het beantwoordt een aantal technische vragen uit vroegere literatuur door nieuwe documentaire informatie te verschaffen of door te verwijzen naar informatie waar prentonderzoekers en grafici normaal niet naar kijken. Een voorbeeld is het begin van het etsen van koperplaten na 1500, wat samenhangt met de toenemende productie van buskruit voor de oorlogsvoering in die periode. De beschikbare hoeveelheden salpeter (kaliumnitraat), het onmisbare bestanddeel van buskruit, bevorderde mede de grootschalige distillatie van salpeterzuur (waterstofnitraat), een zogenaamd mineraal zuur dat zeer geschikt is om koper te etsen. Een ander voorbeeld is dat veel grafische procédés hun historische voorlopers hebben. Om er een paar te noemen, aquatint en crayonets, uitgevonden in de achttiende eeuw, hebben hun voorgangers respectievelijk in de zeventiende en zestiende eeuw. Moderne grafici die op zoek waren naar veiliger werkwijzen begonnen dezelfde materialen als hun voorgangers van eeuwen her te gebruiken, zoals schoonmaken met plantaardige olie in plaats van met vluchtige oplosmiddelen en het etsen met een zoutoplossing in plaats van met een mineraal zuur. Diepdruk in kleur en het drukken op gekleurde dragers hebben middeleeuwse achtergronden. We kunnen nu zeggen dat kleur, anders dan het met de hand inkleuren, een constante factor was in de manuele diepdruk door alle tijden heen vanaf het midden van de jaren 1460. Wat onderzocht moet worden is voor welke functies, voor wat voor onderwerpen, in welke sociale kringen, en wanneer kleurendruk gebruikelijker was.

De materieel-technische aspecten van de geschiedenis van de grafiek in deze studie hebben een gedegen basis gekregen door het ontlenen van gegevens aan de uitputtende lijst van primaire bronnen in de Bibliografie van Practische Handboeken (Appendix 4). Deze bibliografie is de meest uitgebreide en bijdetijdse in zijn soort. Hierbij komt nog een grote hoeveelheid informatie ontleend aan beeldbronnen en materiële bronnen, en het geheel wordt ondersteund door een zeer ruime keuze aan secundaire literatuur. Dit was nodig omdat een vergelijkbaar werk over de geschiedenis van de graveer- en etstechnieken waarnaar ik kon verwijzen en waarop ik verder kon bouwen ontbrak. Door een algemeen en tegelijkertijd gedetailleerd overzicht samen te stellen vult dit boek hiaten op in onze kennis over de gegraveerde en geëtste prent en tegelijkertijd zijn nieuwe vragen ontstaan. Bijvoorbeeld, een interessant onderwerp voor een vervolgstudie zouden de sociale aspecten van de zakelijke kant van de grafiek zijn. Het geval van Simon Collin laat zien hoe een parijse meester plaatdrukker het beste van de gilderegelementen maakte, ondanks het beleid van de franse overheid in het begin van de achttiende eeuw. Door te trouwen met de weduwe van een drukker en zijn kinderen weer te laten trouwen met andere drukkers probeerde hij de economische situatie van zijn familie te

verbeteren. Parijse plaatdrukkers besloten in deze periode ook om als groep de wederzijdse samenwerking te bevorderen en de eigen gilderegels stricter na te leven.

Een relatief nieuw gebied binnen de studie van grafiek betreft de wereldwijde verspreiding van de manuele diepdruk. In het verleden zijn er al wat voorzichtige stappen genomen, maar de huidige studie is de eerste die een volledig overzicht hiervan verschaft, wat alleen maar laat zien hoe weinig we van dit onderwerp afweten. Studenten in de prentgeschiedenis worden daarom aangemoedigd om zich op dit nieuwe gebied te wagen en het begin en de ontwikkelingen van de manuele diepdruk in aziatische, zuid-amerikaanse en afrikaanse landen en in Oceanië te verkennen.

Acknowledgements

I dedicate this dissertation to my parents

Introduction

'The time has come,' the Walrus said,
'To talk of many things:
Of shoes – and ships – and sealing-wax –
Of cabbages – and kings –
And why the sea is boiling hot –
And whether pigs have wings.'
Lewis Carroll[1]

This study is a survey of the history of manual intaglio printmaking processes: the history of the techniques of engraving, etching and plate printing. Its primary aim is to present a concise as well as detailed overview of developments of the material aspects of intaglio printmaking from its beginnings in the early fifteenth century until the present day. These developments are observed in the light of the coherence between the technique of the intaglio print, ie its materials and production processes in relation to its 'style'. In the context of this book, style is defined as the aesthetics or outward appearance of the print inclusive of its intrinsic qualities. Furthermore, this is related to the person(s) who created the print and to the fashion typical for a particular social group, place and time.[2]

Origin and Structure of this Study

My interest in this subject was stimulated by the absence of an overall view of the historical developments of engraving and etching techniques. A number of historical studies on some of these processes have been published over the past two centuries, but they are rarely elaborate. In addition, the same few technical treatises are generally referred to in modern art historical literature on printmaking, causing speculation and lack of nuance by the absence of more detailed documentary information. Moreover, any research into economic, educational and social aspects of intaglio printmaking as well as the supply of materials, tools and machines is largely missing in earlier studies.

This encouraged me to compile a new and exhaustive list of primary sources on intaglio printmaking techniques.[3] The result is the Bibliography of Practical Manuals (Appendix 4), which contains printed monographs and articles, including 75 manuscript texts, with practical information concerning manual intaglio printmaking techniques. These sources form the basis of this study. Whereas earlier studies relied on a few of the better known manuals, the amount and variety of information presented here makes it possible to follow developments throughout the centuries in greater detail than was previously possible.

This study has been carried out from an encyclopaedic point of view, resembling Arthur M. Hind's well-known example.[4] The approach is systematic in principle and the following information is presented in chronological order as far as is possible. The discussions of the various topics are cyclical, however. A certain redundancy is thereby created, which supports the better understanding of the historical context. For example, Chapter 1 describes materials and techniques used in the fifteenth and beginning of the sixteenth century. Its endnotes refer to related sections in the following chapters for more detailed discussions on these topics, because more information is available from later periods, which in turn allows a better understanding of mediaeval practices. Chapter 2 describes workshop interiors, with further references to Chapters 3 and 4 where technical procedures are discussed in detail. Another point is that the same equipment might be used in different contexts. For example, a stove is used for heating the plate before applying the etching ground in Chapter 3, and for warming the plate for inking and wiping in Chapter 4. When the

etching and printing was carried out by one person in one workshop the same stove is likely to have been used, but with the growth of professionalism, workshops separated and became specialised, developing equipment for particular use but derived from common antecedents. This certain amount of redundancy and the many cross-references to other paragraphs give coherence to related topics in different chapters, place a particular topic in its own as well as in a wider historical context, allow for free movement throughout the book and open up new vistas.

Chronological tables with historical landmarks at the beginning of each chapter serve to retain the historical overview and allow the placement of particular developments in a wider context.[5] Events and observations are selected that note the first use of a particular material or the beginning of a particular technique. Historical developments are divergent: with some tools such as the burin, little to nothing changes over the centuries while a particular technique such as mezzotint has a clear starting point in 1642. The pigment Frankfurt black, the main colorant used for intaglio printing ink during three centuries, comes into use before the end of the sixteenth century only to disappear again around 1900.

The present text is divided into four chapters: (1) the antecedents, beginning and early developments of manual intaglio printmaking processes, with an additional overview of the worldwide dissemination of engraving and etching; (2) the trade of intaglio printmaking; (3) the production of the matrix; (4) the printing of the matrix.

A distinction is made between the making of the plate and the printing of the plate, the two main technical activities involved in creating a print. At the start of intaglio printmaking, one individual will have carried out everything by himself, but activities clearly began to separate and professionalise from around 1500 to recombine again in the second half of the nineteenth century. Separation was due to economic reasons; recombination was due to ideas concerning the print as a work of art, ideas that were forced by the growth of the printing trade and more in particular by the role of photography in graphic processes.

Concerning the practical use of this book, references in the endnotes guide the reader to primary sources (monographs and manuscripts) and primary sources (articles in journals) in Appendix 4 Bibliography of Practical Manuals and secondary literature in Literature. They can be recognised as follows:

> references to primary sources (monographs and manuscripts) are in bold type with both place and date between brackets: **Seibold** (Esslingen 1922); the addition of place and date make it possible to follow what happened where and when.
> references to primary sources (articles in journals) are in bold type with date only between brackets: **Jacque** (1852). References to the secondary literature are in italics with the date: *Prevenier 1992*.

Further details are given at the start of each of the three lists (see pp. 433, 570 and 605).

Art History and Printmaking

Modern art historians considering the qualities of a print usually have only limited practical experience of printmaking, while printmakers are generally less well informed about the history of their own craft. The combination of craft and concept is therefore rare in either theoretical or practical studies on printmaking, although the two are inherent in every print because a concept is materialised by an artist or craftsman in order to be communicated to an audience. My study aims to bridge this gap by discussing the materials and techniques of intaglio printmaking used over the past six centuries, as referred to in primary sources and discussed in modern literature. The main objective is to give an understanding of historical developments of intaglio printmaking processes in order to elucidate considerations on the appearance and the style of a print.

The basic tools and materials used in intaglio printmaking did not change over six centuries. The differences between a fifteenth- and a twenty-first-century burin are minor, and plate printing is still done on paper with ink using a similar kind of construction of roller press that was invented in the fifteenth century. Most importantly, from its beginnings in an Upper Rhine studio, intaglio printmaking is still practised worldwide and, as proof of its success, advances in the technique are still being made.

Many variations on the intaglio printmaking process were invented over the course of the centuries, however, either to carry out the same function more efficiently or from a different artistic concept. In their turn, these inventions promoted the separation between artistic printmaking and the printing industry in the nineteenth century. By the end of the twentieth century, we can see how the introduction of digital photography and digital image processing influenced printmaking, this time combining manual processes with materials and working practices that are intended essentially for the printing industry. In all cases these new techniques profoundly affected the appearance of the print, creating imagery never seen before.

Main Issues

What all objects of art or craft have in common is that they are made by handling selected materials in particular ways after particular ideas. That means that a series of decisions is made by the creator(s) of the artwork during the production process in order to unite material and concept. Looking from an historical point of view at engraving and etching techniques the question therefore is: what happened where and when, and what effect did it have on the print? To answer this I will 'talk of many things' indeed. In discussing the material aspects of intaglio printmaking, details are given on the kinds of metals and the formats of printing plates, how plates are engraved and etched, on papers, oils and pigments, construction of the press, and how many prints can be pulled from a plate. Next, these issues are placed in the wider context of technical developments during six centuries. Throughout the text materials and techniques are related to the appearance of the prints produced.

Technique and Style

He who dwells in artists' workshops must have experienced the deep gap between the actual 'craftsmen' in the arts and the art historians, which is understandable, because in both camps the same subject is discussed in very different languages.

Heinrich Wölfflin[6]

For a true appreciation of prints it is essential to understand the main principles of the various processes by which plates may be engraved.

Arthur M. Hind[7]

Another alternative to 'meaningless connoisseurship' might be the careful study of technique. If only it were possible to avoid transgressing the boundaries between technique and style. Obviously such a wish flies in the face of human endeavor, but the suggestion has the merits of focusing more on specific workshop characteristics than on general formal qualities.

Richard S. Field[8]

Practice is indispensable if one wishes to attain the characteristics supposed to be possessed habitually by the great artists.

George Lansing Raymond[9]

I think mediums can turn you on, they can excite you: they always let you do something in a different way, even if you take the same subject, if you draw it in a different way, or if you are forced to simplify it, to make it bold because it is too finicky.

David Hockney[10]

The present history is about people: how they worked and under what conditions; how they were educated and who supplied materials; with whom printmakers communicated about their craft and how their ideas about qualities in art stimulated the practice of printmaking. It shows that new working practices influenced the appearance of prints, that technique and style are closely related, and that the one is not subordinate to the other.

The above citations sketch what we are discussing. Wölfflin observes the gap between the practising artist and the criticising art historian, working from different mentalities, although concerned with a common interest. Hind and Field underscore this, adding that the historian of the print would benefit from knowing about technique in order to observe 'specific workshop characteristics'. And even if one is born a genius, Raymond indicates, with Mozart

in mind, continually practising one's technique is indispensable in order to evolve one's artistic talent. Hockney, from his position as artist, explains how he can be captivated by a particular medium and the important role that the medium plays in his expression of the concept.

Art technology and prints

This is a study in art technology focusing on engraving and etching techniques as media of expression in the arts. The intention is to guide art historians, art lovers and artists through the workshops of engravers and printers of the past, and of printmakers of the present. It is about the men and women, both professionals and amateurs, using their burins and acids, pigments and presses, in order to exhibit an idea or emotion, to create or reproduce an image, or merely to cut a stamp or etch a greeting card. On the one hand, it demonstrates that there is no fundamental difference between the choice of technique for one concept or another: a burin is a burin and acid is acid. On the other hand it shows how the choice of a material and the way in which it is handled or worked closely relate to the particular concept.

Jan van der Stock proposed a method of using the print as an historical source by placing it in its widest possible context, connected to every craft and service involved. He questioned the meaning of the print for Western culture and concluded that only interdisciplinary research could answer this.[11] Art history has always had an interest in inventors and engravers, those intimately involved in the shaping of the design and appearance of the print. The rest of the conglomerate of human factors linked to the production of the print has been given less attention, if at all. Little is known about plate printers, publishers, financiers – and even less about materials suppliers, peripatetic print sellers, wives of engravers, or the boys and (some) girls carrying out odd jobs in the workshops. From Van der Stock's point of view it follows then that we need to look at the organisers of the print production in order to get a better overview of the historical printmaking world.

The issues underlying this study are the practical ways in which intaglio prints were produced in Western culture from its beginnings in the fifteenth century until today, and how technique expresses itself in the appearance of the print. By this I mean that the application of a particular technique makes an engraving look like an engraving and a mezzotint like a mezzotint, although not in all cases. Abraham Bosse (1645) thought the highest attainable technique in an etching was to make it look like an engraving.[12] Techniques such as crayon engraving and aquatint were invented and modulated in the eighteenth century, with the intention of reproducing the grainy lines of a crayon drawing and the washed tones in an ink drawing or watercolour.[13] Printing such plates with inks of the same colours as the drawing materials gave results that looked very much like the originals, as can be seen in the works of Cornelis Ploos van Amstel and Louis-Marin Bonnet. However, their prints were produced manually and the trained eye can discern the differences between them and the original drawings.

Obviously, lines drawn with a pencil or engraved with a burin have their own characteristics: a portrait drawn in pencil looks different from an engraved portrait. Engraver and audience are well aware of that, and the choice of a particular material or technique is therefore deliberate. What is new in the present study is that a complete overview is given of what is particular in the appearance of engravings and etchings in their rich variety of platemaking and plate printing processes through the past six centuries.

Technical and stylistic developments

We can observe an undulating but steady development of intaglio printmaking techniques related to styles of engraving and etching from the fifteenth century until the present. Technical developments grew into forms of detailed realism to be countered again by much looser ways of expression.

Dürer's copper engravings were praised by Erasmus for their naturalism and the printing plates found eager buyers after his death in 1528 (see Fig. 156, p. 175). The plates were reprinted again and again, but whereas Dürer's status as an engraver was unsurpassed, the work of Daniel Hopfer and other early etchers, although of a lesser standard, endured longer (see Fig. 51, p. 51 and Fig. 219, p. 277).

Cornelis Cort's introduction of the systematically swelling engraved line had been developed by 1565 via Hendrick Goltzius into the hyper-realism of Dutch Mannerists such as Jan Muller around 1600 (Fig. 1). This was countered by a deliberate coarseness and looseness in etching that culminated in the prints by Rembrandt van Rijn from around the middle of the seventeenth century. By the time of his death in 1669, the mezzotint process had been introduced. For the first time prints could be made showing a full and uninterrupted greyscale instead of tones built up by dotting or hatching (Fig. 2). Combined with Jacque Christoph Le Blon's trichromatic colour printing, the mezzotint process was applied successfully for making full-colour reproductions of oil paintings by 1720 (Fig. 3).

The crayon-engraving processes invented in France in the second half of the eighteenth century are perfect examples of how the skills of French instrument makers, copper engravers and plate printers combined to produce colour facsimiles of fashionable drawings and watercolours that amazed their contemporaries (Fig. 4). It was therefore questioned whether such works could still be called 'art' because they depended so much on the technical skills of engravers and printers, and derived so much from their originals. But, as J.H. Green already explained in 1804: 'It still remains with the Artist, to distinguish himself by the more meritorious part'.[14]

Subsequently Adam von Bartsch (1802) drew a distinction within the print world between the engraver working after someone else's design and the *peintre-graveur* himself etching his own designs: the former simply reproduced an existing image while the latter created an original artwork.[15] What Bartsch observed as an ideal became a firm reality in the nineteenth century.

The introduction of steel engraving just before 1820 (Fig. 5), the introduction of photography in 1839 and the mechanisation in printmaking created a divide between the printing trade and the artist-etcher. Theodore Fielding (1841) was the first to give instructions for both manual printmaking techniques and photography in one volume, but soon the two split.[16] Photography was introduced in the printing trade with the consequence that the design was no longer interpreted by the engraver because photography could reproduce any view in more detail and faster than a man. Consequently, the first generation of artist-etchers emerged in the 1860s, French and English etchers especially taking a strong position against photography, unimaginative steel engravings and the sterile products of the printing trade.

Graphic art vs. the printing trade

Fielding had already predicted this situation two decades before when he talked about 'all the evils arising from engraving on steel', by which he meant the extremely high edition numbers of top quality work sold at low prices. This put pressure on engravers to work for meagre incomes and increased competition between engravers, reducing their work to 'a capability of laying lines closer than others, to usurp the place of real talent. This is indeed an evil, and we are afraid that many years must pass away before the vitiated taste of the public can bear the works of real genius, unfettered by the microscopic finish of the present style.'[17] Typical of the artists of the Etching Revival of the 1860s is that they preferred the personal hand of the freely drawn line and the *non-finito* was appreciated, in this way answering Fielding's vision.[18]

With the invention of photogravure in 1879, the earlier photomechanical techniques for relief and planographic printing, designing and interpreting imagery became obsolete. Finally intaglio printing was completely mechanised around the turn of the century with the introduction of rotogravure (Fig. 6). The professional engraver disappeared into an anonymous existence in the printing industry. The artist-etcher had already spurned mechanisation: opting for manual techniques with personal expression, he associated in like-minded society and published instructions on his preferred working manner thereby fostering the Etching Revival and emphasising its exclusivity. For a while it even led to a hybrid genre of reproductive prints, whereby instead of using photography a reproduction of the orginal was made in the sketch-like manner of drawing of modern artist-etchers (Fig. 7).

The artist-etchers, in developing new ideas to counter mechanised print production and to thereby validate their own handmade prints, looked at the works by those they considered to be their predecessors, first and foremost Rembrandt.[19] The effects were twofold. One group of artist-etchers saw crisp black and white prints, and thought that clean-wiped impressions were the way etchings should be printed. The other group observed browned impressions and tonality in old prints. In mimicking the effects of browned oil-medium bled from the ink and of yellowed paper, they started to make their own inks, adding brown toners to black pigments and choosing old handmade papers for their printing. Tonal effects were created by the application of the then newly invented *retroussage* in wiping or, again with reference to Rembrandt, by the deliberate manipulation of plate tone. This led to debate between advocates of the clean-wiped print and those who supported ink manipulation, discussions that lasted until long into the twentieth century.

At the time when an etcher was expected to print his own plates, the emphasis on the craft aspects of printmaking in connection to art was so great that a number of printmakers ground their own inks, manufactured their own tools and presses, and even made their own paper. From this the idea arose that a print could only be original if the printmaker had made the plate and printed it. Mechanical and photomechanical techniques were therefore banned from manual printmaking for a while as they were seen as synonymous with reproduction and in conflict with originality.[20] Resolutions concerning original prints – issued in the 1960s and again in the early 1990s – stated that originality could solely come from the individual artist preparing and, if possible, printing the matrix himself.[21]

But then Pop Art and Photorealism introduced photographic elements in art again in the 1950s and 60s. In parallel, a revival of photogravure and other photomechanical forms of printmaking took place in the 1960s, the first steps were taken in digital printmaking and collagraph techniques became popular.[22] Following this, although in the first

instance not directly connected with it, was a growing concern with health and safety aspects in printmaking.[23] Awareness of these aspects stimulated the application of commercial photosensitive plates and films for artists' purposes, as well as the introduction of new kinds of materials and techniques in the 1980s and 90s (Fig. 8). Cheap digital cameras, computer equipment and image-processing software became available in the 1990s. This combined with the new printmaking materials available on the market and the whole resulted in the current wave of hybrid printmaking techniques with photographic links (Fig. 9).

Modern intaglio printmaking

In the following section, 'Working Method', I compare reading texts with 'reading' images and materials. Reading text is a matter of fact for someone with a lifelong training in reading and writing. Understanding other sources is less easy for many people because of lack of training, but it is precisely what visual artists offer. They communicate by means of visual systems that are very much their own. Concerning composition and iconography this may be clear. The role of technique here is that the artist or craftsman, in our case the engraver or printmaker, deliberately uses particular materials and handles them in specific (graphic) ways in order to communicate a particular message. This is largely based on habit, convention and tradition, but then the artist's personal 'handwriting' comes into play in the form of his choice and typical handling of materials. It gives an extra quality that makes his work stand out, going beyond that achieved by his predecessors.

This evolution is most apparent in the twentieth century when, based on nineteenth-century roots, the printmaker began to experiment more and more in order to create highly personal artworks. A typical exponent of the movement is Stanley Hayter, together with students and followers of the Atelier 17 that he and Joseph Hecht established in Paris in 1927. Combining profound technical knowledge with ideas from Surrealism, Hayter created a freedom of expression never seen before in the printmaking world (Fig. 10).

The traditional burin was combined with any possible etching technique, holes were drilled through plates, grounds were boiled on the plates and plates deliberately covered with semi-resistant etching grounds to create heavily textured surfaces; all things a 'classical' engraver would avoid at any cost. Colour application lost its barriers, and intaglio and relief inking were combined on one plate sometimes creating hallucinating effects. Prints were no longer confined to standard paper formats, three-dimensional prints appeared, and a print produced in just one copy became as valid as an editioned print.

Contemporary collagraphy and photomechanical processes, often in combination with digital techniques, changed the appearance of the intaglio print in the 1990s. The number of different working methods and the absence of academic codes led to an absence of major artistic movements. Anything is possible technically and anything goes stylistically today. The print competes with painting and sculpture, replaces wall paintings and reliefs, and is used in installations and performances, displaying its graphic qualities by making the most of its inherent technical possibilities.[24] Contemporary developments show that although the modern print can stand on its own independent of other media, the borders separating art disciplines are less defined and printmaking processes are mixed with other media. The search is on for new territories.

Working Method

> My ambition was to compile not merely a book of reference, but one which could be *read*.
>
> *Howard C. Levis*[25]

New printmaking methods do not appear just out of the blue – it is the combination of available materials and tools with a spark of genius that creates something new. From then on further progress is required in order to give the new technique existence and allow for the production of marketable prints. Again and again we have seen how material developments and lines of thinking converge towards a point when 'something new' must appear.

A good example is the etching technique. An etching requires technical knowledge in order to create a design in intaglio in a metal plate by means of the combined action of a corrosive chemical and a resist; next the plate has to be printed. Information on chemicals which bite iron objects and on acid-resistant materials was recorded around the year 800, although these were not combined to create imagery or decoration at the time. Five hundred years later a mordant and a resist were combined to etch an image in bas-relief in a Spanish steel sword blade, and the process was written down soon afterwards.

Engraving a design into a metal plate by means of a tool made for that purpose dates from pre-Christian times. However, only in the intaglio printing of an engraved plate with ink on paper in the 1430s did developments of ink and paper production converge into the unique idea of transferring ink that remained in the grooves of the plate onto a sheet of paper. For several decades the plates were printed by means of rubbing until a mangle was adapted to mechanise intaglio printing engraved plates by means of a roller press by the 1460s. Mechanised intaglio printing allowed for more homogeneous printing of engravings, longer print runs and in less time than by rubbing, offering fine quality work at an affordable price to a growing market.

Etching was employed on a larger scale for the decoration of iron tools, locks and armour in the last decades of the fifteenth century, when apparently there was an appetite for that kind of work and the requisite chemicals were available in large enough quantities. Therefore it comes as no surprise that the 'etched' printing plate appeared shortly before 1500. Both Daniel Hopfer and Leonardo da Vinci came around to the idea in the mid-1490s – Leonardo describing it in theory and Hopfer carrying it out in practice. Hopfer could draw his design in the etching ground easily, the etched line giving a free and unrestricted appearance to the print so different from the more precise engraved line. In addition, etching was much easier to master and less time consuming to perform, opening up opportunities for commercial print production.

Art technological source research

Developments such as these appear continuously and the aim of the present study is to record and describe them using art technological source research, ie the interpretation of 'sources' in order to better understand how art objects are produced.[26] There is a large variety of sources that can be used such as textual, audiovisual and material. In general terms, textual sources are documents containing texts, and audiovisual sources are documents containing images or sound recordings. Both are direct forms of communication, intended as such and understandable for the trained observer. Material sources are not made for direct communication and therefore require specialist knowledge and equipment to research them.[27]

My research has been based primarily on textual sources, more precisely practical works on engraving, etching and plate printing techniques.[28] All of these texts are printed or written in Roman script and date from the early sixteenth century to the year 2010. Texts in other scripts were not selected for the Bibliography of Practical Manuals because I am not sufficiently knowledgeable to be able to understand and interpret the contents of the texts properly. Texts on intaglio printmaking from before 1500 have not been found, although some of the earliest manuscripts described may have a fifteenth-century origin.

Images can provide information different from that provided by texts.[29] Many audiovisual media, such as photographs, slides, films, audio and video recordings, and internet resources have been consulted. But whereas written materials can be retrieved through bibliographies and catalogues, audiovisual materials are more difficult to trace because they are rarely catalogued.[30] A more exhaustive list of visual sources is therefore not included in this study.[31] However, pictures of printshops, equipment and recordings of procedures are used and amply illustrate the following text.

Furthermore, information is derived from material sources such as pigments, inks, tools, presses, workshops, and, of course, the prints themselves. Analyses of materials, handling of equipment, reconstructing recipes and techniques, or just being around in a printshop contribute experiences that cannot be gained in any other way.

Purpose and value of sources
According to Walter Prevenier, the purpose of sources, in the context of texts, is to provide information about the what, the how and the why.[32] In the case of material-technical subjects, the sources should be consulted for the materials to be used, how these materials should be handled, and why this was done. For example, an ink recipe may indicate what ingredients are needed, how to prepare the ink, and how to use the final product, as well as advising on the qualities of the product.

The next question is: where, when, and by whom is the source compiled? This question, says Prevenier, is of high importance, because every testimony is the story of an individual and the individual writes from his own background and experience.[33] In most cases manuals on intaglio printmaking were compiled by experienced practitioners. French author Abraham Bosse was a well-versed etcher and engraver, but not a professional plate printer. He added the chapter on printing to his 1645 *Traicté des manieres de graver en taille douce sur l'airin* on request from friends.[34] His information on the subject is nevertheless useful as a communication from a contemporary witness; in comparison with other sources, Bosse's discussion on the subject has proved to be accurate and detailed.

Alex Roland states that 'publication is the only mechanism of scientific advancement. Technology, in contrast, is papyrophobic. Practitioners prosper by keeping their secrets to themselves, passing on knowledge through apprenticeship, limiting the spread of information through guild restrictions, and preventing at all costs the publication of their techniques.'[35] Such rhetoric is hardly applicable to intaglio printmaking, as the many hundreds of titles in the

Bibliography of Practical Manuals demonstrate. True, it took more than two centuries from the appearance of the first intaglio prints before Bosse published the first monograph on intaglio printmaking, but by then the techniques, materials and tools he mentioned were not uncommon. They had been known for centuries used in conjunction with other disciplines. Anyone walking into an engraver's studio or a printshop could see how it was all done. The quality of the finished product is therefore related to the skill of the craftsman in handling the materials and the insight of the artist creating the object.

Roland is right, however, concerning particular working methods. The difference between Ludwig von Siegen with his mezzotint technique and Jan van de Velde IV with his aquatint technique – both of whom for a while lived in Amsterdam, perhaps even at the same time in the 1640s – is that unlike Von Siegen, Van de Velde did not communicate his invention.[36] Consequently aquatint had to be reinvented a century later when mezzotint had already flourished for many decades.

Basically, a source is an information carrier. Any source may be valuable for research, but its particular value is related to its availability, to the research project for which it is used and to the capacities of the researcher using it. We can draw information from many sources, but its value is related to our knowledge of handling and understanding the information contained within the source. We may and should cast our nets wide, but the catch and the quality of the catch is limited to the sources available and our personal capacities.

Cooperation between specialists in different fields is therefore a *condicio sine qua non*. This requires mutual respect and understanding between the cooperating partners, and demands high communicative skills from everyone involved. It sounds idealistic, but is pragmatic and the only way to achieve unambiguous results.

Textual sources

From antiquity to the present, people have compiled collections of recipes. Rosamond Harley divides them into three groups: (1) those containing miscellaneous information of unknown origin; (2) those with extracts from printed books; (3) those of known authorship.[37] Examples for intaglio printmaking include: (1) manuscript 64 (first half of the sixteenth century) in the Museum Plantin Moretus, Antwerp, which contains an etching recipe and a remark about Frankfurt black, the pigment used for intaglio printing ink;[38] (2) Jacoba van Veen's copy of Gerard ter Brugghen's *Verlichtery kunst-boeck* in her manuscript on various art techniques (1650–1660), including the recipes for etching and printing ink;[39] (3) and the well-known notes on art techniques (1620–1648?) by Theodore Turquet de Mayerne, compiled through his own observations and his discussions with the artists whose studios he visited.[40]

All printed publications started their lives as manuscripts and appeared edited by authors and publishers. A small group of manuals on intaglio printmaking was published posthumously, however, and those recently published usually take the form of a study with an introduction or comments by the editor of the deceased author's text.[41]

This raises the question as to for whom manuals on intaglio printmaking were written. Both Bosse (1645) and Seibold (1909) give good examples. Bosse dedicated his work not to an influential patron, but to the amateurs of this art, asking his professional colleagues for comments (suggesting they will read his text).[42] The Austrian professor of etching Alois Seibold intended to share his experiences with curious young people.[43] Manuals often refer to intended audiences and the three main groups for which they are said to be written are students, print lovers and printmakers.[44]

Instructive and descriptive

At this point a distinction should be made between 'instructive' and 'descriptive' texts, as well as images. 'Instructive' relates to working practice, while 'descriptive' relates to observation and later studies of older sources. These two types of works represent two distinct genres in art technological, in particular print, literature: instructive manuals on the one hand and descriptive reference works on the other. Although concerned with the same subject, printmaking techniques, these genres have led separate lives since the seventeenth century. They represent two different approaches to printmaking, the one aimed at the image maker by giving practical instructions and the other at the consumer of the image by elucidating how things are done.

The first genre of technical references was already well developed by the time of Bosse's treatise. Earlier examples of the second genre exist, but it only developed more clearly in the eighteenth century, such as in the items on printmaking for the large encyclopaedias that became fashionable then. The book by Alfred de Lostalot (1882) explaining techniques to the amateur and collector of prints is definitely descriptive (see Fig. 258, p. 318).[45] The difference between descriptive and instructive texts is commonly shown by the use of the imperative in instructive texts: do this, do it like that. An author of an instructive text directly addresses the reader, while the author of a descriptive text keeps his distance.

Terminology in particular is a complex field. Arie Wallert discusses the interpretation and translation of terms, and how 'important technical sources can be hidden in the guise of ephemeral or casual remarks'.[46] Terms need to be defined and should not be taken for granted. Homonyms and synonyms, as well as translations can cause confusion.

There is also a danger of circularity. Modern researchers base translations of difficult passages on their knowledge of the historical processes, yet this knowledge is in part derived from reading translations of historical texts.

The importance of practical treatises
According to Frans Janssen, working in the field of book history, the role of technical manuals on typography in the transmission of that discipline should not be overestimated.[47] This is proved different in intaglio printmaking. Historical references to technical manuals on intaglio printmaking, together with provenances, owners' marks and traces of use in surviving copies, testify to the presence of technical manuals in engravers' studios from the seventeenth century up to the present day; most prominent are the references to Bosse's manual.[48]

This might suggest that the average copper engraver was a different, perhaps a better educated or more intellectual person than the average book printer (or plate printer). On the other hand, manuals disintegrate through use or neglect, become outdated, or are loaned and disappear. This means that most copies of historical manuals that have come down to us are those that found their way into book collections shortly after publication and therefore have undergone less use and general wear and tear.

Craig Hartley, in a review of a manual on printmaking techniques, stated that 'print scholars would do themselves no harm by witnessing the ingenuity that has gone into many of these processes; perhaps it brings us closer to the coalface of creativity and helps us understand Beccafumi, Rembrandt, Picasso'.[49] First, Hartley highlighted how little knowledge most modern art historians have of printmaking processes. Secondly, he explained that print scholars approach prints and printmakers by concentrating more on theoretical aspects. Thirdly, he sketched the current growing interest in art technology by art historians.

Personal experience of printmaking techniques gives a 'tactile' understanding that cannot be learned from any book. Instructive manuals and articles on intaglio printmaking reflect the knowledge at the time of publication concerning material-technical aspects, but such knowledge remains an abstraction until one starts practising the technique. Practical experience can only be gained by handling tools, machines and materials personally. Neuro-muscular (eye–hand) coordination is essential, observation must be trained, a feeling for aesthetics is necessary, as are the intellect for understanding what one is doing and, of course, perseverance, because nothing can be gained without hard work. Awareness of traditions and cooperation with others cannot be ignored, because nothing or no one stands on its own. And finally there is deliberation – contemplation of the final product.[50]

Audiovisual sources
Writing is one of the main means of communication, but images can explain material things in a different and more comprehensible way. The German 1641 edition of *Piazza universale* by Tomaso Garzoni has a paragraph on engraving and printing. The text briefly mentions some details about ink and printing, but for the rest refers to the illustrations showing how engraving and printing are carried out (Fig. 11).[51] That is the idea of illustrations, of course, to show how things look and how techniques are performed, because any textual description is limited.

Usually hand-drawn images of tools and studio interiors contain realistic elements, although they should not be seen as photographic records. But even photographs of workshops are often staged not very differently from earlier manual depictions (Fig. 12).

In general, sixteenth-century pictures of workshops are allegorical, in the seventeenth century they become more genre-like and in the course of the eighteenth century they attain a factual character, although still ideal in concept. By mutual comparison of images, by comparison with descriptions and inventories of workshops, and by modern reconstructions, realistic elements can be distinguished from the more fantastic.[52]

All authors intend to describe and depict the ideal situation, ie how things are done properly and how objects should be made, which raises the question as to what is the value of pictures of engravers' and printers' studios to our research.[53] Over the centuries we can see different ways of representing printmakers at work, moving from emblematic to genre and from idealistic to matter of fact. The present study concentrates on actual working environments, techniques, and the tools and machines used in producing engravings and etchings. To that aim, facts are filtered out from fictitious and ideal representations by mutual comparison, studying contemporary textual sources and by reconstructions. This leaves us with a fair idea of what workshops, tools and machines may have looked like and how they developed over the centuries.

On the whole details are realistic enough to get a view of the historical working environment. Photographs bring us closer to reality; the first photographs of intaglio printshops date from the 1890s.[54] The first manuals illustrated with detailed photographs of tools, materials and presses were published in the 1930s.[55]

As the nineteenth century brought still photography and eventually moving pictures, the twentieth century ushered in possibilities for audiovisual recording. In 1985, Dutch radio and television stations broadcast a course on printmaking called *Grafische technieken*. A student's book plus a teacher's manual accompanied the course and the broadcasts are also available on audio and videotape.[56] More illustrated manuals are now published than ever before but speech and gesture is the oldest, most used and still the most effective means of communicating information.

With this goal in mind, Henrik Bøegh released an instructive video (2000) in conjunction with his book in order to show and demonstrate all the new tools and techniques recently introduced.[57]

Oral communication and hands-on demonstrations of how things are carried out is the manner by which the master educates his pupil in a direct way. This is how tradition has come down to us – by teachers who taught students who became teachers in their turn. A reflection of such an audiovisual source can be seen in the manuals written by Stanley Hayter and his friends, followers and students.[58] Hayter's methods influenced his students who published their own manuals, teaching students who in their turn produced their own manuals and so on. Such a pedigree is different from Bosse's treatise and all its editions, translations and facsimiles, because in Bosse's case information is passed on indirectly.

Material sources

The object under study – the print in our case – is a primary material source containing direct information about its production, but it takes specialist knowledge to be able to 'read' the object.[59] Figure 13 is the etched title page of the second volume (1595) of the book on designs for fountains and chimneys, based on the five architectural orders, by Wendel Dietterlin the Elder. Close observation of the page shows that Dietterlin prepared one plate and cut out the ovals with text at the top and bottom. The larger plate without the ovals was inked in black; the ovals were inked separately in red and placed within the black plate. The whole was run through the press in one pass, resulting in an impression in two colours and is thereby an early example of a colour 'jigsaw' print.

Dietterlin's print has an extra feature, however. There is a shadow cast by the hand holding the palette, indicated by some hatching, in the lower oval plate. The rest of the oval is inked in red, but the hatching is inked in black; such a combination of two (or more) colour inks on one plate is called *à la poupée* inking. What makes this a typical example of a material source is that there are no contemporary descriptions of intaglio colour printing: these appear only in Bosse's 1645 treatise, while *à la poupée* printing itself was not described until the book's third edition of 1745.

Other kinds of material sources are machines, tools, materials, workshops and sites. Handling historical tools and machines, or reconstructing materials, can give an idea of how the original may have looked like, behaved or was operated. The workshop shows the working environment, layout, furnishings, heating and lighting conditions. A 'site' is the area in which the workshop is or was located. Even if there are no remains left, worthwhile information can still be drawn from its position related, for example, to a river (transport, communication, energy, water, food) or street (neighbouring artists and craftsmen, societies, relatives) that places it in its spatial, social and economic context.[60]

Aspects

The 'aspects' of a source, in the sense of point of view, indicate how a researcher may look at and use the source. For example, social aspects are present within workshop practices, which could be a master-apprentice or teacher-student relationship, workmen could be companions, or husband and wife could work together. Other aspects to be considered are politics or religion. For example, when trade routes are temporarily cut off or rerouted because of wars or conflicts this results in higher prices of materials due to supply interruptions, not taking into account the resultant consequences for production and marketing. There were also the normal taxes to be paid on import and export. Designs for devotional imagery are for the most part dictated by religious obligations and interpretations.

Historiography

The history of the print has seen many studies, but less so the history of the making of the print. Print scholars rarely go into practical details. They will describe engraving, but say little or nothing about the shape of the burin or the choice of its steel. They will say that the print is coloured, even printed in colours, but not which pigments were used or who produced the inks. On the other hand, authors of practical manuals on printmaking may devote a few words to their predecessors, but any coherence between the techniques described in the instructions and historical developments is usually absent.

The following historiography sketches an overview of the various genres in studies on printmaking. A number of these publications discuss printmaking techniques in general, or explain about etching and engraving in particular. The majority deal with the concept of the print, the history of the print, engravers and artists. Technique, if mentioned, is an additional chapter and only occasionally related to theoretical or historical issues.

Pioneers

Giorgio Vasari, in his discussion on the presumably Italian origins of intaglio printing in the second edition of his *Vite* (Florence 1568), described how he thought the Florentine goldsmith Maso di Finiguerra invented the technique.[61] It took almost three centuries before Carl Friedrich Von Rumohr (1835) could counter this claim, and another 75 years before Max Lehrs and Max Geisberg published their studies on the beginnings of intaglio printmaking in greater de-

tail.[62]

When John Evelyn wanted to publish his *Sculptura, or the History, and Art of Chalcography and Engraving in Copper* (1662), the first monograph on print history, he had intended to add a complete translation of Bosse's treatise as an introduction to printmaking techniques for his readers.[63] He only refrained from this part of the project when he heard that William Faithorne was preparing the same, giving way to the expertise of this professional engraver.[64] The difference between Faithorne and Evelyn was that Faithorne intended to publish a practical treatise for the engraver and etcher – he literally uses the word 'practice' on p. [5] – while Evelyn's approach was encyclopaedic and more philosophical. Although it concerned the same text, Evelyn's concept was different, as he wanted to add a reference work to his discourse introducing technique to those less familiar with the material aspects of printmaking, not a 'how-to-do manual' like Faithorne's translation.[65] With this intention Evelyn read the part on printing to the Royal Society on 14 May 1662.[66] The manuscript disappeared into the archives of the society and Thomas Bell published this chapter only in 1906 as the second part to a reprint of Evelyn's *Sculptura*; again not with the idea of publishing a practical manual, but from an historical point of view.[67]

Filippo Baldinucci paid some attention to the material-technical aspects of printmaking in his *Vocabolario toscano dell'arte del disegno* (1681). For example, when explaining about intaglio printing, he distinguished between the inks used in Italy and in France, and he gave information on dampening paper.[68]

Technical details appear more frequently in the literature on the history of prints following these pioneers. The first to give a thorough overview of the processes of intaglio printmaking, woodcutting and lithography was Adam von Bartsch (1821).[69] He did so because he considered that the student of the print needed to know by what practical methods a print is made.[70]

Evelyn's literary heir, Joseph Maberly, published the second edition of his *Print Collector* (1880) including the integral text and the plate illustrating the engraver's tools from Theodore Fielding's treatise of 1841 (see Fig. 166, p. 183).[71] Such publications did turn into richly illustrated works with an introduction on technical matters in the course of the twentieth century, as for example Arthur Hind's *History of Engraving & Etching*.[72]

Monographs and journals

A number of monographs and trade journals with an emphasis on the description, rather than on the instruction, of printmaking techniques, sometimes with added historical information, appeared from around the 1830s. One of the earliest, the *Journal für Buchdruckerkunst* (est. 1834) was detailed in technical instructions and contained some specimens of intaglio printmaking. Herman Hammann in his study *Des arts graphiques destinés a multiplier par l'impression* (1857), explained a large number of printmaking techniques practised up to that time.[73] More publications of this kind followed, often illustrated with specimens of the techniques described such as Alfred de Lostalot's *Les procédés de la gravure* (1882).[74] In particular, nineteenth-century printers' magazines such as *The Art-Journal* (est. 1849) and *The Printing Times and Lithographer* (jointly published since 1874) were lavishly illustrated with specimens of the latest processes. Otto Krüger's *Die Illustrationsverfahren* of 1914 has detailed descriptions of the more common graphic techniques of his day with 74 specimen plates added after the text (see Fig. 6), while the second edition of 1929 has 90 specimens.[75] As late as 1934 Degaast & Frot published their *Les industries graphiques*, an overview of printing and printmaking techniques including many specimens, but theirs is the last in its genre.[76] More recent publications of this type contain reproductions only.[77]

Encyclopaedias

Baldinucci approached intaglio printmaking in an encyclopaedic manner in his *Vocabolario* and many encyclopaedias appearing in the following centuries devoted attention to etching, engraving and intaglio printing. Informative articles on intaglio printmaking techniques were published in Diderot & D'Alembert's *Encyclopédie*. The article 'Gravure' in volume 7 (1757), written by Claude Watelet, is based on the third edition of Bosse's treatise, as is the article 'Imprimerie en taille douce' in volume 8 (1765). The article 'Gravure en couleurs', describing Jacque Christoph Le Blon's technique of three- and four-colour printing, is an abridged version of part two of Le Blon's text edited by Antoine Gauthier de Montdorge.[78]

The larger eighteenth-century encyclopaedias contain detailed technical information. They were, however, describing crafts and were not intended to provide instructions for the artist or craftsman. Such publications were meant for the educated and affluent purchaser, but prohibitively expensive for the common workman.[79] Nevertheless, unbound quires found today may indicate that loose quires circulated at the time; alternatively authors could study copies in libraries.[80]

Special encyclopaedias on printing and printmaking appeared in the second half of the nineteenth century, such as the works by John Ringwalt (1871) and Alexander Waldow (1884).[81] Many such dictionaries, encyclopaedias or lexica have appeared since then. Their contents usually concentrate on typography, with some information about intaglio processes. The *Encyclopedisch handboek der graphische werkwijzen* (1926) by Nicolaas van Huffel is an example of an encyclopaedic work on printmaking only, discussing techniques and history of both manual and artistic as well as

(photo)mechanical processes.[82] The latest of this kind is the *Encyclopedia of Printing, Photographic, and Photomechanical Processes* (1989–1990) by Luis Nadeau, with references to more than 1500 processes.[83]

Specimens
Technical treatises sometimes contain 'specimens' of the printmaking techniques described.[84] From the aspect of research specimens are interesting because they elucidate the methods described unambiguously. Bosse illustrated his treatise (1645) with all plates drawn with the *échoppe*, the special etching needle with an obliquely cut tip he discussed in his treatise (see Fig. 179, p. 199). The plates illustrating etching and engraving were used for the following French editions and new plates were added. With the third edition of 1745, a specimen of mezzotint, and with the fourth edition of 1758 (= 1769) a specimen of crayon engraving were added.[85] Another reason why Evelyn's book (1662) is important to us is because not only is it the earliest publication with a reference to the mezzotint technique, but he also arranged for Prince Ruprecht to make a specimen of the new invention especially for it (Fig. 14).[86]

Specimens of etching on steel and of the various aquatint recipes in the form of strips showing tonal values appear frequently in the first half of the nineteenth century (Figs 15 and 16).[87] These are all intended as pragmatic samples and have no artistic intentions. Other handbooks illustrated the methods described with artistic plates made for the purpose, such as August Delâtre's manual (1877) with a soft-ground print by Félicien Rops to accompany his letter on the soft-ground process.[88] Towards the end of the century the first manuals appeared with photomechanical reproductions of prints, but a number of publications still kept original etchings as frontispieces and illustrations.[89] Later editions of these were also illustrated with the same etchings, but from Levon West's *Making an Etching* of 1932, new manuals were illustrated with reproductions only (Fig. 17).[90]

Recognising printmaking techniques
A recurring theme in twentieth-century art history and conservation is how to recognise the various printmaking techniques in the prints themselves and how to distinguish between them. Such information is especially useful for print collectors, conservators and curators.

One of the earliest monographs of its kind was compiled by printmakers of the Print Society. Their *How to Distinguish Prints* (1926) describes manual intaglio and relief printmaking processes, illustrated with colour reproductions of prints and photographic enlargements of technical details.[91] Classic is *How Prints Look* by William Ivins (1943). In the words of the author, it 'is an elementary introduction to the appearances (the outward and visible signs) of prints'.[92] Another is Felix Brunner's *Handbook of Graphic Reproduction Processes* (1962) with trilingual texts and many detailed photographs.[93]

Reproductions of specimens are helpful in the study of printmaking techniques, but they can be confusing, because first one observes the technique used for the reproduction, then that observation has to be adapted to the level of the original. For this reason digital pictures are not very helpful either, because one is looking at conglomerates of pixels at a computer screen that have to be interpreted in order to understand what is reproduced and even pixel-less screens are too fuzzy for the purpose. To overcome this difficulty some publications with samples of originals are available. Alfons Fiedler's *Graphik Vergleichs-Sammlung* (1978) and Günther W. Schwarz's *Graphik, eine Dokumentation der Techniken mit Originalen* (1995) display a large variety of techniques by means of specimens; these publications are useful for didactic purposes.[94]

Where the publications of Fiedler and Schwarz are more like collections of existing older materials, other authors produced new material especially for the publication. *Techniques in Etching Using Brass* (1983) by Paul Smith is a technical treatise published in an edition of 30 only, with every technique illustrated with an original print.[95] Marion Mudde produced singlehandedly a manual (1987) on intaglio printing with 40 impressions per volume in an edition of 100.[96]

Some modern authors have published sets of specimens of printmaking techniques. Well known in the genre is *101 Prints* by Norman Eppink (1971). Eppink created 101 prints in about eighty techniques, giving short explanations about the processes displayed including some historical information. The original work was produced in an edition of fifteen; the trade edition has reproductions only.[97]

Bibliographies of monographs
The kind of manuals for the engraver and etcher that form the basis of the present study are found in hundreds of literature lists, and nearly every author of a handbook on etching and engraving published after Bosse's 1645 treatise refers to his predecessors, foremost to Bosse. Maberly's *The Print Collector* (1844) is one of the very first works with an art historical character to pay special attention to technical treatises on printmaking.[98]

Some modern studies on the history of printmaking, such as that by Lilien and Gerhardt (1978), Rolf Stümpel (1980) and Eva Figueras Ferrer (1992) contain lengthy lists of practical handbooks, which are more or less selective enumerations of titles, but they are not indexed.[99] In comparison, the value of bibliographies is that they are compiled methodologically. The material is ordered according to defined selection criteria, usually with annotations to the titles and indices disclosing the content of the works described, in order to place them in a larger context. The following bibliographies specialise in

publications on printmaking processes.

The *Bibliography of Printing* by Bigmore and Wyman (1880–1886) deals with typographic printing in general, with references to some works on intaglio printmaking.[100] The first study with an extended chronological bibliography of manuals on etching and engraving techniques is *Etching, Engraving and the Other Methods of Printing Pictures* by Singer and Strang (1897).[101] In the introduction they write that 'it is for the greater part based, not on the handling of the books themselves, but on printed notices of them. Perhaps it will some day be found satisfactory as a foundation upon which somebody may construct a true bibliography.'

Their wish was answered by Howard Levis 15 years later. After a first exercise, *American Books Relating to Prints and the Art and History of Engraving* (1910), he published his *Descriptive Bibliography of the most Important Books in the English Language Relating to the Art & History of Engraving and the Collecting of Prints* in 1912, with a supplement in 1913.[102] Writing from his own collection he covered all aspects of printmaking published in English up to the year of publication. Another bibliography can be found in *On Making and Collecting Etchings* (1920). Although modest, it is of interest in the present context because the briefly annotated titles are presented chronologically and it has a subject index.[103]

The next bibliography of importance is *Printmaking & Picture Printing: A Bibliographical Guide to Artistic & Industrial Techniques in Britain 1750–1900* (1984), compiled by Bridson and Wakeman.[104] Its title descriptions are annotated and concentrate on 'artistic & industrial techniques in Britain 1750–1900'. The materials discussed are again published in the English language, but of special interest is the large number of articles in journals that the authors describe. I published my own *Bibliografie van de techniek van de manuele diepdruk* concerning practical handbooks on manual intaglio printmaking in Roman script throughout all periods in 1986.[105] The most recent general bibliography on printmaking, *Bibliografía del arte gráfico: grabado, litografía, serigrafía, historia, técnicas, artistas* (1994), written under the supervision of Javier Blas Benito, is an extensive thematically ordered list of short titles related to everything concerning prints and printmaking.[106]

Bibliographies of articles

Articles published in periodicals are seldom referred to in bibliographies because they are more difficult to find than monographs. Some nineteenth-century authors on prints and printmaking included references to articles.[107] Poole started to issue a general *Index to Periodical Literature* inclusive of articles on printmaking in 1848, which was followed by more specialised indices.[108] Bridson and Wakeman were the first to publish a bibliography on printmaking that paid due attention to articles as mentioned.

It was only later in the second half of the twentieth century that libraries began cataloguing articles next to books. Indexing articles is usually carried out by specialised institutions and categorised by subject, such as sports, nutrition or physics. References to articles on practical subjects are rarely found in art historical reference works and bibliographies, an exception being the *Art Index*.[109]

The publication of articles on printmaking techniques began in the second quarter of the eighteenth century with references to Le Blon's manner of colour printing in 1721, 1722 and 1731, and the polemics between Gautier-Dagoty, De Montdorge and Robert from 1748 to 1756. The articles are actually letters to the editor, but they provide insight into technical matters concerning intaglio colour printing according to the system of Le Blon in the middle of the eighteenth century.[110]

Many eighteenth- and nineteenth-century articles are copies, reworked versions or translations after earlier publications. Typically the American magazines *The Franklin Journal* and *American Mechanics' Magazine* republished everything issued in European magazines that could be useful for the United States. This shows the level of dissemination of information at the time and ensures that the present Bibliography of Practical Manuals covers the subjects of main interest to the contemporaneous audience, even if only a smaller part of the articles published then was seen by me, because the same information was republished in different journals.

By the later eighteenth century, magazines aimed at stimulating industry in general, such as the *Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce* (est. 1783) and the *Annales de chimie et de physique* (est. 1789) were followed by specialised journals for particular disciplines. In the nineteenth century, the separation between the printing trade and the graphic arts is expressed by different magazines such as the English *The Art-Union* (est. 1839), later *The Art-Journal* (est. 1849) and after that *The Magazine of Art* (est. 1878?), where publications on printmaking techniques can be found, and magazines for the printing trade such as *Journal für Buchdruckerkunst* (est. 1834) and *The Printing Times and Lithographer* (since 1874). Bridson and Wakeman's abovementioned bibliography refers extensively to these magazines.

Between 1890 and 1990, articles on the techniques of intaglio printmaking were largely aimed at amateurs and schoolteachers. Of the journals for printmakers that are issued now, the English magazine *Printmaking Today* (est. 1991) has a large international coverage in the English-speaking parts of the world. The Spanish magazine *Grabado & edición* (est. 2006) covers Spain, Portugal and South America. The quarterly *Hanga-Geijutsu* (est. 1973) is published in Japanese and 'Printshow International' is an Italian e-zine (online since January 2002) with an international scope.[111]

Societies of print collectors and of printmakers tend to issue newsletters for their members, also including articles on technical issues.[112]

My Bibliography of Practical Manuals covers all monographs on intaglio printmaking processes in every language published in Roman script from 1555 to 2010. This range goes beyond that of any of the earlier bibliographies of its kind. The number of journal articles exceeds those published by Bridson and Wakeman because it extends beyond their discussion on the beginning and end of the period and because it is not limited to the English language only. Above all, this bibliography is the first to describe a substantial number of manuscripts written over a period of six centuries – from notes in the margins of printed handbooks, through odd recipes for etching grounds and printing inks, to monographs.[113] All this combines to make the bibliography more complete than any of its predecessors on which it continues.

Studies in the history of printmaking techniques

It was in 1828 when the *Nürnberger Kunstverein* raised the question as to whether 'the old painters and engravers used the same instruments as are used nowadays'. Johann Andreas Börner's answer was published only 35 years later as a *Beitrag* to the *Archiv für die zeichnenden Künste* (1863). Incomplete as it may look to us now, Börner's publication was the first to give an elementary overview of the various tools and materials used in the history of intaglio printmaking.[114]

Among the few historical studies on material-technical aspects of printmaking is the series of four articles on 'The origin of the printing and roller presses' (1941) by Henri Meier.[115] *Geschichte der Druckverfahren*, a summary history of intaglio printmaking techniques by Lilien and Gerhardt, appeared in 1978.[116] Otto Lilien also unveiled in detail the early history of three- and four-colour printing in his *Jacob Christoph Le Blon, 1667–1741: Inventor of Three- and Four-Colour Printing* (1985).[117] Fons van der Linden gave a general exposition on the history of typographic and printmaking processes in his *Grafische technieken* (1979), including a chapter on manual intaglio printmaking.[118] Basil Hunnisett published his reference work *Steel-Engraved Book Illustration in England* in 1980, followed by *Engraved on Steel* for the rest of the world in 1998.[119] Other single-process studies covering the subject from both an historical and technical perspective are *The Mezzotint* (1990) by Carol Wax, *Aquatint* (2007) by Christiane Wiebel, and *Schwarze Kunst* (2009) by Hanebutt-Benz and Fehle.[120] Antony Griffiths published his articles on early aquatint and mezzotint together with many other gems related to the history of intaglio printmaking techniques in *Print Quarterly* from the middle of the 1980s onwards.[121]

Looking at publication dates, the interest for historical studies concerning material-technical aspects of particular elements of printmaking began to increase again around 1980. My study builds upon and continues this development by covering the whole field of manual intaglio printmaking processes from its beginnings in the early fifteenth century until today, both in general and in detail. Although its starting point concerns material-technical aspects, it also includes the antecedents of materials and processes, trade and supply of materials, deals with economic, education and social aspects, and sketches the dissemination of intaglio printmaking in Europe and from there throughout the world during six centuries. All of this has rarely been touched upon before in works of its kind.

The sheer number of primary sources and secondary literature, the kinds of works and the languages covered by the bibliography, in combination with the visual and material sources researched, warrants a more thorough foundation for a study of this kind than could have been possible before. Questions left unanswered by earlier authors due to the lack of documentary information are addressed here. At the same time, the overall view highlights the gaps in our knowledge thereby opening up opportunities for future research, the main issues being economic developments and professionalism. Each section contains a generous number of essential references that can be used as the starting point for the further study of particular topics.

Conclusion

The history of the print basically is a history of printmaking techniques. Concept, composition and format may have been agreed upon in advance of the actual making of the print. The selection of materials and the choice of working methods, in combination with technical decisions made during the production process, not forgetting the 'handwriting' or 'ductus' of the creator, define the outward appearance of the final product. However, change one element and the work will look different. Any research into printmaking, its concepts and historical developments as well as the prints themselves is therefore dependent on knowledge of its material-technical aspects.

Notes

1

Carroll 1871: 78–79.

2

For an elaborate discussion on style see: *Neckenig 2010*: 87ff.

3

The present study is supported by references to over 1500 primary textual sources in the form of printed and written practical manuals and articles on printmaking techniques; about 500 depictions of studio interiors, machines and tools; the actual handling and study of many tools, presses and materials; reconstructions of historical materials; scientific analyses of paper, printing inks and pigments. The whole is backed up by another 1500 references to modern literature. See Literature, p. 605 and Appendix 4, p. 431.

4

Hind 1963.

5

Charles Morgan suggested compiling chronologies for keeping the historical overview when my study was still in its infancy, a suggestion that proved to be very helpful indeed. For a compilation of the tables see Appendix 1, p. 405.

6

Wer aber in Künstlerwerkstätten verkehrte, mußte die Erfahrung machen, daß überhaupt zwischen den hier tätigen eigentlichen 'Fachleuten' der Kunst und den Historikern der Kunst eine tiefgehende Trennung bestand, begreiflich, da in den zwei Lagern in ganz verschiedener Sprache über die gemeinsame Angelegenheit gesprochen wurde; Wölfflin 1941: 1 of the introduction to the volume.

7

Hind 1963: 3.

8

Parshall & Schoch 2005: 29.

9

Raymond 1909: 64.

10

Stangos 1980: 10.

11

Van der Stock 2002.

12

Bosse (Paris 1645): 3 pl. 8.

13

See Chapter 3, pp. 191 and 209.

14

Green (London 1804): V.

15

Von Bartsch 1802–1821, vol. 1, (1802): iv.

16

Fielding (London 1841).

17

Fielding (London 1841): 30–31.

18

Tedeschi adds a further argument to the claim of English artist-etchers for exclusivity by distancing themselves from amateur etchers; *Tedeschi 2008*: 26–27, 30–33.

19

Tedeschi 2008: 34–36.

20

Exceptions are some artists active in Paris by the end of the nineteenth century, such as Félicien Rops, and George Rouault around 1920. A number of their etchings began as photogravures after drawings, after which they reworked the plates with etching and drypoint techniques. See Chapter 3, p. 231. More artists worked after photographs, drawing on their plates after the photographic image, such as Anders Zorn.

21

Denison (London 1895): 92; **Paton** (London 1895): 107; **Profit** (Paris 1913): 101–106; **Rhead** (London 1890): V. This was underscored by resolutions from conferences on printmaking in Vienna in 1960, New York (Print Council of America, *What is an Original Print*?, 1961), and of the Comité National de la Gravure Française on 18 December 1964; **Brunsdon** (London 1965): 11–12, with the text of the resolution of the Third International Congress of Artists, Vienna, September 1960; **Paglialonga** (Pescara 1985): 154, with the text of the resolution of the Comité national de la Gravure Française of 18 December 1964. See also: *Gilmour 2008*; *Hayter 1975*: 123–135; *Koschatzky 1972*: 25–38; *Van der Linden 1992*; *What 1993*; *Winkelman 1991, 1995-1, 1995-2*.

22

Edmonson (New York 1973): 63–64, 73–74; *Gilmour 1986*: 35–36; *Lovejoy 1981*: 40, 46, 49, 51; **Peterdi** (New York, rev. ed., 3rd printing, 1973): xxiv, 248.

23

D'Arcy Hughes & **Vernon-Morris** (2008): 9–10; *McCann 1979*: 155–188.

24

For some studies on recent developments in printmaking see: *Coldwell 2010*; *Elliot 2011*; *Kim 2007*; *Noyce 2006, 2010*; *Saunders & Miles 2006*. For a discussion on contemporary developments in printmaking see: http://printshow.wordpress.com/2010/09/17/interview-with-richard-noyce/ (2010). The 'im:print' conferences offer a forum on the current state of printmaking; *im:print 2010*; *im:print 2011*.

25

Levis 1912, Supplement (1913): 6.

26

Clarke et al. 2005; *Kroustallis et al. 2008*; *Hermens & Townsend 2009*; *Eyb-Green et al. 2012.*

27

For a more detailed discussion on the subject see: *Stijnman 2008, 2012-1.*

28

See Appendix 4, p 419.

29

Stijnman 2009-2, 2010-2, 2010-3.

30

An exception is: **Heller** (New York, 2nd ed., 1972): 332, with a list of 'films related to prints and printmakers'.

31

The Bibliography of Practical Manuals (Appendix 4, p. 419) mentions audiovisual media in a few cases where they accompany printed publications, publications, see 'Audiovisual sources' below. An exhaustive, annotated and fully illustrated bibliography of audiovisual sources on intaglio printmaking is a *desideratum* for future research.

32

Prevenier 1992: 19. For a discourse on historiographic methods applied to art technology see: *Clarke 2008*.

33

Prevenier 1992: 94.

34

Bosse (Paris 1645): 57.

35

Roland 1992: 660.

36

Von Siegen taught others the mezzotint technique, although this was 15 years after his invention of the process; *Hanebutt-Benz & Fehle 2009*: 101. For Von Siegen see Chapter 3, p. 191. For Van de Velde see Chapter 3, p. 213.

37

Harley 1969: 1.

38

Printing ink recipe (Southern Netherlands 1501–1525).

39

Brugghen (Den Haag 1650–1660).

40

Turquet de Mayerne 1 (London 1620–1646); **Turquet de Mayerne 2** (London 1620–1646).

41

Hecht (1994); **Holleman** (Utrecht 1927); **Hollenberg** (Ravensburg 1962); **Le Prince** (Paris 1780); **Stauffer-Bern** (Dresden 1907); **Tempesti** (Fiorenze 1994); **Zonca** (Padoua 1607).

42

Bosse (Paris 1645): [3]–[5].

43

Seibold (Esslingen, 3rd ed., 1922): [5], preface to the first edition.

44

In case found, the annotations to the title descriptions in Appendix 4 for which audiences the publications are intended.

45

De Lostalot 1882.

46

Wallert 2005: 47.

47

Janssen 1986: 11–12.

48

For further discussion see Appendix 4, p. 419.

49

Hartley 2002. The review concerns: **Desmet** & **Anderson** (London 2000).

50

Hall & Smith 1978: 93–95; *Stijnman 2005-1*: 6–7.

51

Garzoni 1641: 366–367.

52

Stijnman 2010-2.

53

Katja Kleinert studied interiors of Dutch seventeenth-century painting studios. She concluded that they had little to do with reality, but that studio interiors were merely intended as commercially attractive genre paintings; *Kleinert 2006*: 177–179. Most interiors of printmaking studios are depicted in prints, seldom in paintings and therefore have different purposes, such as illustrations of technical texts, emblems or printers' devices.

54

Van der Meulen 1897: 277; *Michel 1906*: 557–558; art reproductions of any kind are not under discussion here.

55

West (London 1932) is the first manual with real photographs of tools and workshop interiors tipped-in; **Lankes** (New York 1936) and **Skrbek** (Praha 1937) are illustrated with photographs with tools and workshop interiors printed from dot-screen autotype blocks.

56
Ginkel 2 (Utrecht 1985).

57
Bøegh (København 1998). See also: **Brooks** (San Francisco 2007); **Brown** (San Francisco 2006). Both books are accompanied by a DVD explaining the processes described in the book.

58
See the pedigree of Hayter's manual in Appendix 4, p. 421.

59
Stijnman 2012-1.

60
Kirby et al. 2010: 59 fig. 3, 350–351, figs 9–10.

61
Vasari 1568, vol. 2: 294–295; *1907*: 274–275.

62
Geisberg 1905, 1923; *Lehrs 1973*; *Von Rumohr 2008*.

63
Evelyn (London 1662).

64
Ibid., [1] at the back.

65
In this manner two distinct genres in print literature developed: instructive manuals and descriptive reference works, as discussed above under 'Art technological source research'.

66
Evelyn had done some etching, but that he was not a skilled plate printer is evidenced by the fact that he mistook the black pigment used for typographic ink for the black pigment for intaglio printing ink, see Chapter 4, p. 272.

67
Bosse (Paris 1645); **Evelyn** (London 1662): [1]–[2] at the back; **Bosse** (London 1662); **Evelyn** (Oxford 1906), part II.

68
Baldinucci 1681: 75, '*Inchiostro da Stampatori in rame*'.

69
Von Bartsch 1821, vol. I: VII–VIII, 1–47.

70
Ibid., VII.

71
Fielding (London 1841); **Fielding** (New York 1880).

72
Hind 1963.

73
Hammann 1857.

74
Lostalot 1882.

75
Krüger 1914.

76
Degaast & Frot 1934.

77
To name a few: *Dawson 1981*; *Griffiths 2004-2*; *Krejča 1990*; *Mayer 1984*; *Van der Linden 1979*.

78
Diderot & d'Alembert 1751–1780, vol. 7 (1757): 899–903; **Bosse** (Paris 1745); **Le Blon** (Paris 1756): 73–134.

79
Tischbein (Cassel 1790): 5.

80
For example, François Stapart quoted from the 'Encyclopédie'; *Diderot & D'Alembert 1751–1781*, vol. 7 (1757), 'Gravure': 877, 879, 'Imprimerie en taille douce', vol. 8 (1765): 607–623; **Stapart** (Paris 1773): 14–23 (on the copper plate), 23–40 (on the etching ground), 82–83 (on printing).

81
Ringwalt 1871; *Waldow 1884*.

82
Huffel 1926.

83
Nadeau 1989–1990.

84
Concerning the use of specimens in manuals: see Chapter 2, p. 90.

85
Bosse (Paris 1745), mezzotint on pl. 12–13 illustrating the explanation on pp. 117–123; **Bosse** (Paris 1758 [= 1769]), crayon engraving on pl.

XIV–XV illustrating the explanation of the technique on pp. 133–141. According to the note on p. 133, the specimens are copied and the explanations summarised from: *Diderot & d'Alembert 1751–1780*, *Receuil de planches*, *quatrieme livraison* (= vol. 5 (1767)), pl. VII no. 9 (mezzotint) and pl. VIII nos. 11–15 (crayon engraving). The specimens in the *Encyclopédie* are copied in: **Fokke** (Dordrecht 1796): pl. IX no. 9 (mezzotint) and pl. X fig. 11–15 (crayon engraving).

86
Evelyn (London 1662): 145–148; *Thomas 2010*: 283; **Wax** (London 1990): 21.

87
Bradbury 1856, with eight specimens of banknotes. **Deleschamps** (1835) and **Deleschamps** (Paris 1836): pl. accompanying the report on etching steel, with tone scales of sixteen different combinations of hatching and biting. **Fielding** (London 1841): pl. V, with specimens of eight different aquatint grounds and pl. VI with one scale with tone gradations in aquatint. **Green** (J.H.; London 1804): pl. opp. p. 3 with specimens of twelve different aquatint grounds. **Keller** (Stuttgart 1815), with specimens of his kind of mezzotint process. **Longhi** (Barth; Hildburghausen 1837): *Taf*. 1 nos. 9–10 with samples of hatchings with twelve different needles etched on copper and *Taf*. 2 nos. 12–13 with samples of hatchings with twelve different needles etched on steel. **Meynier** (Hof 1804), *Tab*. III *Fig*. 3, with a scale of tone gradations by hatching in line. **Perkins 4** (1821), with two specimens of banknotes from the same plate, the first printed at the beginning of the edition, the second after 30,000 impressions. **Pil** (1855): 3, with a specimen of an etched and printed daguerreotype plate (see Fig. 206, p. 230). **Schwarz** (Nürnberg 1805): *Tab*. VI with two scales with tone gradations in aquatint and two samples of coarser dust-grains. **Spilsbury** (London 1794): pl. at the back with six scales with samples of tonal etching.

88
Delatre (Paris 1887), plates together with descriptions of the various techniques; **Hassell 1** (London 1811), front., plates with descriptions at the back; **Hassell 2** (London 1826), front., pl. opp. p. 15, other plates bound in at the back; **Keller** (Stuttgart 1815), plates following the text; **Short** (London 1888), pl. opp. p. 30.

89
Goulding (Stirling 1910); **Holleman** (Utrecht 1927); **Hubbard 1** (London 1920); **Ligeron** (Paris 1923), loose inserts; **Lumsden** (London 1925), only the de luxe edition; **Paton** (London 1895); **Plowman 1** (London 1914); **Plowman 2** (London 1924); **Poortenaar** (Amsterdam 1930); **Preissig 1** (Praha 1909). Ziegler offered a separate portfolio with specimens of twenty-five intaglio printmaking techniques accompanying his manual; **Ziegler** (Halle 1901).

90
West (London 1932).

91
How to Distinguish Prints 1926. See also: **Hubbard 1** (London 1920).

92
Ivins 1958. The volume is often reprinted.

93
Brunner 1962. For similar works richly illustrated with details of graphic processes see: *Gascoigne 1988*; *König 2008*; *Vives Piqué 2003*. What these books have in common is that they explain graphic techniques illustrated with detail reproductions, which is strongly supportive in discerning particular printmaking processes. The student of the print is therefore advised to always bring a magnifying glass (enlargement 7× or more) for better recognition of the techniques applied in producing the prints under study.

94
Fiedler 1978; *Schwarz 1995*.

95
Smith (Paul; Sydney 1983).

96
Mudde (Utrecht 1987).

97
Eppink 1971.

98
Fielding (Maberly, London 1844).

99
Figueras Ferrer 1992; *Lilien & Gerhardt 1978*; *Stümpel 1980*.

100
Bigmore & Wyman 1880–1886.

101
Singer & Strang 1897.

102
Levis 1912.

103
Hubbard (London 1920): 137–160. In one of its earlier stages placing the material in the bibliography in chronological order was attempted but it proved to be difficult without serious loss of contextual information. Instead a general chronological index to the bibliography has been compiled, see Appendix 5, p. 602. All topics in the main text are dealt with in chronological order and refer to primary sources in the same manner.

104
Bridson & Wakeman 1984.

105
Stijnman 1986. The part on books in Appendix 4 is its augmented version, see Appendix 4, p. 433.

106
Blas Benito 1994.

107

Hammann 1857; **Fielding** (London 1844 = Maberly): 179–180.

108

Poole 1848. This first edition was followed by three cumulative editions (1853, 1882, 1885) and from 1888 by supplements, abridged editions, reprints, author indices, a reprint in 1938 and a microfilm edition in 1963 (1970). The present electronic resource version is available to subscribers only.

109

Art Index 1929–1967.

110

Appendix 4, p. 570: **Desmaiseau**; **Gautier-Dagoty**; **Montdorge**; **Mortimer**; **Robert**.

111

http://www.printshow.it/ (2010).

112

The many printmakers' weblogs, glossaries of printmaking techniques of online print databases, and education sections of museums' websites are not under discussion here.

113

Appendix 5, p. 599.

114

Börner 1863.

115

Meier 1941.

116

Lilien & Gerhardt 1978.

117

Le Blon (Stuttgart 1985).

118

Linden 1979: 95–152.

119

Hunnisett 1980; *Hunnisett 1998*.

120

Hanebutt-Benz & Fehle 2009; **Wax** (New York 1990); *Wiebel 1994*.

121

Griffiths 1987, *1990-1*, *1990-2*. For other publications by Antony Griffiths see Literature, p. 605.

Antecedents, Early Developments and Dissemination

To this was observed, that it also would be equally nice to remark, how art and technique always keep each other in balance and that they are so closely related that the one always inclines to the other, so that art cannot descend, without turning into laudible craft, while craft cannot raise itself, without becoming ingenious.

Johann Wolfgang von Goethe[1]

Intaglio printmaking concerns creating textures into the surface of a plate and printing it. The creation of the image consists of two separate procedures: the making of the plate and the printing of the plate. In the first centuries of intaglio printmaking the production of the plate was done either mechanically (engraving) or chemically (etching). Other ways of working were developed in the nineteenth and twentieth centuries.

An impression is made by filling the incised grooves or etched lines with ink, then cleaning the surface of the plate and transferring the ink remaining in the grooves onto a pliable support. Printing is commonly done on paper, because a damp sheet of paper can be easily moulded into the grooves to pick up the ink. Printing on parchment is possible, too, but the material was expensive. Paper was introduced in Europe in the fourteenth century and quickly became available in large enough quantities and at prices sufficiently cheap to replace the more expensive parchment. There was a direct correlation between the early development of intaglio printmaking and the availability of paper at prices significantly lower than those for parchment.

Technique, the handling of matter, does not come out of the blue. There are isolated antecedents and there are continuous developments. The former are incidental and the latter proceed step-by-step until the point is reached when a new, defined procedure can be discerned. In the case of intaglio printmaking, examples of engraved and etched objects can be found throughout the world, but they are isolated in place and time, and the objects created with these processes were not intended for printing. In Europe engraving techniques evolved towards the kind of intaglio printmaking that appeared in the Upper Rhine area in the 1430s. Information was disseminated, the etching of printing plates was practised in Augsburg from the mid-1490s and by 1525 intaglio printmaking techniques can be said to have reached maturity. The graphic process had become fully professional by that time, and the technical foundation was laid for the coming five centuries.

Engraving

The action of 'engraving' is the removal of material from a metal plate by pushing a 'burin' or 'graver' through the plate parallel to its surface. A burin is a tool that consists of a steel shaft, about 10 cm long with a lozenge section with sides of a few millimetres long. One end is set in a wooden handle and the other end has an obliquely cut tip that cuts shallow V-shaped grooves. Engraving should not be confused with 'chasing', ie hammering grooves in a plate with a chisel or tracing tool thereby pushing material aside. This can leave similar traces, but no material is removed in the process. With 'scratching', the engraver pulls the sharp tip of a stylus, a 'drypoint', through the plate's surface towards him, leaving burrs on both sides of the groove.[2]

Scratching in rock was universal and common from prehistoric times (Fig. 18). Objects made of stone, antler, bone or wood were incised with stone tools. Several tools and working methods have been identified and one particular

type of stone tool is termed a 'burin'.[3] Reconstructions have clarified the functions of a number of other stone tools, but whether the engraver pushed this 'burin' away from him, like the modern steel engraving tool, or pulled it towards him like a drypoint, or both, is uncertain. As soon as precious objects of gold, silver and bronze were created they were decorated with chased and scratched lines and dots. Many examples exist from the pre-Christian era,[4] but questions as to whether their decoration concerned actual engraving with a burin or scratching with a drypoint, and about where and when engraving with a burin began, remain to be answered.

Plates

Seven metals were known from antiquity: gold, silver, copper, iron, lead, tin and mercury.[5] Gold and silver are soft and can be engraved or scratched easily, but they are too expensive for regular use as printing plates.[6] Copper, sometimes brass, plates were preferred for engraving. Engraving iron with a hardened steel burin was possible, and engraved iron plates and objects are found. Iron was too hard to engrave printing plates comfortably before the nineteenth century, however, the metal is etched easily and iron printing plates were used from the mid-1490s until the 1540s.[7] Lead and tin can be engraved, but are too soft for printing many editions of more refined imagery, which would wear fast in inking and wiping.

Antimony and bismuth became known in Europe in the mid-fifteenth century and early sixteenth century respectively.[8] These metals are brittle, but are effective hardeners in alloys with lead and tin used in type metal for book printing.[9] Pewter is a tin alloy that can contain various metals such as copper, lead, antimony or bismuth depending on the function of the object cast from it.[10] Pewter intaglio plates were used in the eighteenth, nineteenth and first half of the twentieth century for printing musical annotations.[11]

Copper vs. other metals

Pure red copper is dense, homogeneous and tough, which makes it well suited for engraving, and it will not wear visibly in printing the first hundred impressions (Fig. 19). But it was never cheap, for which reason plates were engraved on both sides occasionally.[12] Brass would also have been chosen for reasons of economy:[13] brass is copper alloyed with zinc and therefore less expensive. It was often used for casting objects because of its gold-like appearance when polished. It is harder than pure copper and more difficult to engrave, but it is not as homogeneous and is slightly porous.[14] A variety of brass is latten, a copper alloy containing low percentages of lead and tin, used for engraved tomb plates in Germany, Flanders and England, although in a rather coarse manner.[15] Bronze is copper mixed with tin and has a yellowish appearance. It is hard, but porous, can be engraved and was used for printing plates in France in the nineteenth century.[16]

A small number of fifteenth-century engraved copper plates and two Italian brass plates have survived; the metals await analytical research to determine their actual composition.[17] A few fifteenth-century texts refer to 'copper' engraving plates.[18] A 'brass' (*lotoni*) engraving plate was specified in the contract between the architect Donato Bramante and the engraver Bernardo Prevedari in Milan in 1481 (see Fig. 21). The reason for choosing brass is not given, but it is speculated that it could be because this may have been a substantial edition and the harder brass would wear more slowly. From a practical point of view this is possible. Editions of up to a few hundred could have been printed by that time – a printing press was available and there was a market for prints. From later sources we know that a well-engraved copper plate could yield a maximum of 2,000 good to reasonable impressions before it had to be re-engraved; a harder brass plate would yield more of the same quality. But would Bramante have had such a high number in mind?[19]

The inventory of the Florentine shop of Alessandro Rosselli, son of the engraver Francesco Rosselli, was drawn up in 1527. Among many other articles it contained woodblocks and metal printing plates, Francesco probably having engraved most of the plates. The majority, apart from the woodblocks, were copper (*rame*) plates, there were two or three brass plates (*otone*, Hind 49, 50 (?), 78) and one plate was made of tin or pewter (*stangno*, Hind 78).[20]

To summarise, it can be concluded that the common plate metal was copper, while brass and tin plates were used occasionally.

Plate formats

With few exceptions plates were rectangular, either portrait or landscape format, sometimes square. Round or oval plates turn up now and again, while egg-shaped or polygonal plates do not seem to appear before the sixteenth century. The Master of the Playing Cards engraved rectangular plates, but the animal figures of some of the plates were cut out along their outlines and reused in various combinations. This makes them the first examples of so-called 'cut-shape plates'.[21] At the same time the impressions are also the earliest examples of multiple-plate printing.[22]

The bigger plates produced before 1460 measured around 22 × 28 cm; larger formats were produced only after that date.[23] The plates in the Rosselli inventory, probably most of them dating from the last quarter of the fifteenth

century, vary widely from about 5 × 7 cm to about 30 × 44 cm. The inventory also gives twelve examples of two or more plates that together form one larger image, especially when intended for maps.[24]

By 1480, exceptional plate formats were reached. The *Geographia* (Florence 1482) by Francesco Berlinghieri is illustrated with 31 plates bound with the text. The first plate, showing a Ptolemaic world map, measures 43 × 60 cm (Fig. 20),[25] considerably larger than the biggest plate up to that time from north of the Alps produced by Martin Schongauer, whose *Road to Calvary* (c.1475) measured 29 × 43 cm. The *Interior of a Ruined Church* by Italian Bernardo Prevedari of 1481 was, with a format of 71 × 51 cm, printed from the largest single engraved copper plate of the fifteenth century (Fig. 21).[26]

Even larger prints were produced whereby one design was engraved in two or three plates that were printed separately, the prints then being pasted together to form one composite image again. The earliest examples are found in Italy in the 1490s, with works by Mantegna, Mocetto and Rosselli.[27]

Tools

Many metal objects from antiquity are said to have 'engraved' decorations, but whether the metal is engraved with an actual burin is unknown.[28] Some early Han (late second to first century BC) Chinese bronze vases show engraved decorations but what tool has been used cannot be determined with certainty. The grooves are V-shaped, but seem rather wide for a burin.[29] Nowadays a steel rod – about 15 cm long and with a V-shaped bottom end, held vertically and tilted forwards and backwards in handling – is used for engraving metal objects and stone seals in China and Japan (Fig. 22).

The burin in Etruria, Rome and Byzantium
Gerhard Zimmer analysed tool marks of the decorations on the backs of Etruscan bronze mirrors of the sixth–fourth century BC and observed the following. With a number of mirrors the designs were created by means of chasing with a chisel or tracer. This is a punch with a tapering tip of a few millimetres wide. It was held vertically and hammered lightly into the metal, pushing aside the material to create a U-shaped groove.[30] He also identified the use of massive and hollow round punches. These are usually held vertically when hammered into the metal, although the hollow ones were sometimes held at an angle to produce semicircles.[31] Another group of mirrors shows linear patterns drawn in the wax mould before casting.[32] The techniques of chasing metal and drawing in the wax mould both produce U-shaped grooves with ridges to the left and right of the groove.

Important in the light of the possible early use of a burin is that Zimmer could also find V-shaped grooves, cut with the sharp tips of tools with a triangular or lozenge section, on mirrors from the fourth century BC. Convincing for the use of some kind of burin were the absence of ridges and the presence of remains of cut-off curls and overshot lines. The indentation of a sharp triangular point in the side of a crossing V-shaped groove is spectacular.[33] Zimmer's study thus shows us that the Etruscans engraved bronze with some kind of burin.

From the Etruscans it is a small step to the Romans. Pliny used the term *caelare* (from the Greek verb ⟨?⟩ 'to hollow (out), to excavate') in several instances when discussing decorated silver objects, but unfortunately he does not explain the actual metalworking technique.[34] More information can be gained from microscopic examination of tool marks in late Roman and early Byzantine jewellery by Ogden and Schmidt, which showed the use of a 'small, tapered, flat-ended, triangular-section tool'. Further reconstructions demonstrated that 'a graver-like tool with a triangular cross section' produced the closest results.[35] This suggests the use of a burin.

Metalworking continued after the fall of Rome, but whether the use of a (kind of) burin was continuous throughout the European Middle Ages is hard to say. There are enough metal objects decorated with incised lines (Fig. 25; see also Fig. 129, p. 154), but the nature of the decoration technique is seldom discussed in the literature. That there was a continuation of some sorts may be seen with the decoration of silver objects produced in Byzantium in the early Middle Ages. They show tool marks that are hard to explain in any way other than that they were cut with a burin.[36] Traces of engraving are also found with contemporary metal objects from outside the Byzantine Empire.[37]

Shape of the burin
The next question is what types of burins were available and what did they look like? From the observations by Zimmer and Meyers that the engraved lines they observed had V-shaped sections, it follows that burins had lozenge or triangular sections. Some early tools are classed as 'engraving tools', most resembling drypoints.[38] That seen by Vernier in Cairo looks more convincingly like a burin, with the tip cut obliquely and the back end of the blade curled to form a handle (Fig. 23). It was apparently made of bronze, not steel, but a sufficiently hard alloy should have been suitable for engraving copper or soft bronze.

In the *Schedula diversarum artium* (northern Germany, c.1100–1125), Theophilus explained how to make three

types of burins for engraving three kinds of grooves (Fig. 24).[39] All three are steel shafts 'as long as the middle finger' (8–10 cm), as thick as a 'straw' (a few mm) and set in a (wooden) handle. The first is somewhat thicker in the middle with a square section, the second is the same but has a lozenge section and the third one has a round section; all three types are to be made in different sizes. The ends are filed down obliquely at a sharp angle in order to form a facet, which gives a flat, a pointed and a curved tip respectively. Heating followed by quenching in water hardens the tips of the burins.[40] This manner of hardening is a very delicate process: if too soft the tip becomes blunt quickly, slides over the plate's surface and scratches it; if too hard the tip may break easily. Although it was a common practice, hardening the tip of a burin is only rarely described in any detail in engraver's manuals before the twentieth century.[41]

The use of burins with lozenge and round sections is, for example, observed in a twelfth-century book cover with gilded engraved copper clasps and corners (Fig. 25).[42] The front cover of the codex is decorated with a circular gilded copper plate in the middle and quarter circular gilded copper plates in the four corners, symbolising the Lamb in the middle and the Four Evangelists in the four corners. The top of the inner circle around the Lamb has five triangular dots, made by the point of a burin with a lozenge section. Many lines taper, done with a burin with a lozenge section. The wings of the symbols for the Four Evangelists are rendered with rows of semi-curved lines again achieved by wiggling with a burin with a round section.

Terminology of the burin

The expression Theophilus used for the burin is *ferrus fossorius*. *Ferrum* means 'iron' and is used for any iron tool in common Latin, but Theophilus predominantly wrote *ferrus* for 'tool'.[43] The adjective *fossorium* is derived from *fodere*, which means 'to dig'. Thus he is referring to an 'iron digging tool' or an iron graver, but does not use a particular term.

Victor Gay quotes two French sources, from 1420 and 1462 respectively, which use the term *burin* for the tools used to decorate a silver object by hatching.[44] The etymology of 'burin' is not well understood, but perhaps the word is related to the Latin *buris*, the extending part of a plough used to steer it.

The earliest printed Latin–German dictionaries, published in the last quarter of the fifteenth century, mention various kinds of metalworkers. The general term for such a craftsman is *faber* and the name of the metal he works is added: *aurifaber* (goldsmith), *cuprifaber* (coppersmith) and *ferrifaber* (ironsmith). *Celum* and *celtes* are the terms used for burins. They are derived from *celare*, or *caelare*, in another term *sculpere*, to engrave, but a term *caelator* or *sculptor* for an engraver of printing plates is not found.[45]

Punches, scrapers, burnishers and drypoints

Other tools described by Theophilus are punches, scrapers and burnishers. Punches come with a variety of tips, depending on the kind of work to be done, including one with a hollowed tip for indenting small circles and semicircles.[46] The scrapers are chisel-shaped, widening towards the sharpened end, some straight and some curved.[47] The burnishers are of the same shape, but blunt. Scrapers and burnishers come in different sizes; neither type of tool resembles the scrapers and burnishers used for copper engraving a few centuries later.

The oil painting of *St. Eloy in his Workshop* by Niklaus Manuel of 1515 (in the Kunstmuseum in Bern) shows (front right) a man who is polishing a ring by means of a burnishing tool. He holds a piece of steel with a slightly curved tongue-shaped end; the other end is fixed in a wooden handle.[48] This is different from the shape described by Theophilus, but similar to modern burnishers. Up to the early twentieth century, documentation of copper engravers' burnishers describes and shows only straight tongue-shaped burnishers.

Drypoints, ie simple steel rods with a sharp point or needles set in a wooden handle, would have been in use as evidenced by some goldsmith workshop interiors (see below). Lines scratched with drypoint can be observed in early German and Italian engravings. Plain drypoint work is seen in the prints by the Master of the Amsterdam Printroom.[49] His prints show the typical velvety effect of drypoint lines due to ink left at the sides of the burrs in wiping (Fig. 26). Dürer tried his hand at this technique and made three drypoint plates in 1512–1513.[50] However, the tool was largely used for scratching in the outlines of a design before engraving (see below).

Workshops

Workshop interiors of gold- and silversmiths showing their tools appear in prints, drawings and paintings from the mid-fifteenth century but images of workshop interiors of other craftsmen who engraved metals are practically non-existent. For the first depiction of an engraver of copper printing plates we have to wait until the portrait of Virgil Solis, etched by his former apprentice Balthasar Jenichen shortly after Solis's death in 1562 (Fig. 27). Representations of St. Eloy (Eligius from Noyon) were particularly suited to show the patron of the goldsmiths in his workshop, surrounded by tools, apparatus and assistants at work. Interesting for us, given the absence of any other engraver's workshop interior, is the equipment used in engraving.

St. Eloy at work

The oldest engraving of St. Eloy in his workshop (c.1448) is attributed to the German Master of the Bileam (Fig. 28). Four rows of tools are hanging from leather straps on the right-hand wall, from the top down: hammers, burins, scissors and pincers and files. Six burins are shown, their shafts straight and set in (wooden) handles. Further details cannot be seen and the handling of a burin is not shown. On the table is a two-pointed stylus, which is probably a drypoint meant for scratching a design into metal before engraving.[51]

They were said to be Children of Mercury: astrologers and musicians, scholars and craftsmen of various disciplines whose deeds were influenced by the planet Mercury. Baccio Baldini's engraving (c.1465) of the subject depicts the sculptor, the mural painter and the goldsmith at work. The shop of the goldsmith, open to the street, shows a sitting man engraving human figures with a burin on a flat rectangular (metal) plate (Fig. 29). In the picture the plate is about as high as the engraver's lower arm (c.45 cm) and at least a fifth wider (c.55 cm), if this image is taken literally. To his right are two more burins with shafts 'as long as the middle finger' and pear-shaped handles. What could be an oil-stone is at his elbow.[52]

This is the oldest depiction of the act of engraving. The palm of the right hand pushes the handle of the burin and the index finger steers the shaft. The plate is laying flat on the workbench and will have been turned to position with the left hand. The two burins on the bench could have different sections, or the engraver may have sharpened three burins in advance so that he could continue working without having to interrupt his work to resharpen his tools. Judging by its size, the man is engraving a large decoration plate or perhaps a printing plate.

More depictions of goldsmiths' workshops are found throughout the sixteenth century, all showing the tools and apparatus used in the workshops including burins.[53] Among them the painting by Niklaus Manuel of St. Eloy (1515) stands out for its coloured realistic representation. The man with the burnisher has already been discussed. The young man in the middle back of the painting engraves a small silver plate with a burin.[54] A second burin set in a wooden mushroom-shaped handle lays to his right and a metal stylus is in front of him. For easier handling the small plate is attached (with pitch or wax?) to what looks like a star-shaped, nine-pointed leather bag or cushion. Observe that the man does not hold the plate, but can manipulate it by turning the cushion with his left hand while engraving with his right hand. This is the only instance in which such a model is depicted. The kinds of leather cushions known from the seventeenth century onward are round and plates lay loose on top of them.[55]

Engraving techniques

The common procedure in engraving is to cover the copper plate with a film of wax, transfer the design onto this and trace the outlines with a drypoint.[56] After cleaning off the wax, the tracing leaves thin scratches, which act as guidelines for the engraver; these can often still be seen in the final print. Traces of drypoint outlines (*pentimenti*) are found from the very beginnings of engraving in the fifteenth century, some of which may illustrate the original intentions of the design and the changes made in the final engraving.[57]

Early German engraving

Theoretically the Master of the Playing Cards had available various punches, a drypoint and burins with lozenge and round sections. From his prints it can be discerned that the outlines of his figures are engraved (Fig. 30; see also Figs 40 and 41): they are clearly defined with the individual lines having tapering ends typical of grooves cut with a burin with a lozenge section. The master created tones in between the outlines by hatching lines close to each other much as a draughtsman would create tones with a sharp-pointed quill or a silverpoint. These hatchings – thin and straight lines running parallel to each other – are of a different nature to engraved lines as they are made with a drypoint scratching the surface rather than really digging into the metal. This kind of hatching also differs from that used by goldsmiths, who more commonly applied a more mechanical-looking method of engraving crossing lines to fill in backgrounds (see Fig. 129, p. 154). Hatching with a drypoint was not in use for long – by the middle of the century German engravers engraved the complete plate with a burin of lozenge section.

Early Italian engraving

Early Italian engravings are divided into two distinct ways of working: the earlier 'fine manner' (*maniera fine*) and the later 'broad manner' (*maniera large*). The difference in appearance is due to the use of different tools. Prints in the fine manner are older and generally show figures composed of broad outlines and fine, dense (cross-) hatching. This suggests that the thicker dark outlines may have been engraved with a scorper, a burin with a round section.[58] The hatching has the appearance of being lightly and quickly scratched into the plate with a drypoint.

The broad manner appeared in Florence after 1480 and seems to have been introduced by Francesco Rosselli.[59] The first and second versions of a series of Apostles and Sibyls show marked differences (Figs 31–33). The first versions are engraved by Baccio Baldini and appear as described above; the second versions, attributed to Francesco

Rosselli, are engraved with a burin of lozenge section only for the outlines and the hatchings. Such a burin engraves sharply defined grooves that allow the printing of longer print runs than from plates scratched with a drypoint.

But how does this coincide with the above-described manner of engraving visible in Baldini's *Children of Mercury*? Baldini convincingly shows a man handling a burin with two more lying on his right, but a drypoint is absent. It could mean he is engraving a decoration plate. The proportions of the image suggest a plate format of c.45 × 55 cm, which would be too large for a printing plate in a period in which Italian engravings were printed by rubbing only. Otherwise engraving with a burin with a lozenge section is observed occasionally in Italian prints from before 1480.[60]

Tone

Tonal effects appear from the beginning of engraving, as can be seen in works by the Master of the Playing Cards in which he creates three-dimensional effects using drypoint hatching.[61] From early on engravers were interested in suggesting volume – such effects can be achieved by dotting the plate's surface with a burin or with a drypoint. The difference between the effects of both tools can be seen under magnification: the tip of the burin creates a triangular dot, the drypoint a round dot.

Linear hatching systems can also suggest volume but the effect is harsher. Dotting allows for smoother rendering of skin, texture and volume, and for atmospheric effects, with gradual transitions from lighter to darker areas and glowing reflections within shadows. The disadvantages of stippling, compared to engraving, are the shallow indentions that limit the number of impressions and the difficulty of reworking the worn plate without changing the tonal effects. The additional dots needed would never be in exactly the same positions and of the same depths, and consequently the subtlety of the hues would be lost.

Similar techniques are often found later: areas of engraved dashes enhance the differences between foreground and background, express the outward appearance of stone and skin, and may even suggest colour.[62] Giulio Campagnola was the first to extensively use stippling from shortly after 1500 (Fig. 34).[63] Under magnification the dots appear more like tiny dashes instead of triangular or round dots, which gives the impression that they are produced by short strokes with a burin.

Intaglio Printing

The making of the plate is one part of the printmaking process, the printing is the other.[64] As explained above, cutting grooves into the surface of a metal object has been performed since pre-Christian times. The new process that appeared in the 1430s replicated the intaglio design by filling the incisions with an 'ink', cleaning the surface of the plate and transferring the ink onto a 'support'. Printing an image on paper is much like printing woodcuts, but there is an essential technical difference: in woodcut printing the surface of the relief is inked and printed, while the recessed areas remain blank; with plate printing the surface is blank and the grooves contain the ink.

Relief printing can be seen in prehistoric rock paintings: people dipped their hands in paint and pressed them against the wall, almost like a form of block printing. It is, however, technically impossible to transfer ink from the grooves of a rigid plate directly onto a hard surface because the surface needs to be moulded into the grooves in order to make contact with the ink. This demands a resilient material that can be closely shaped to the relief of the plate and is able to pick up the ink. The ink needs to be of such a nature that it can be rubbed into the grooves, cleaned off the surface of the plate without also being dragged from the grooves and then transferred onto a support. The first engravings appeared in the 1430s, the roller press was introduced in the 1460s and the first experiments with colour printing were also carried out at that time. But it was only after 1500 that the basic technical problems were resolved sufficiently to allow the possibilities offered by intaglio printing to be properly realised.

Printing support

Intaglio printing depends on five elements: the plate, the support, the ink, wiping the surface of the plate and the actual printing. Paper proved to be the ideal support for intaglio prints. Some fifteenth-century engravings printed on parchment are found and from the second half of the sixteenth century plates were occasionally printed on textile.[65] With production increasing and prices dropping, paper was well on its way to becoming generally available in southern and western Europe after 1400.[66]

Paper in Asia

The first paper was made from hemp in China in the second century BC. It was a coarse material, only good for wrapping.

Technical improvements resulted in paper suitable for writing on with a soft brush in the second century AD, while production and quality really increased with the introduction of block printing from the sixth or seventh century onwards.[67] Paper production began in the Middle East in the ninth century, to spread further to Damascus and to other places in western Syria where it developed into a major industry with extensive exports, moving all the way west to Fez in present-day Morocco. Byzantium itself did not have any paper mills and imported paper from Syria.[68] This was superseded by imports from Christian Spain in the twelfth century and from Italy in the thirteenth.[69]

Paper in Europe
European paper production started in Spain at Xativa (San Felipe) from the middle of the eleventh century and was followed by export to the rest of the Mediterranean. Production then increased quite dramatically in northern Italy from the middle of the thirteenth century.[70] This was due to a number of technical improvements made in Italy, such as the use of brass wire screens in the mould, perfection of the pulping mechanism, gelatine sizing of the sheets and the introduction of watermarks to denote particular qualities.[71] Because of the increased paper quality and aggressive marketing techniques – and the fact that Spanish papermakers had not changed or advanced their production methods – Italian paper came into use throughout the Mediterranean and the Middle East before 1500, competing strongly with local papermaking industries.[72] Paper was also exported across the Alps, followed by the establishment of paper mills in France and Germany from the middle of the fourteenth century onwards.[73]

Availability and costs of paper
The number of sheets produced increased considerably. By the early fifteenth century, the Italian town of Fabriano boasted about forty paper mills producing some four million sheets annually.[74] Consequently prices dropped like a stone: in the fourteenth century, paper was four times less expensive than parchment in France but by the fifteenth century it was thirteen times cheaper.[75]

Better quality paper and more efficient production methods in combination with improved marketing techniques secured the general availability of paper at low prices.[76] This was accompanied by the increasing use of paper for administrative purposes replacing papyrus and parchment, and especially for low cost commodities.

The introduction of card games in Europe from 1376, their massive popularity through all layers of society and the consequent booming manufacture of playing cards were major factors responsible for the increase of paper production.[77] There were two practical reasons necessitating the use of paper for playing cards: first, several layers of paper were pasted to the backs of playing cards to stiffen them (cardboard is a modern invention);[78] secondly, card games were played regularly if not daily, thus the cards wore quickly and needed frequent replacement. The availability of reasonably priced paper by the later fourteenth century was important for the development of intaglio printmaking. Acquiring paper was rarely a problem by the 1430s.[79]

Printing medium

The printing medium or ink commonly used for intaglio printing is a mixture of a binder, ie processed oil or 'varnish', and a powdered colouring material.[80]

Early decorated ceramic objects from the prehistoric settlement of Çatalhöyük in southern Turkey are called 'stamps'. They are thought to have been used for relief printing, but were perhaps used as moulds.[81] Textile printing (stamping) in relief seems to have been practised in the Caucasus around 1000 BC, in India in the fourth century BC, in China c. AD 100, in pre-Colombian civilisations in Central America and in Egypt in the fourth century AD. Block printing on paper is found in China in the eighth century, if not earlier.[82]

It was probably through trade contacts with North Africa that the technique of textile printing became available in Europe in the fourteenth century.[83] The printing ink used was initially made of a dyestuff in water. The very different technique of printing cloth with oil-based inks was practised in the third quarter of the fourteenth century, as demonstrated by the tapestry of Sitten (Switzerland, Kanton Wallis) – a piece of textile printed with oil-based inks in black and red – and had its provenance in northern Italy.[84]

Oil varnish
Oil paints and oil-based inks use the same colorants and have binders that originate from drying vegetable oils, such as linseed oil or nut oil.[85] The difference is that an oil paint should be fluid enough for handling with a brush, while oil-based printing ink is a stiff paste. Starting from, for example, linseed oil, the oil for paint is heated at about 125°C for half an hour and stays liquid. For printing ink the oil is heated to around 300°C and kept at that temperature for a shorter or longer period until the required viscosity is reached; the volume of the oil is strongly reduced by boiling. Processed oil for paint is therefore thin, whereas the viscosity of varnish for printing ink varies from syrupy to gum-like.

Ink is made by mixing oil varnish with a dry colorant and grinding this mixture to a homogeneous stiff paste.

When the ink is rubbed into the grooves of the plate and the surface wiped clean, the design in the plate can be replicated by means of rubbing, casting or printing in a press.[86]

Several vegetable oils have good drying effects, ie they absorb oxygen from the air by which they dry. This makes them well suited as printing ink.[87] Some mediaeval recipes for boiling linseed oil come very close to varnishes for printing inks. Prescriptions can be found in the *Compositiones variae* from south of the Alps (the earliest known copy dates from around 800) and in the *Mappae clavicula* from north of the Alps (the earliest copy is from the first third of the ninth century).[88] Both groups of recipes are related and date back to a lost common ancestor.[89] The recipes are much like those found in the *Schedula diversarum artium* (Theophilus, 1100–1125), which prescribes how to heat linseed oil until boiling and then add hot liquid resin. The material produced was a transparent varnish for coating painted wood; another variety was mixed with minium or vermilion to make a red oil paint.[90]

The development of the preparation of oil-based media continued in the following centuries.[91] One type of product was used for oil painting, others as glue, for coating or for printing. By the 1430s technical knowledge had advanced to the point that recipes further differentiated between relief and intaglio printing ink.

Black pigments

The kinds of black pigments used for intaglio printing are, in most cases, produced from charred organic materials such as charcoal and bone black; lampblack made from soot is the other black pigment.[92] Mediaeval recipes for intaglio ink are unknown, but recipe number 330 in an Italian manuscript in the Biblioteca Marciana in Venice gives a prescription for printing copper plates; the manuscript itself can be dated to c.1570, but this recipe may have an origin in the late fifteenth century.[93]

The black pigment in the recipe is made from charred rinds of edible long pumpkins.[94] The carbon content of this pigment is not high and hence the resultant pigment is more grey than black. Observation of early Italian engravings, such as the first and the second Apostle and Sybil series by Rosselli previously mentioned, reveals that the lines in those prints are invariably of a dark grey hue. The printed lines comprise relatively large pigment grains of a low hiding power and backgrounds are wiped clean; this may point to a charcoal black (Figs 31 and 32; see also Fig. 42). It is not until the third series, printed after 1500, that the ink appears deep black. The lines have a greater contrast and the prints show a heavy plate tone, which should be due to a deep black opaque pigment with a fine grain, such as lampblack (see Fig. 33).

Similarly, lines in prints by Lucas van Leyden look dark grey and granular. The overall effect is that Lucas's engravings have a somewhat silvery appearance.[95] The use of a dark grey ink accords well with the atmospheric effects he creates with his differentiation in the handling of the burin. In comparison, engravings by Dürer show deep black continuously printed lines, strictly defined, not granular, with little plate tone. Black lines and blank paper contrast strongly with each other, giving his prints a hard appearance.[96]

It should be noted that these are general observations. Coverage and contrast differ to such an extent that Lehrs does not think it possible to relate a particular ink to a particular place and time.[97] Only systematic observation of ink hues, registration of watermarks and comparison with scientific examination of the printing inks can bring more clarity here. At least they make clear that ink formulation was more of a local affair, dependent on the skill of the plate printer and the availability of particular materials. Dense black inks became standard throughout Europe by the seventeenth century.

Preparation of the ink

Prescriptions for textile printing appear only after the Sitten tapestry was manufactured. They all advise how to make ink by mixing the pigment with a binder made from linseed oil, an 'oil varnish'. The first text (c.1400), by the Italian Cennino Cennini, has a number of recipes for stamping woodblocks with coloured oil-based inks on textile. He explains how to prepare a varnish by boiling a certain quantity of linseed oil down to half of its volume, which is similar to recipes for boiling oil for printing ink of later centuries. Further on in the manuscript he describes how to make ink by grinding together varnish and pigment.[98]

Cennini was followed by other authors explaining block printing on cloth, leather and, at the end of the fifteenth century, also on paper.[99] These treatises show that the preparation of oil-based printing inks was indeed well known from the later fourteenth century. It does not mean that relief printing inks are the direct predecessors of intaglio printing inks, which could also be found with oil paint or shoe polish for example – it simply means that mixing an oil varnish with a pigment, for whatever purpose, was known by the early fifteenth century. Note that water-based inks were also used for printing woodcuts and there are suggestions that some of the early engravings may have been printed with a water-based ink, which technically is not impossible.[100]

The abovementioned Marciana recipe continues with the instruction that the charred pumpkin rinds should be ground and mixed with an oil varnish, with reference to the preceding recipe, which is for a typographic printing ink. This recipe in turn refers to a varnish for metal objects, or some varnish could be purchased from an apothecary. The manuscript itself gives two recipes for an oil varnish: the first one is less detailed but makes clear that the varnish was

rather syrupy; the second stipulates that linseed oil and colophony should be boiled together with the addition of some burnt alum, the whole then boiled over a slow fire. This means its viscosity was more dependent on the sticky colophony than the degree of polymerisation of the oil.

Inking

Paper was available by the early fifteenth century and oil-based printing ink could be made, but where, when and who came up with the notion of filling the grooves of the plate with ink and cleaning the surface before printing?

Forerunners for intaglio printing can be found on Chinese bronze vessels from the Shang and early Chou periods (1500–500 BC) that have grooves with black fillings. The composition of the material could not be identified, but it contained quartz and carbonaceous material, which could indicate a kind of lacquer.[101] Other examples are techniques for encrusting, such as in two-coloured ceramic tiles whereby incisions or impressions were made in clay of one colour and then filled with clay of another colour.[102] Incisions in mediaeval stone grave plates were filled with materials in contrasting colours.[103]

Closer to plate printing are the metal decoration techniques of *champlevé* enamel, *cloisonné* enamel and *niello*. *Champlevé* enamel dates back to the early European Iron Age period and was used throughout the Middle Ages. With this technique gold or silver was incised and the grooves filled with glass-like material, which was melted into it. With *cloisonné* enamel, used in Byzantium and during the Western Middle Ages, the matter is melted within cells made of thin strips of metal.[104]

Niello is said to have been practised in the Bronze Age, but this is under discussion due to the lack of chemical analyses of the black material.[105] In this process, a mixture is prepared of sulphur powder and filings of silver, copper or lead, which are fused to black sulphides of the metals, and after cooling ground to powder. The metal object is painted with this powder and heated until the powder melts and settles on the surface as black decoration. This form of *niello*, at that time referred to as *nigellum*, was in use continuously from antiquity through the Middle Ages.[106] Theophilus described another kind of *niello* technique by which the artisan filled engraved lines and cleared the surface of the superfluous powder. The object was heated to melt the powder, which then stuck in the grooves. After scraping and polishing the object's surface, the grooves showed up as black in the shiny metal.[107]

Filling letters etched in iron with a coloured resin, a kind of *pseudo-cloisonné*, is found in the fourteenth-century *Secretum philosophorum*, probably of English provenance.[108] An etching recipe in the fifteenth-century *Liber illuministarum* from Tegernsee in Bavaria describes how after etching the grooves are coloured with an art(ificial) yellow (*kunstgel*).[109]

An example produced in the same region and in the same period as the first intaglio prints by the Master of the Playing Cards is a large brass *Votivtafel* manufactured in the Upper Rhine region in the 1430s (Fig. 35). The lines of image and text are engraved in intaglio, and the grooves contain remnants of oil-based substances in different colours. This takes us to the brink of real intaglio printing and is close to the place and period during which the Master of the Playing Cards started producing his prints. The pigments in the *Votivtafel* are verdigris, lampblack, vermilion and azurite. The binder is a mixture of a drying oil and a natural resin, possibly linseed oil and colophony such as Theophilus's varnish, with some vegetable wax added.[110] This is as close as it is possible to get to ink an intaglio plate before it is printed. One step further would be placing a sheet of damp paper on top of the freshly coloured plate and printing it, which would then create an *à la poupée* print *avant la lettre*.

Rubbing

The big difference between relief and intaglio printing is in the pressure needed. In relief printing the ink is on top of the printing block or type and the paper just touching is enough to offset some ink. Further pressure secures a homogenous registration. In intaglio printing the ink is in the grooves cut into the surface of the plate. A sheet of paper laid on the plate will therefore not take the ink; the paper must be pressed into the grooves. The paper is made soft and pliable by dampening it with water and considerably more pressure than that required in relief printing is needed to force the paper into the grooves in order to contact the ink and make an impression.[111]

Pressing incised surfaces into soft materials is common to all periods, such as thumbprints in clay or wax. More formalised examples of intaglio matrices are found with the appearance of engraved roller seals in the fourth millennium BC, used extensively for impressing marks in clay throughout the Middle and Near East, as well as in Egypt. During the Han era, the Chinese made bricks decorated with imagery in relief.[112] The Romans pressed high reliefs into such materials as wax, lead, bread or clay (*terra sigilata*).[113] Mediaeval European seals in wax and lead are abundant. The process of making these kinds of imprints could be called 'moulding'; printing it is not because ink is missing.

The action that defines intaglio printmaking is the transfer of ink from the grooves of a plate onto a support. The earliest impressions of engravings from the 1430s to the 1460s were made without a press. Such characteristics as small plate sizes, unevenness of impression, grainy appearance and uncoordinated doubling of lines demonstrate this.[114]

Following the preparation of the ink, the recipe in the Marciana manuscript referred to instructions to put the ink on the copper plate, rub it into the grooves with the fingertip and clean the surface of the plate.[115] A sheet of (damp) paper is placed on the copper plate, a piece of serge cloth folded two or three times is placed on top of the paper, and on top of this a sheet of parchment. The sandwich is rubbed vigorously with a polishing tool to force the paper into the grooves against the ink and in this way the plate is printed.[116] This method differs little from that used to take rubbings from engraved objects in later periods.[117]

There is little to prove that mediaeval engravers of metal objects (including goldsmiths) from north of the Alps took rubbings of their work; a possible exception being a rubbing from the lower arm of a cross, a reliquary or the foot of a chalice, in the University Library of Cracow.[118] The style of the image is from the second half of the fifteenth century and it shows the Evangelist Matthew seated with a banderol in his hands reading MATHEUS in mirror image. The reversed text and the odd shape of the impression confirm that the metal plate was not meant for printing, which leaves the questions as to when the rubbing was done, for what purpose and by whom.

A variety of rubbing is printing by tapping the damp paper into the grooves of the plate.[119] The plate is inked and wiped, covered with a damp sheet of paper, and the verso of the sheet tapped with a stiff brush. In this manner the paper is moulded around every corner and picks up the ink from the grooves.

Printing press

It has often been discussed whether it would have been possible for early engravers to have printed their copper plates on a book printing press. Invariably experimentation shows that with some difficulty it is feasible to obtain poor impressions of small plates in that manner.[120] Technically, the typographic press is built for a different mode of printing – the concept of the matrix and its inking differs from that of an intaglio matrix. A relief printing press is not suited to intaglio printing because the machine is designed and constructed to print from the surface of a relief printing forme and therefore cannot exert enough pressure to force the paper into the grooves deeply enough.[121]

Another reason why it is unlikely that early engravers printed their plates on a book printing press is that the only such press available was that in the printshop of Johannes Gutenberg in Mainz in the 1440s and 1450s. Gutenberg was busy with his own printing, working in secrecy, so there would have been little opportunity for engravers to have their impressions pulled there. It was not until Johann Fust and Peter Schoeffer took over the shop in 1455 that other typographic printing offices appeared elsewhere.[122] By that time some twenty copper engravers were, or had been, active north of the Alps.[123] It is likely that on occasion attempts would have been made to print an engraved plate with a linen press, but it is highly improbable that engravers working in the Upper and Lower Rhine areas, southern Germany and Burgundy before 1460 would have travelled up and down to Mainz to have their plates printed, or shipped them over there, regularly. Finally, a roller press for printing engravings was introduced a few years later.

Printing by roller press allowed the pulling of numerous editions to satisfy the needs of a growing market. Mechanised printing also produced more homogeneous impressions, which paved the way for the next generations of artists to give the new medium its own status.

The roller press
Contrary to spreading the pressure over a larger surface, as is done with the platen in a book printing press, with intaglio printing all the pressure is concentrated on a very small surface. In burnishing, a tool with a rounded end is in contact with the plate at a point or short line. This idea is transposed to the mechanisation of intaglio printing by means of a roller press. Here all pressure is concentrated on the line where the upper roller touches the plate – the smallest surface possible – with the paper in between, but this is not enough. A resilient material is needed between the rubbing tool or roller and the paper to create a homogeneous impression, for which purpose felt is often used. Felt has the property that it can be compressed and expands again as soon as pressure is released. This is exactly what happens in printing – when a groove is directly underneath the burnisher or the upper roller and the paper is pressed into the grooves by the expanding felt.

The introduction of the roller press meant the mechanisation of intaglio printing.[124] The origin of this apparatus is not documented, but the general consensus is that the machine evolved from some kind of rolling pin. Henri Meier suggested that the roller press developed from machines used for finishing textile, so called 'mangling'. This finishing technique was probably introduced in Florence before the close of the thirteenth century.[125] In the earliest machines, rollers moved over a flat base (Fig. 36).[126] A plank on top of the rollers was weighed down with lumps of iron or stones and by movement of the plank the rollers smoothed the textile. At some point this developed into a 'calander', a ma-

chine with two wooden rollers through which the textile was run.[127]

Looking at early impressions of intaglio prints, a change in quality is discernable in German and Italian engravings in the third quarter of the fifteenth century. Hind considered this to be related to the introduction of a roller press.[128] In order to confirm this, Jacques Bocquentin compared the improvements in printing quality of engravings printed in the period with the general increase of plate formats. From the results he concluded that the first roller press for printing engravings appeared in 1460–1465 and the suggestion is that it happened in the Upper Rhine area in the studio of the Master E.S.[129] The rollers of this press may have been about 30 cm wide.[130] A similar comparison by Bocquentin for Italian prints showed just such a change there less than ten years later. This means that roller presses appeared in Florence, perhaps in the studio of Antonio Pollaiuolo, and in Mantua from around 1470, with the rollers of these presses having a width of at least 40 cm.[131]

The introduction of the roller press almost coincides with a remark in an edition of Ptolemy's *Cosmographia*. This atlas was published in Rome in 1478 and the plates were designed and perhaps also engraved by the German Konrad Sweynheym. According to the dedication 'he taught the Italian workmen, who produced the book, how to print the copper plates'.[132] It has been suggested that Sweynheym had been employed in the Mainz (book) printshop of Fust and Schoeffer until the sack of Mainz in October 1462, after which he moved south and together with Arnold Pannartz established the first Italian typographic printshop in the monastery of Subiaco, east of Rome. The shop was active from 1464 to 1473 when it went bankrupt. Next Sweynheym supervised the engraving and printing of the *Cosmographia* from 1474 until his death in 1477, in which time he apparently taught local employees a method for printing engravings.[133] What attracts one's attention, however, is that the maps look different from Italian engravings of that time: the lines appear more finely engraved, printed with really black ink and the impressions in general have more contrast.

Landau and Parshall discussed an early example of an engraving unmistakably printed by means of a roller press: the *Interior of a Ruined Church or Temple, with Figures* by Bernardo Prevedari from 1481.[134] The engraving is known in two copies and both show the following phenomena. Because the plate was large (c.70.5 × 52 cm) two sheets of paper were pasted together overlapping by about a centimetre. The print has a light plate tone in which vertical striations can be seen, ie thin lighter and darker lines that run the length of the paper from one sheet to the other with no interruption at the overlaps. As the authors explain, this is because it was printed on a roller press without a felt blanket to cushion the roller. The wooden roller would have been turned on a lathe and the uneven surface, due to the traces of the chisel, caused local differences in pressure, the lighter lines showing the deeper cuts of the tool. The strip printed better than the rest of the paper because more volume was available at the overlapped areas to be pressed into the grooves, allowing the paper to be pressed a little deeper into the grooves and thereby taking the ink better. With a shorter plate edge of 52 cm the roller width would have been c.60 cm.[135]

Other roller presses

In the absence of any documentation of early roller presses for intaglio printing, we may look at roller presses for flattening bars of lead and pewter to thin strips. Constructions were only strong enough to roll soft metals cold, for which use they are encountered regularly from the sixteenth century.[136] Leonardo da Vinci sketched his ideas for such presses around 1500.[137] The principle of the roller press is clearly shown: two rollers are set in a frame and a crank is used for turning the rollers. The upper drawing shows that the rollers are in contact with two smaller rollers, one above and one below, which prevent the larger rollers from bending. The lower drawing shows a large cogwheel connected to the lower roller and a lantern turned by a crank to move the roller. The rollers themselves, Leonardo proposes, were to be cast of bell metal (bronze) with exchangeable iron axles.

A third sketch of a similar press shows both rollers with cogwheels, forming a gearing, but no star wheel or crank to turn them is present. The suggestion is that this is a further development of the other two designs. The same manuscript also has sketches of another press for flattening strips of lead, which show different systems for regulating the pressure.[138] Leonardo had a keen interest in mechanics and apparatus; he also revealed his thoughts on improving the book printing press and how to etch relief-printing plates. Nothing is known, however, about any involvement by Leonardo in intaglio printing.[139]

Casting

The other way to replicate the design in the plate was by casting for which various materials were available, such as gelatine, gypsum, sulphur and wax.[140] To make a cast the plate is inked, the surface cleaned with the ink retained in the grooves and a rim built around the plate. The kind of gelatine mentioned in later sources is isinglass, glue made from a fish bladder by dissolving the dried bladder in water to make a gel. Gypsum is mixed with water to a creamy liquid, and sulphur and wax are heated until molten. These liquids are poured on the plate and sink into the grooves to contact the ink. Plate and cast are separated after drying and hardening, and the image – the lines coloured and in

slight relief – is visible on the cast (Fig. 37).[141]

A variety of a cast is the 'pasteprint' (*Teigdruck*), a kind of object produced in the second half of the fifteenth century (Fig. 38). The technique actually used is still under discussion but one suggestion is that a cast of a metalcut was pressed into a resin-rich paste spread on a sheet of paper.[142]

Vasari attributed the beginning of Italian intaglio printmaking, in the sense of pulling intaglio proofs from engraved plates, to Maso Finiguerra. Introducing the engraver Marcantonio Bolognese (Raimondi) in the second edition of his *Vite* (1568), Vasari described how he thought Finiguerra would have printed from sulphur casts of impressions of *niello* plates in fine earth.[143] Technically this is possible with casts of a few centimetres in diameter as Christian Schuchardt demonstrated and, although it is complicated, it allows prints to be made of an image after the grooves of the original plate are already filled (Fig. 39).

Niello *proofs*

There are a number of so-called '*niello* proofs', ie impressions of small engraved ornamental plates, the earliest dating back to around 1460. This is the period in which Finiguerra was active, and a number of *nielli* sulphur casts and *niello* proofs are ascribed to him, but no copper engravings.[144] If they are indeed from the fifteenth century, they would have been intended as models and not produced in any large numbers, let alone editioned and published. If from a later date their style would have been too outdated to be still used as such and the intention would probably have been to satisfy the antiques market.[145]

Distinguishing between earlier and later proofs is notoriously difficult. Study of the paper itself – for example, watermarks and the paper's structure – is not very helpful because the small formats can only supply limited information.[146] Also any material research of these objects beyond mere observation is largely absent. Analysis of papers, pigments and binders, and comparison with available recipes and contemporaneous impressions of copper engravings, as well as references from reconstructions, may add information by which further distinction can be made between early and later impressions. Dating silver plates and sulphur casts seems only possible by tracing their provenances. *Niello* proofs have characteristics different from prints from copper engravings, such as texts in mirror image, but not in all cases. Copper engravers made mistakes in engraving in reverse, copper and silver engraved plates could have been used as decoration, and there are copper engravings in the *niello* style. A final argument is that if *nielli* were indeed intended for replication, a number of both casts and rubbings of the same plates should have survived but none has.[147]

In summary, *niello* proofs should not be seen as the starting point of intaglio printmaking. The available material suggests that Italian goldsmiths derived them from the earlier German example of printing copper engravings in order to record their work. Every craftsman in the visual arts needed models for study and for making new objects.[148] Copies of one's own and other craftsmen's work served as examples, for the whole or the detail, and a variety of methods was used for duplication. Simply redrawing the example in front of him should not be a problem for the trained craftsman. Tracing techniques such as pouncing, squaring and tracing already belonged to his 'tool kit', and the new tool in the kit of the Italian goldsmith was taking rubbings of plates with incised grooves.[149]

Printing editions

Typical for printmaking is the option to print an edition, ie to pull more than one impression from the block or plate.[150] Edition numbers of hand-rubbed engravings would not have run into the hundreds because the medium was new, technical means limited and the market small. The plates of the Master of the Playing Cards were engraved with broader outlines; tones were then created by fine drypoint lines scratched in between the outlines (see Fig. 30). These tones could not withstand much wear and the same can be said of the similarly prepared Italian plates done in the 'fine manner' of some decades later.

Engraving by means of a burin only improved the quality of the lines, first in Germany and later in Italy.[151] The introduction of the roller press in the 1460s made it possible to produce better quality impressions in less time and to edition plates in greater numbers with fewer differences between the various proofs. Wear of the copper plate would soon have been observed. When production numbers increased it would rapidly have become apparent that editions of engraved copper plates could be pulled but in much smaller numbers than editions of woodcuts.

With the market for prints expanding, solutions to this problem were found. One way to increase the life of a copper plate was to re-engrave worn lines; another was to copy the originals. Israhel van Meckenem practised both and before him, around 1460, the Master of the Power of Women copied the prints of the Master of the Playing Cards, as did others.[152] A third solution was to engrave more plates after the same design, either immediately after each other and

based on the same drawn design, or later, but still in the same studio (Figs 40 and 41). A variation used the same or a similar design, applying and adapting it to smaller and larger size plates.[153] Finally, experimentation with the printing ink formula took place as discussed above. By preparing inks with finer grained pigments, the wear on the plate was reduced thereby allowing the edition to be as large as possible. The finer grains also increased the hiding power of the ink lines, making the impressions appear darker.

All this provided so much experience in inking, wiping and printing, that it is conceivable that a distinction could be observed between printing an edition of a plate by someone such as Martin Schongauer and one by a minor master. It is clear, however, that the prints themselves were held in particularly high esteem – although they were more rare at the time than woodcuts, relatively more engravings have survived.[154]

Printing series

From the very beginning, single leaf prints were produced in series such as playing cards or Passions.[155] One in particular is the production of series in booklets, for which two methods are observed. In the first, two plates were printed in one run on one side of a sheet, with one plate being printed on the left half and the other plate on the right half of the same side. In the second, one plate was printed on the right half of one sheet, the sheet turned and the other plate printed on the other half of the verso of the sheet. The sheets of a series are piled up in the right order and folded double, forming a booklet, sewn together with a simple stitch and then traded. A third method was to print four small plates, either in neighbouring pairs or alternating with blank spaces, on the recto of one larger sheet and another four on the verso side, the sheet being folded to a quire with eight folia. Examples of these different manners date from the third quarter of the fifteenth century.[156] Prints could be cut out from the booklets and pasted into manuscripts. However, even though a bound series formed a booklet, texts were also written on the blank spaces underneath and on the versos of the prints.[157] A hybrid form is found when a print is pasted to a stub of a written folium, the two forming a complete sheet of two folia. Several of such composed sheets are piled up and folded to a quire, several quires forming a kind of blockbook.[158]

Book illustration

As soon as the early printing techniques had been mastered, experiments were made to combine one graphic process with the other.[159] The first wave of written texts illustrated by printed images appeared in the third quarter of the fifteenth century when engravings and woodcuts were included in manuscripts.[160] This was straightforward, with prints being pasted onto empty spaces in the text or bound with the bookblock.[161]

More challenging for printers was combining printed imagery with printed text. The earliest attempts at printing engravings and letterpress text on the same page were made in the 1470s.[162] The first examples were simple astronomical diagrams,[163] followed by the edition of Giovanni Boccaccio's *De la ruyne des nobles hommes et femmes* (Brugge 1476) by Colard Mansion. In the third and fourth versions of this book spaces are left within the text for the engraved illustrations. In some copies the plates are printed directly onto these spaces; in other copies the prints are pasted onto them.[164]

Apparently Mansion abandoned any further attempts. Nicolaus Laurentii from Wrocław (Breslau), who was active in Florence, showed more perseverance. He began experimenting with printing engravings in between the text in Antonio Bettini's *Monte Santo di Dio* (1477).[165] This publication was followed by Cristoforo Landino's edition of Dante's *Divina Comedia* (1481) (Fig. 42).[166] Nicolaus was apparently confronted with technical problems in the process. With the first book, only one of three illustrations is printed together with letterpress text on one sheet – the other two are pasted in.[167] For the second one he planned to print a hundred engravings with the text, but never got further than nineteen, of which only the first two or three are printed in the text, the others being pasted in.[168] It was easier to print the text and illustrations on different sheets and bind them together afterwards.[169] For his third publication illustrated with engravings, a Ptolemy edition with additional new maps of 1482, Nicolaus Laurentii chose to print the text and engravings separately and join them only in the binding.[170]

Nicolaus's contemporaries Georg and Michael Reyser, working in Würzburg and Eichstätt, solved the problem of registration. Between 1479 and 1491 they published a series of books illustrated with engravings properly aligned with letterpress text on the same sheet (Fig. 43).[171] Others tried combining letterpress and engraving with greater or lesser degrees of success, but it is only from around 1510 onwards that books illustrated with engravings appear more regularly.[172]

Colour

Relief printing in colour on textile has already been mentioned for the so-called Sitten tapestry, which combines black and red ink.[173] In the second half of the fifteenth century, type fonts and woodcuts were printed monochrome in red or gold, and polychrome in black and red, blue and red, or yellow and black, and occasionally in combinations of more colours.[174] Intaglio printing followed closely, technical advances continued to be made and by the 1460s and 70s, the first experiments with printing engravings in colour had been carried out.[175]

It should be noted that we are not discussing the various hues of black referred to in literature as greyish black, greenish black or brown black.[176] Such hues can be explained, respectively, as due to transparency of the ink (coarse pigment or thinly printed), the yellowed binder (black and yellow give a green), or thin varnish, which bleeds from the ink and turns it brown. Observations such as these relate to qualities of black inks and have nothing to do with colour inks. Furthermore they show there was no uniformity in the ink formulae.[177]

The oldest known intaglio colour print is already a curiosity in itself: *The Madonna with Child in a Garden* by the Master E.S. (Lehrs 2, 130, 70), made about 1465–1467 (Fig. 44).[178] The plate was printed with white ink on black prepared paper and was indeed engraved with the intention of printing in white, as is shown by the highlights on the tips of the noses and by the whites of the eyes with pupils left. A negative of this print confirms that the impressions show the intention of the master. His reasons for using such a process are unclear however. There is nothing similar in intaglio printmaking either by him or by any other engraver in the fifteenth century. An example may have come from drawings heightened in white or pale yellow on coloured papers, a technique found already a century before in Italy and which became popular in the northern Renaissance. One suggestion is that the print was intended as a model for engravers in mother of pearl, but until further information becomes available this print may be viewed technically as an experiment for personal interest.[179]

A small number of engravings made between 1460 and 1530 are recorded as having been printed monochrome in green, blue, brown or red (Fig. 45).[180] Dating should be viewed with some scepticism as colour printed copies can be later impressions not always produced under the supervision of the masters themselves; they may also be posthumous.[181]

Another phenomenon is printing on coloured paper – not paper made from coloured pulp, which was used for intaglio proofs from the second quarter of the sixteenth century, but paper brushed with a colour.[182] Examples are the previously mentioned *Madonna*, while the German Master L.Cz. and Nicolaus Alexander Mair von Landshut are known for washing their prints with grey, brown, blue or green watercolours.[183]

Etching

Printing etched iron plates in intaglio appeared by the mid-1490s and prints from etched copper plates arrived on the scene two decades later. The etching of iron printing plates flourished for half a century only to give way to etching copper. This metal allowed etching to be combined with engraving and demonstrated its great versatility in the following centuries. Possible forerunners of etching intaglio plates, the use of iron printing plates and the start of etching copper are discussed below.

Basics

Metals, stone, glass, ivory and bone can all be corroded by an etchant, either a mineral acid or a solution of various salts in strong vinegar, and occasionally lye is used. There are three ways of creating a design on the object to be etched. The simplest is to brush the design with an etchant on the surface of the object. This corrodes the material giving some discoloration or matting of the surface of the object, but does not create a relief. A more effective method is to first paint the design on the surface with a resist, such as molten wax or oil paint. The unprotected parts are then bitten away. The third method is to completely cover the surface of the object with a resist, draw the design into it with a needle and etch the bare material. Both of these last two methods create a tangible relief and both techniques are described from early on in the sources. Objects decorated with such forms of corrosion are found in many parts of the world.

Etched stones in India
Materials required for etching are commonly available, the chemical reactions are identical and it is therefore easy to imagine finding forms of etching from different places and times.[184] An early example is the etching of semi-precious stones such as carnelian or chalcedony used for beads. Etching is done with an alkali and the effect is local discolora-

tion of the surface; there is no relief.[185] The oldest of such objects come from the Middle East and date from before 2700 BC. Through trade they spread from the west to the east of Asia and the technique is still used in India (Fig. 46).[186]

Etched bronzes in China
Chinese bronze mirrors, swordblades and spearheads from the mid-fifth century BC (late Chou and Han periods) have typical etched patterns. The metal shows matting or a lighter discoloration due to chemical changes where they are corroded, and etched patterns on the blades have a shallow relief.[187] What processes were used is unclear, but creating patinas on metal surfaces by means of acids or a salts solution, so called 'pickling', is universal and can, for example, be observed with Egyptian blackened copper alloy objects from the second millennium BC.[188]

Closer to true etching are inscriptions in intaglio found in a number of late Chou (fourth to second century BC) bronze vessels that are of such a character that they cannot be easily explained as having been made by casting or engraving (Fig. 47).[189] The bottoms of the grooves are rounded and coarse, which excludes engraving or chasing, while the edges of the grooves are irregular and undercut, which excludes casting. This suggests an etching technique that combined a ground and a mordant.

Etched shells in Arizona
On the other side of the Pacific etched marine shells are found associated with a tribe that once inhabited the Gila River valley, north of the Gulf of California, in what is now the state of Arizona. The people, called the Hohokam by archaeologists, may have inhabited the valley from the fourth century BC until after AD 1400. The Hohokam decorated shells by carving, cutting and painting, but occasionally the shells show a relief that is clearly etched (Fig. 48). The etching is evidenced by the irregular edges of the grooves, rounded corners and undercutting of the edges. Several objects found have remains of the pitch used as a resist. The chalk of a shell is easily corroded by a mild acid and a test showed that painting a design with a resist and leaving the shell in the fermented juice (vinegar) from the local *saguaro* cactus fruit for three days was enough to produce the same results as observed in the originals.[190]

Pattern welding

The above examples are incidental and isolated in place and time; there are no mutual connections and there are no developments towards modern printmaking. The techniques of 'pattern welding' and 'copper plating iron' are more likely to be candidates as the direct forerunners of etching.

In Europe, before and during the early Middle Ages, iron swordblades and spearheads were produced by so-called 'pattern welding'. The technique is still in use in some Asian countries, the most famous being the Japanese swordblade and the Java kris.[191] With the earliest European forms of this technique, strips of harder carburised (0.3–0.6% carbon) and softer (almost carbon-free) iron were hammer-welded into a bar and next folded double and forged into a tough blade.[192]

Pattern-welded weapons are found in the fourth century BC (Etruscan examples) and in the second century BC (Celtic examples). The technique developed further from the second century AD onwards and flourished during the Merovingian and Carolingian periods with export to eastern Europe in later centuries.[193] Pattern-welded swords gradually disappeared after the Carolingian period only to re-emerge in a more refined form by the end of the Middle Ages. By that time a number of thin steel plates were hammer-welded together, chisel-cut in the middle and the steel bent back over itself, a procedure that could be repeated several times.[194]

Diodorus Siculus
A reference to exposing iron to a mild acid is found in Diodorus Siculus (fl. 60–30 BC).[195] He described the swords of the Iberian Celts as 'two-edged and wrought of excellent iron'. According to him, the technique was to bury 'plates of iron in the ground and leave them there until the rust has eaten out what is weak in the iron and what is left is only the most unyielding, and of this they then fashion excellent swords'. Humic acid in combination with oxygen present in the soil would have caused the iron to rust. By scraping off the rust, a piece with a higher proportion of carburised iron is left, which can be forged into a tougher blade. Thus interpreted, this passage does not seem to refer to pattern welding of the swords themselves, but to an intermediate stage in the process of preparing a harder quality iron with veins where the softer iron was removed.

Another misconception about etching may arise from the observation of iron swords excavated after two millennia and then cleaned and further prepared. We do not have pristine, polished and patterned blades going back two millennia; we do not know what they looked like originally. A centuries-long sojourn in a mild acidic environment may create a form of relief due to the differences in chemical behaviour of the two kinds of iron. Subsequent conservation treatment may further result in a particular effect that we may now appreciate, but which is very different from the

object's original appearance.

Cassiodorus
The advantage of pattern welding is that the process created multilayered blades that were both tough and capable of retaining a sharp cutting edge. The smith could also fold, twist and hammer the iron of the blade in various decorative patterns that he could reveal by polishing or by etching the metal.[196] How the European mediaeval smith did this is unknown, although the general acceptance is that the blades were etched as this gives the best results. A possible reference to etching may be found in a letter that Cassiodorus, secretary to Theodoric the Great, king of the Ostrogoths, wrote to Thrasamund, king of the Vandals, sometime between 523 and 526. Thrasamond sent two swords as a present to Theodoric. Cassiodorus thanked him and described how shiny they were, how smooth their edges were shaped and that 'the centres are hollowed out with beautiful grooves, (that) seem to undulate with worm-like marking'.[197]

In order to distinguish between carburised and non-carburised iron, differences in shades of colour are enough. Colour hues are created by polishing followed by rubbing the metal with a weak acid.[198] The terminology used in the literature on pattern welding may cause misunderstandings here. Commonly the term 'etching' is used, while the action of the acidic fluids would only have been superficial. The term 'micro-etching' would be more appropriate, in the sense of merely changing (matting, discolouring) the surface of the metal instead of creating a tangible relief by true etching.[199]

Just leaving iron in a bath of vinegar is not effective as the vinegar is not sufficiently acidic to attack the metal rapidly. The iron discolours due to micro-etching, but a tangible relief is not created. Suspending an iron object above a vinegar bath to expose it to its vapours in combination with oxygen in the air makes it rust quickly. When the rust is brushed off after a week it leaves a shallow (>0.1 mm) relief. It is conceivable that a similar action continued for a month or longer would corrode the weaker iron in a pattern-welded blade more than the harder iron. After cleaning and polishing a pleasing structure will appear.

Etched Celtic blades
The exception is a kind of decoration practised by mid-European Celtic smiths. Iron weapons have been found in Celtic burial mounds and dredged from rivers. The hoard found close to the village of La Tène on Lake Neuchâtel in the west of Switzerland dates from the second and first century BC and is particularly relevant to the present discussion. The swordblades are skilfully decorated using a variety of means among which etched decorative reliefs are conspicuously present (Fig. 49).[200] Some of the blades show clear and tangible raised geometric elements with smooth surfaces and rough edges, while the bottoms of the recessed parts are coarse. Such effects are typically due to systematic etching and can only have been produced by partially covering the metal with a resist, such as molten wax or pitch, and etching away the iron around it.

Copper plating

It is tempting to think that there might be some kind of relationship between the pre-Christian Celtic swords with their rather simple etched reliefs, and late mediaeval blades and armour with their elaborately etched figuration. Both concern iron swords decorated by means of etchants/mordants and resists, and were produced in about the same region. However, the distance in time is large, spanning 1500 years during a turbulent period in European history. A more direct predecessor of the late mediaeval etching of armour, and thereby of the beginning of etched printing plates, is a form of copper plating used in gilding iron.[201]

Mediaeval recipes
Many mediaeval recipes document a kind of gilding process (*deaurare*) during which the object is immersed in a copper salt solution. Due to electrolytic action between the copper ions in the solution and the iron object, metallic copper is plated onto the iron. This layer of copper serves as a ground upon which leaf gold is applied, but the copper plating itself may also have been used on its own merits.[202] The oldest known recipe for this manner of gilding is found in the Lucca manuscript from *c*.800. Equal parts of *calcitarim*, alum and common salt are mixed, and the mixture then dissolved in water.[203] Together with another part of gum tragacanth this produces a gel that can be applied onto the iron object locally, the gel keeping the solution in place.[204]

The Heraclius manuscript (tenth century) has a number of gilding recipes, two of which instruct the craftsman to cover iron with a layer of copper before actual gilding. In the first recipe, three parts of *atramentum* and one part of common salt are dissolved in vinegar. The iron object is placed in the solution and is plated with copper. The other recipe prescribes *calcanthum*, alum and *sal gemma* (common salt in a particular crystalline form) in vinegar (as in the Lucca manuscript) – a recipe that can be found in a number of varieties until the eighteenth century. Thereafter the copper is cov-

ered with gold dissolved in mercury, heated, the mercury evaporates and the gold is left on the surface.[205]

Chemistry

The chemistry behind these recipes leads us to actual etching. Terms such as *calcit(h)ari(u)m*, *atramentum*, *c(h)alcant(h)um*, *vitriolum*, and probably also *colcothar*, are expressions used to describe impure salts containing various sulphates. They would have been rich in soluble copper(II) sulphate ($CuSO_4$), the source of the copper for the plating.[206] A solution of copper(II) sulphate and kitchen salt in strong vinegar first plates copper onto the iron in a few seconds and upon prolonged exposure continues to bite away the iron.[207] The above gilding recipes are therefore also suitable as etchants/mordants for iron.

The salt solutions were not intended for corrosion at the time, however, and their potential for etching metal was recognised only much later. Such prescriptions can therefore be referred to as 'pre-etching recipes' because the solutions were potential mordants although they were not used as such. Recipes for the deliberate corrosion of iron by means of a salts-in-vinegar solution, in combination with a resist, are found from the fifteenth century; they are usually intended for etching a name or a simple decoration in a knife or sword.[208] One step further is the decoration of arms and armour. It would therefore have been just such a kind of etchant that was used by Daniel Hopfer for etching intaglio printing plates starting in the mid-1490s.[209]

Nitric acid

Another way of etching metals is by means of nitric acid. The oldest Occidental recipe for the distillation of a mineral acid is found in the Italian manuscript *Liber de inventione veritatis* from the end of the thirteenth century.[210] The recipe explains how to distil dry one pound of (unspecified) vitriol with half a pound of saltpetre and a quarter of a pound of alum. The distillate has a strongly dissolving property and is therefore nitric acid.[211] The distillation of nitric acid is also known from Byzantine manuscripts from the end of the thirteenth century and from fourteenth-century western European manuscripts.

Islamic science

The name 'Geber' was first used by fourteenth-century Western scholars to refer to an Arab scholar and is derived from 'Jabir'. Although a number of people are called by that name, in our case the most likely candidate is Jabir Ibn Hayyan who worked mainly in Baghdad in the eighth century. A voluminous compendium of treatises known as the *Corpus Jabirianum* is attributed to him, but most, if not all of the works, were compiled only a century later.[212] The compendium contains a description of the distillation of nitric acid from a mixture of salts; later Islamic alchemical texts also refer to the production of mineral acids.[213] Islamic science was introduced in southern Europe in the twelfth and thirteenth centuries by means of translations of Arabic manuscripts into Latin, and scholars in Toledo were particularly active in this field.[214]

Commercial production of nitric acid

With these technical developments we have arrived at two different methods of corroding metals originating from two different backgrounds: one from practical craft and the other from scholarly research. Etching iron with a vinegar-and-salt mixture is easy – the constituents are readily procurable and just need to be mixed. Nitric acid is well suited for the etching of iron, copper and other metals, but is more complicated to produce because of its distillation process.

Although known in the Occident in the fourteenth century, this did not mean that nitric acid was generally available immediately. This involved production on a larger scale for which we need to look at the early production of gunpowder. Saltpetre is the source of the nitrogen in nitric acid and essential in gunpowder at 75% by weight.[215] Because of the growing importance of guns in warfare in the fifteenth century, there was a greater need for gunpowder and consequently an increased production of saltpetre. As a side effect, nitric acid was produced on a larger scale in Venice from the fifteenth century.[216] Commercial production of nitric acid began in France, possibly also in Germany, in the sixteenth century.[217]

References to etching copper printing plates with nitric acid are found in Italy in the sixteenth century and in northern manuals from the early seventeenth century onwards.[218] From this we may conclude that the acid became a standard mordant for intaglio printmaking in western Europe only after 1600. However, it is not known when nitric acid became a standard mordant in Italy because Italian primary sources on the etching of printing plates are largely missing until 1900.[219]

Etching techniques

The etching of a design in an object or plate requires the combination of a mordant with a resist, as already mentioned. Etching techniques for decorating metal objects will now be discussed as an introduction to the beginning of etching intaglio printing plates.

Early etching recipes

The first recorded evidence for decorating iron, steel and other metals by means of etching a relief of tangible depth comes from a recipe in a fourteenth-century copy of the abovementioned *Secretum philosophorum*. A *corrosivum* is made by distilling 'vitriol' (a sulphate containing salt) with saltpetre, ie nitric acid. Oil paint is applied as resist and after etching the grooves are coloured. This closely resembles intaglio printmaking, when the next step would be printing this colour onto a sheet of paper.[220]

The book *Pro conservanda sanitate* appeared in Germany in 1531. The introduction announces that it is a publication of a manuscript compiled by the French fourteenth-century bishop Vitalis de Furno, discovered by Abbot Laurentius of the monastery of Eberbach and entrusted by him to the publisher. No copy of this manuscript has been found until now and the attribution to Vitalis de Furno is uncertain.[221] The text on distilling a 'water' to dissolve all metals instructs the reader to grind one pound of saltpetre with one pound of vitriol, to mix this with alcohol and distil it with good wine.[222] The second water from the distillation is distilled once more. This colours wool yellow and dissolves or liquefies all metals, calcines stones and the like, which means it is nitric acid.[223]

No reference is made in the recipe to making a relief in metal; this is found only further on in chapter cclxxi, where the etching of iron is explained. Here the mordant is made of charred hazel twigs, copper acetate and urine or vinegar. The object is dipped into molten wax to cover it completely, letters and figures are drawn into the wax down to the iron, and the object (apparently) submerged in the mordant.[224] It is left there for some days until one sees that the letters and figures have been bitten into the iron by the etchant.[225]

Etching methods

More fourteenth-century recipes exist for distilling nitric acid and copper plating iron with a solution of salts. However, in order to recognise a recipe as intended for etching a relief in metal objects, it is important that the recipe also describes the use of a resist such as wax or oil paint. At least ten recipes from five fifteenth-century manuscripts explain how the iron object is either covered with wax, oil varnish or oil paint and the text or decoration scraped into it with a stylus, after which it is etched. Alternatively, text or decoration is painted onto the iron with oil paint and the metal around it etched away.

Ms. Sloane 416 (1424–1456) in the British Museum, for example, has several etching recipes, one of which uses thin oil varnish as an etching ground. The varnish is applied to the iron object, dried above the fire, and when dry the design is drawn into the ground. A wax rim is built around the part to be etched in order to retain the acid.[226] Strong vinegar is poured within the wax rim, the vitriol, sublimate, saltpetre and verdigris added, and the design etched until deep enough.[227]

Another method found in fifteenth-century recipes and later is to mix the etchant with charcoal powder to an acrid paste that is applied to the part to be etched.[228] Both techniques are useful for local etching or etching on curved surfaces. A third suggested method is filling a cloth bag with the necessary salts and placing it on the part to be etched; the bag is moistened with vinegar to etch the metal underneath.[229]

An early sixteenth-century Flemish manuscript has a prescription for etching decorations on knives and armour. The plate is placed in a glazed earthenware tub above a small fire. A glazed earthenware pan with a spout is positioned above it. The tub holds the mordant; the mordant is repeatedly ladled from the tub into the pan above and poured through the spout onto the object to be etched until the etching is ready.[230]

Some practical aspects

Iron is harder than copper and difficult to engrave but can be etched with simple mixtures of various salts in water. Copper, a semi-precious metal, is corroded less easily. Etching copper can be done with nitric acid of 20% or more in volume, but also with a mixture of various salts in vinegar. Although there are no historic references to it, the simplest recipe is a saturated solution of plain kitchen salt in vinegar of 8%, which bites a 0.1 mm relief in copper in about four weeks.[231] This is deep enough for intaglio printing. More complex salt mixtures are boiled in strong vinegar in order to concentrate the solution, which creates mordants that can bite a shallow line in copper in a few hours; such recipes abound from the seventeenth century.

It is difficult to tell from a print whether the plate was etched with nitric acid or a solution of salts, but nitric acid may leave particular traces when sufficient care has not been taken with the etching. Etching with nitric acid produces little bubbles of nitrogen oxides, which cover drawn lines (Fig. 50). By removing the bubbles repeatedly, the grooves are etched cleanly otherwise they sit on top of the grooves, the acid bites around the bubbles but biting is retarded at the places where the bubbles sit. In the print this may be particularly apparent in areas with close hatching – the impression of the hatched area will be erratic, and the weaker or greyer parts will show as lighter disks of a few millime-

tres in diameter surrounded by darker rings (see Fig. 56; see also Fig. 132, p. 156).

Etched iron objects
A Spanish sword is believed to be the earliest known etched iron object from the pre-modern period and therefore represents the beginning of the development of modern etching processes.[232] The sword was found in the tomb of King Sancho IV of Castile and Leon in Toledo and is dated c.1290. The inscription on the blade just under the hilt is, according to Oakeshott, 'undoubtedly produced by true etching' and the introduction of Islamic science in Toledo in this period (see above) supports knowledge of etching at that place and time. Oakeshott also refers to a possible second Spanish example and shows two Italian blades with etched decoration from the fourteenth century.[233]

Paulus Paulerinus (c.1463) describes the craft of the *sagittinus* who made missiles and other weapons.[234] The *sagittinus* embellished his weapons with texts and images, which he etched into the iron by means of a solution of salts using red oil paint as a resist.

Decorating armour by means of etching was practised in Italy, Spain and the German states throughout the fifteenth century, with an increase in activity in the last decades.[235] Etched decoration of arms and armour became more and more popular with the skills of the armourer reaching their apex in the sixteenth and seventeenth centuries.[236] In that period etching was used for decorating a variety of objects such as dishes, locks, beakers and tools and in different materials such as pewter, bone, ivory, stone, iron, copper and silver.[237] Etching objects became so common that there are a plethora of recipes.[238]

Etching iron printing plates

From the above it is clear that decorating metals – and other materials – using etching techniques flourished around 1500 and with that knowledge so widely available, the next step in the development of the technology, ie etching printing plates, was relatively straightforward.

Leonardo da Vinci
The earliest dated recipe for etching a metal printing plate is found in the Codex Madrid II, written and drawn by Leonardo da Vinci. On a page dated 1504 he explains his ideas for etching a metal plate in relief, not in intaglio, for reproducing his designs in order to print them as book illustrations. He begins with the instruction to take an 'iron' plate (*piastra di ferro*), but twice later on in the same text he talks about a 'copper' plate (*al rame, col rame*). He does not make clear how the plate should be prepared – he simply says to 'hollow out' the plate (*cava il canpo col modo tuo*).

The manner in which Leonardo proposed to draw on the plate is clearly a 'lift-ground' technique: the metal is covered with a water-soluble layer of the white of a raw egg, the design and letters are scratched away in this layer, and the whole is covered with a mixture of oil varnish and yellow or red lead. Next the plate is soaked in water by which the egg white dissolves, uncovering the surface except where the varnish is painted directly onto the metal. Information on similar lift-ground methods was widely available and Leonardo almost certainly adapted one recipe or the other to his own ideas.[239]

Further treatment is the previously mentioned 'hollowing out', by which only etching can be meant.[240] Leonardo did not describe any mordant but he probably had nitric acid in mind because he certainly knew about it.[241]

Leonardo's ideas did not get beyond his notebook. The technique was never used to make the printing plates for illustrating any of his books and he probably did not communicate the idea to any of his contemporaries.[242]

Daniel Hopfer
By the mid-1490s, the Augsburg armourer Daniel Hopfer started etching flat iron plates in order to print them like copper engravings.[243] Engraving printing plates had developed within a few generations to a mature and refined technique, which took years to master. Compared to engraving, etching is easy and fast, and Hopfer opted for the easier route.[244]

That Hopfer used iron and not copper is evidenced by the plates themselves, of which a number are still extant, and by the restrikes that were carried out through the centuries.[245] Typical for iron printing plates is the presence of rust stains in later impressions. Iron plates kept over a longer period without sufficient protection will develop rust so entrenched that it cannot be removed without damaging the etched lines. Material has to be removed leaving a typical pitted structure. Later restrikes of etched iron plates therefore often show conspicuous rust stains, something that does not happen with copper plates.[246]

Hopfer was the first to etch intaglio printing plates. The etching needle allowed him to draw in a free or less precise way; he did not reproduce the more controlled working manner of copper engraving. In addition, his prints show his versatility with the new medium. He used needles with chisel-shaped tips of two or three widths; he was the first to apply biting in stages; he etched black letters against a white background, as well as white floral decoration and letters against a black background; and was far ahead of his time producing prints with tonal etching as a forerunner of

later aquatint techniques (Fig. 51).

He would have made tests first before applying his techniques, nevertheless their application looks so professional that his prints cannot really be called experimental. For example, his use of etching needles with straight tips of different widths may have come from the armourer's workshop. This technique was used by only a few etchers after him, such as his son Hieronymus Hopfer, the engraver C.B. who worked for Hopfer, Augustin Hirschvogel and Nicolaas Hogenberg, the latter two etching on copper.[247]

The biting in stages is really Hopfer's invention.[248] This method was used again, if not reinvented, by Hieronymus Cock in the 1550s, after which this technique became standard in etching. Tonal processes such as Hopfer's were used occasionally throughout later centuries until the invention of aquatint in the eighteenth century.[249]

Followers
Daniel Hopfer had been producing etchings on iron in Augsburg for some 20 years before Albrecht Dürer, in Nürnberg, tried his hand at the new process and etched six iron plates between 1515 and 1518. Albrecht Altdorfer produced a number of etchings on iron in Regensburg from around 1520, as did his brother Erhard. Hans Burgkmair the Elder made only one etching on iron in c.1517–1520 and Hopfer's sons Lambert and Hieronymus made a number of iron etchings in the 1520s, all three in Augsburg. Dürer's pupils Hans Sebald Beham, Barthel Beham, Heinrich Aldegrever, Augustin Hirschvogel and Iakob Binck made etchings in Nürnberg after their master stopped etching.

Etchings on iron are only rarely found outside of Germany. The first by a non-German artist is the portrait of the young Charles V by Jan Gossaert, active in the Netherlands, which is dated '1520' in the plate (Fig. 54).[250] A print of a *Girl Washing Her Feet* by the Swiss engraver and mercenary soldier Urs Graf was long seen as the first dated etching because it bears the date '1513' but this is thought to be antedated – production in the 1520s (1523?) would fit better with the rest of his oeuvre.[251] Note that Italian engravers never etched on iron plates; they etched on copper from the beginning in c.1515.[252]

Etching iron printing plates relied on mediaeval technical knowhow and the metal soon revealed its limitations when compared to what could be achieved working with copper. The process disappeared again before the middle of the sixteenth century being completely surpassed by the use of copper for etching.[253]

Etching copper printing plates

The period 1515–1525 saw the change from etching iron to etching copper intaglio printing plates. This proved to be crucial for further developments, such as the decline of woodcut within a century to be replaced by the new process, and with an impact that has lasted until today. Albrecht Dürer failed to raise the technique of etching iron to new levels, preferring to remain with engraving copper. As a consequence he left the new technique to his pupils who lacked his genius to develop it any further and Germany lost its pre-eminence. Lucas van Leyden communicated his etching technique to artists in the southern Netherlands, whose inventiveness secured further developments. Italian etchers followed a parallel course in this period and obtained similar results but slightly later.

The years 1520 to 1524 are all important as the turning point in the history of intaglio printmaking and by 1525 developments are clear. The limits of etching iron had been reached, further possibilities were exhausted and the process disappeared within a generation. Etching on copper was the future – the metal allowed additional engraving, biting in stages, scraping off mistakes and re-biting, as well as a whole range of other working procedures to be developed in the coming centuries.

Marcantonio Raimondi and Lucas van Leyden
Marcantonio Raimondi made a series of 30–40 etchings with additional engraving in the period 1515–1520.[254] Raimondi did not exploit the possibilities of the new process – perhaps to economise on time as the etching technique is faster than engraving – instead attempting to make his prints look like engravings (Fig. 52).[255] Lucas van Leyden produced six etchings in 1520,[256] adding engraving to the original etched design in order to smooth the transitions from shadow to light, to enhance contrasts and for heads (see Fig. 53).[257]

That Raimondi and Lucas used the two techniques on one plate can be distinguished by examining the ends of the lines. Etched lines have blunt ends whereas engraved lines are tapered on both ends, or tapered on one end and cut off straight at the other end. Another distinction is that between the free and the restricted movement of a line – engraved lines curve only slowly, while etched lines can be drawn freely. Iron was too hard to engrave with the same dexterity as copper with the burins of that time. The tip of a burin could be made sufficiently hard but it would be too brittle for extended engraving because the metal would not be tough enough and the tip would break off quickly.[258] From the combination of etching and engraving in one print, and the absence of rust stains in their etchings, we may conclude that their plate metal was copper.

Availability of materials and technical knowledge

The rare etching of copper in the first decades of the sixteenth century may be related to the limited supply of nitric acid available and the absence of an alternative mordant. The northern etchers Lucas van Leyden and Dirck Vellert would have used nitric acid – and Frans Crabbe certainly did – as suitable salts mordants had yet to be developed. Their plate formats were small as were the number of plates they produced. Nitric acid may not have been easy to acquire in Flanders and therefore is likely to have been expensive.[259]

Vasari mentions etching with either nitric acid or a solution of salts, and Cellini is the first to give a recipe for etching a copper printing plate with salts boiled in vinegar, both of which were published in 1568.[260] This indicates that etching copper in Italy developed faster than north of the Alps, as is also demonstrated by the larger number of Italian etchings dating to before 1600. Northern references to etching copper printing plates appear only after 1600 when the production of etchings increased and began to flourish there too.[261] Etching copper was initially carried out with nitric acid, recipes for salts-in-vinegar mordants arriving from Italy by 1630.[262]

From documentary sources we learn that availability of information concerning etching iron was not so much of a problem around 1500. There were plenty of etching recipes available and etching reliefs in iron objects had been practised since the thirteenth century. The different salts and the strong vinegar needed were readily available, and resists such as beeswax, oil varnish and oil paint were common.

However, etching copper is more complicated. As mentioned above corroding copper with nitric acid had already been described in the fourteenth century, but anything other than experimental etching of copper had to wait until the production of nitric acid on a larger scale around 1500. The first etched copper plates appeared soon afterwards. As an alternative to nitric acid, salt mixtures were boiled in strong vinegar to concentrate them sufficiently for etching copper, a process that developed in the course of the sixteenth century.

Dissemination of information

The appearance and practice of the etching process in the Netherlands has still not been unravelled because almost no documentation on the subject exists. Several suggestions have been made and the prints themselves provide some hints that are summarised in the following text.

Karel van Mander wrote that Lucas van Leyden was taught etching by an armourer and a goldsmith, but in fact we have no knowledge as to how he started intaglio printmaking or came to etching.[263] A child prodigy he may have been, but it is highly unlikely that Lucas invented engraving, plate printing, the construction of a roller press and eventually etching copper plates all by himself. Also, there were no professional engravers active in Leiden or its wider environs in the early sixteenth century from whom he may have learned the basics of intaglio printmaking.[264]

Dürer was in Flanders from July 1520 to July 1521 and met Lucas in Antwerp in the period 8–21 June 1521.[265] It has been suggested that Dürer explained the etching technique to Antwerp artists such as Dirck Vellert but this is unlikely. Dürer had made six etchings from 1515 to 1518, a minimal output compared to the number of etchings produced by Hopfer and Raimondi. This illustrates Dürer's lack of enthusiasm for the new medium. More importantly, he had etched 'iron' plates, while Flemish artists etched on copper. His knowledge was limited to a mordant for iron, which is not suitable for etching copper.

Lucas etched and engraved the portrait of the deceased Emperor Maximilian I on copper (Fig. 53), and Gossaert etched the portrait of his successor Charles V on iron (Fig. 54), both apparently in the spring of 1520. This would have been lucrative work in the period after the death of the old emperor in 1519 and the crowning of the new one in 1520. But whether the artists were motivated for commercial reasons is in doubt as only one early copy of Gossaert's etching is extant and about twenty of Lucas's prints, all in early impressions. It can also be questioned as to why they used a printmaking technique with which they were not familiar for what should have been prestigious portraits. The answer may be because the portraits were commissioned.

Both imperial portrait prints were made by the best artists in the diocese of Bishop Philips of Burgundy in the same year, the prints have compositional relationships and they were produced using the latest printmaking methods. For these reasons it has been suggested that, with a view to the forthcoming meeting with his cousin Charles V in Brussels, Philips had asked both artists to make the portraits of the past and future emperors as complementary pieces, and that he also encouraged them to use the modern etching technique.[266] If this were the case, it could be considered that Philips was instrumental in passing on information about etching to both artists.

Through whom did the technique of etching copper disseminate? One suggestion is that the Antwerp artist Dirck Vellert, who made his first etchings in August 1522, learned etching from Lucas because they used the same technique and because Vellert seems to have copied motifs from Lucas's works.[267]

The jurist Cranevelt had an interest in craft as evidenced by his note concerning red dyestuff.[268] On another occasion he was invited by Jan Fevijn, in a letter of August 1521, to visit the goldsmith Domenicus in Bruges for a demonstration of the parting of gold and silver from each other.[269] Separation of the metals is done by means of nitric acid, hence one of its alternative names 'parting water'. Because this was a recent invention it would certainly have been of interest to Cranevelt.

Technical information therefore might also have come from the humanist and scholar Frans Cranevelt. Gérard

Geldenhouwer, in a letter written to Cranevelt dated 22 July 1522, stated that he had told Gossaert about his etching on copper. Gossaert had tried unsuccessfully to etch copper with his own etching fluid and had asked Geldenhouwer for details of Cranevelt's mordant.[270] There could be a connection here with Vellert, whose first etchings are dated in the plate '16 August 1522' and '19 August 1522', ie just a few weeks after Geldenhouwer's letter (Fig. 55).

The other early south Netherlandish artist to make etchings in the same year as Vellert was Frans Crabbe van Espleghem, who worked in Mechelen at the court of Margaret of Austria and whose first two etchings are also dated '1522'. Some of his works reveal telltale technical details such as hatchings that show lighter disc-shaped spots set close to each other.[271] As explained above, this is a phenomenon related to nitric acid, which produces gas bubbles during etching (Fig. 56).

The next etcher is Nicolaas Hogenberg who moved from München to Mechelen in 1523 and started working at the court of Margaret of Austria, where he became closely acquainted with Crabbe; the two even cooperated on the same plate.[272] Hogenberg produced his first four etchings in 1524 and, although he came from Germany, he is not known to have made any etchings before he came to Flanders.[273] One particular feature may refer to Hogenberg's German background, however. He used a common needle with a round tip for drawing his designs in the etching ground, as did the other Netherlandish etchers, but he also used a needle with a chisel-shaped tip for broadening lines to enhance the shadows, as did Daniel Hopfer and other German etchers (Fig. 57).[274] That he etched copper and not iron plates is confirmed by the fact that the later states of his *Entry of Emperor Charles V and Pope Clement VII in Bologna on 24 February 1530* are re-engraved and re-etched, and do not exhibit rust stains.[275]

Raimondi, working in Rome, made etchings on copper parallel to Dürer in the period 1515–1520. An (indirect) contact between the two is suggested, but as has been argued in the case of the Flemish etchers, both worked with different materials and techniques, and therefore they are unlikely to have exchanged information on etching.[276] Girolamo Mazzola (Parmigianino) was the first Italian to follow Raimondi's technique. He may have learned the technique of etching with additional engraving from Raimondi when both artists fled to Bologna after the sack of Rome (6–14 May 1527).[277]

In summary, when materials and technical knowhow were available, etching printing plates began either because of an inquisitive mind (Leonardo), for reasons of economy (Hopfer, Raimondi), due to exchange of information in intellectual circles between a scholar and an artist (Cranevelt to Gossaert, perhaps to Vellert), or perhaps instigated by a patron of the arts (Gossaert, Lucas). Once established, knowledge on etching circulated among artists (Lucas, Vellert, Crabbe and Hogenberg, and Raimondi to Parmigianino).

Dissemination of Intaglio Printmaking Techniques

> Every Country, yes every Master of one and the same Town, has his own special manners
>
> *Pieter Holsteyn II*[278]

Although antecedents of engraving and etching can be found throughout the world and from prehistory onwards, the focusing of various skills and materials towards the new discipline of the intaglio printmaking technique has a western European provenance. In this section the origin of intaglio printmaking in the Upper Rhine area and its subsequent dissemination throughout Europe and to other continents are sketched. The first attempt of its kind, it is limited in character, summing up rather than analysing and discussing data, due to the fact that information is scarce and largely lacking because of the absence of further research outside Europe. Nevertheless I believe it is a worthwhile exercise as the following text helps to place local activities in their global and chronological context. The balance of the present study discusses developments in Europe on the premise that practising intaglio printmaking in other countries followed or was based on the European example until the twentieth century, when American and Japanese technical and artistic developments began to influence and overtake European printmaking. Comparison to situations elsewhere in the world is made only incidentally in order to show parallel developments, local phenomena or the present situation.

Dissemination within Europe, and to Asia, Australia and the Americas

The pattern of early dissemination of intaglio printmaking techniques is related to cultural, political and religious aspects, as well as trade routes. The Upper Rhine area, where intaglio printmaking originated, is Alsatian territory, which was under influence of Burgundy in the fifteenth century. Flanders was politically part of Burgundy and also culturally connected, which explains the early appearance of engraving in that region.

If we look for technical predecessors the regions south and north of Basel are particularly interesting. Celtic swords with etched geometric patterns (second century BC) are found in the area around Lake Neuchâtel, 75 km south of Basel. The earlier of the two existing comprehensive *Mappae clavicula* copies (ninth century AD), with pre-etching recipes, is kept in the town library of Sélestat, 75 km north of Basel between Colmar and Strasbourg, and is considered to have a provenance in this region. The Rhine is the most important trade route in that part of Europe. The river is navigable from Basel northwards and it is along the Rhine that we see the dissemination of intaglio printmaking to the Middle and Lower Rhine areas.

Intaglio printmaking developed in the region north of Basel in the 1430s, spreading further north and east through Germany and west to Burgundy.[279] It moved to Italy after the middle of the fifteenth century, with some examples being found elsewhere, and then disseminated throughout central and western Europe (Fig. 58).

During a few decades around 1600, Jesuit missionaries trained Japanese artists in engraving and they introduced intaglio printmaking into China and South America in the eighteenth century. European craftsmen and artists brought intaglio printmaking methods to European settlements and colonies in the Americas, Asia and Australia (Fig. 59). They were probably not introduced in any African country before 1900.[280] An exceptional case is Japan, where local artists taught themselves the technique of etching by means of European written instructions and prints, without any support from Western artists, from 1783.

American engineer Jacob Perkins was the first to reverse this dissemination stream with the introduction of his steel engraving methods and machines in England in the early nineteenth century. James Whistler was the first American etcher of importance working in Europe and his ideas on plate printing strongly influenced his contemporaries. Intaglio printmaking became practised worldwide in the course of the second half of the twentieth century and consequently now information is disseminated widely.

Europe

Summarising the first decades of intaglio printmaking history, about twenty copper engravers were active in Burgundy, in southern Germany, north along the Rhine, and perhaps even in Flanders, until the 1450s.[281] The first intaglio roller press came into use in the Strasbourg area in the early 1460s.[282] The first Italian engravers were probably the Master of the Larger Vienna Passion and Baccio Baldini, both in Florence, with Andrea Mantegna in Mantua. All three were active in engraving by 1460 or shortly afterwards. The first use in Italy of a roller press is observed in both Florence and Mantua by 1470. From here intaglio printmaking disseminated to Ferrara and Bologna, spreading further across Italy north of Rome.

Along which lines the new discipline was communicated to the Italians is unknown, but itinerant German craftsmen may have been instrumental, as well as Italian artists crossing the Alps.[283] It is interesting in this respect to read that the German engraver of type font, Konrad Sweynheym, trained Roman workmen to print the plates for Ptolemy's *Cosmographia* in 1474–1477.[284] And there is the suggestion that Francesco Berlinghieri, editor of the first Ptolemaic atlas published in Florence in 1482 (see Fig. 20), had been in contact with Sweynheym in 1476.[285] Intaglio printmaking developed only slowly with altogether less than a hundred engravers being active in the fifteenth century.

Intaglio printmaking activities in France and Spain (see Fig. 19) were limited at this stage.[286] The new discipline further developed under German and Italian influence in France after 1500, and was introduced in England by Flemish engravers by the 1540s.[287] Other European countries followed, either because local artists travelled west or south to study, or because engravers were invited to work in northern or eastern Europe.[288]

Typical in this respect is the German (?) painter Johann Detterson who taught Western art techniques in Moscow in 1643–1655.[289] His student Simon (Ssemjon) Ušakov was the first Russian artist to make etchings.[290] Another example is that of Czar Peter the Great's visit to Holland in 1697–1698 when he met the Dutch engraver Adriaan Schoonebeek. The czar made an etching under Schoonebeek's guidance[291] and invited the engraver to come to work in Russia. Schoonebeek accepted the invitation and moved to Moscow by the end of June 1698 to set up a printshop. He died there in 1705 when his stepson Pieter Picaart took over the business, moving the printshop to St. Petersburg in 1714.[292]

The Islam convert Ibrahim Müteferrika from Hungary imported copper plates (and therefore likely also a roller press) from Austria and practised intaglio printing in the Ottoman Empire between 1719 and 1742.[293] It probably had little effect on Turkish artists, because in 1806 the Ottoman government ordered a series of *Portraits of the Emperors of Turkey* to be made by the engraver J. Young in England.[294] The first Turkish practical manual on intaglio printmaking seems to be the 2012 translation of Henrik Bøegh's manual.[295]

Iceland was the last European country to embrace intaglio printmaking when Gudmunder Einarson imported a roller press in 1920 following his studies in Germany.[296]

Asia and Australia
Japan
Four young Japanese men, known as the Tenshô Embassy, were taken by the Jesuits to Europe in 1582 and returned

to Japan in 1590. They carried back with them a typographic press that was probably acquired in Lisbon in 1586.[297] The first book printed on this press in the Western manner but in the Japanese language was: *Sanctos no gosagueo no uchi nuqigaqi* (*Excerpts of Saints' Lives*, Kazusa 1591).[298] The book is in two parts and an engraving is printed on both of its title pages, the two engravings being printed from the same plate. The prints are technically acceptable, but the plate was not engraved by a professional engraver.[299] The printing of both plates – the first one darker, the second one lighter in hue – is different due to differences in the ink formulae used.[300] Both impressions are homogeneous, however, suggesting that they were printed by a roller press. This would suggest that there was also a roller press available in the seminary in Kazusa in the south of Japan, either imported from Europe or manufactured locally.

Other illustrated books were printed in the Jesuit seminary (*Collegio*) in Amakusa from 1592 to 1598 (Fig. 60).[301] Apart from the book illustrations, a small number of loose engravings were produced in a kind of art school the Jesuits had established within the seminary in Amakusa in about 1592. Japanese artists were trained here in painting in oils and watercolours, as well as in copper engraving and plate printing, in order to produce Christian imagery for proselytising activities in Japan and China.[302] The seminary moved several times until the persecution of the Christians became so intolerable that the school and the printshop had to be moved to Macao, where the Portuguese had an entrepôt, in 1614.[303] The typographic printing of books continued there from 1620 onwards when it was clear that a return to Japan would not be possible, but no engravings are known to have been produced in China before the eighteenth century (see below).[304]

Japan was almost completely isolated (*Sakoku*) from 1639 to 1854.[305] Information on Western arts and sciences trickled in through the Dutch factory in Nagasaki in the form of Dutch books that a small group of Japanese scholars studied diligently. The first Japanese artist to make etchings, Shiba Kôkan, for example, stated that he taught himself etching through the study of Dutch texts and prints. His mastery of the Dutch language was poor, but he was helped by Ôtsuki Gentaku, a scholar of Western knowledge (*rangaku*, literally 'Dutch studies').[306] Kôkan made his first etching, a *View of Mimeguri, Edo* in *Tenmei Mizunoto U ku-gatsu* (corresponds to 26 September–25 October 1783), as is stated in the lower left margin of this print (Fig. 61).[307] Apparently he used local materials for etching and printing but he etched his plates with nitric acid imported by the Dutch.[308]

Whether Kôkan and his followers relied on Dutch information only to learn intaglio printmaking is in doubt as there might be a connection with the craft of making guards (*tsuba*) for the famous Japanese swords.[309] For these sword guards, small metal plates were skilfully decorated with a variety of techniques. *Tsuba* makers used etching from the late seventeenth century onward to lay bare the internal structures of cast iron objects, to pickle alloys (such as *shakudo* and *shibuichi*) in order to create particular textures and patinas, and to deep etch (*kusarakashi*) brass using a stopping-out varnish. The metal was etched in a solution of a mixture of salts, such as copper acetate, copper sulphate, kitchen salt and sulphur in water or vinegar.[310]

Where this particular knowledge came from is open to discussion, but the recipes reflect a Japanese description of etching by Hakuun in his manuscript *Saikai-hou* (before 1814) on Western painting methods. He speaks about a mordant that is a solution of various chemicals and rat droppings in water. Etching takes four to five days and after the plate is taken out of the liquid the sediment has to be removed.[311] Hakuun is clearly describing some kind of corrosive other than nitric acid because the latter works fast and does not leave any sediment.

From Kôkan's pioneering work a true Japanese school of etching with almost a hundred artists developed, only to dwindle again by the late nineteenth century (see Fig. 299, p. 371).[312] The definite change came with the arrival of Italian engraver Edoardo Chiossone in January 1875. Well trained in the graphic techniques of his time and an international authority on the production of papers of value, he was invited by the Japanese government to reform the production of paper currency. Not only was Chiossone successful in this endeavour, he also introduced modern intaglio printmaking techniques in Japan.[313] In the next decades Japanese young men came to study in Europe and artists from the following generations ranked among the world's finest printmakers.

China

The introduction of intaglio printmaking in China was somewhat different from that in Japan.[314] The Jesuit mission in China established a certain position at the imperial court and was responsible for the production of three books on Western mechanical knowledge for a Chinese audience in the first decades of the seventeenth century.[315] These books were kinds of encyclopaedia with selections of the works by engineers Ramelli, Besson and Zonca. The latter's chapter on intaglio printmaking is illustrated with an interior view of a plate printshop in the original.[316] But this text does not seem to be translated and the illustration is not reproduced in any of the Chinese books.

The Italian Jesuit missionary P. Matteo Ripa stayed in Beijing from 1711 to 1723. Ripa was a painter and not an engraver, but nevertheless had enough knowledge of etching to be able to give a demonstration of the process to the emperor shortly after his arrival or perhaps in 1712.[317] The emperor was pleased with the first results, but asked Ripa to master the technique of engraving with a burin, too, because he had seen Western engraving and liked the style. Ripa experimented with the technique to gain more practice, procured the necessary chemicals for etching and made a series of thirty-six landscapes of the emperor's estate in Jehol. He does not seem to have had a roller press at his

disposal in the beginning, so the plates would have been printed manually by means of rubbing; later a roller press was built in China.

Between 1717 and 1719, Ripa's printmaking activities grew to such a level that it became a larger undertaking, for which he trained Chinese assistants, but this was not to last. The French Jesuit P. Benoist supervised the engraving of a new map of China, plus Manchuria and Russia, in the period 1760–1770. All knowledge about etching and engraving from half a century ago had vanished and Father Benoist had to retrain Chinese staff. He himself was not an engraver but he was ordered to produce the atlas in engravings, and he had to educate himself with the help of Western manuals. Encyclopaedias covering Western modern knowledge, such as Diderot and D'Alembert's, would have been available and he may also have used the 1745 copy of Bosse's treatise.[318]

The Chinese emperor K'ien-Long had commissioned engravings after painted scenes of military campaigns west of his empire in the same period. Jesuit missionaries prepared the designs that were sent to Paris where a team of engravers under the supervision of Charles-Nicolas Cochin the Younger produced sixteen plates between 1767 and 1774.[319] Initially it was considered that the plates should be printed on silk, but this idea was abandoned because the results would be unsatisfactory, the woven structure of the silk being too coarse to print finely engraved lines well. Cochin suggested printing on Chinese paper instead, but eventually European paper was used. The copper plates together with an edition of 200 impressions each were returned to Beijing, where the emperor ordered a further edition of 250 to be printed on Chinese paper.[320] Chinese apprentices of Father Benoist produced other engravings or etchings until 1828.

No further intaglio prints were made from that time until the last quarter of the nineteenth century, when intaglio printmaking was introduced for the third time. Western-style art techniques, including etching, were taught in China from around the turn of the century by Chinese artists who had studied the modern arts of their time in Europe. In the turbulent period that followed, woodcut was preferred and etching became part of the curriculum of art academies only after the founding of New China on 1 October 1949.[321]

Philippines

Typographic printshops were established elsewhere in Asia where Europeans settled, but intaglio printmaking was not generally practised. The Dominicans founded a typographic printshop in the Philippines in the late sixteenth century and trained local staff. There is a record of a copper plate being engraved by the first native book printer Tomás Pinpin, but no original impression is known and its attribution to Pinpin is disputed. Regular copper engraving was established in the Philippines only in the eighteenth century.[322]

Indonesia

Unlike the Portuguese and the Spanish, the merchants of the Vereenigde Oost-Indische Compagnie (VOC, Dutch East India Company) were not followed by missionaries. VOC's main interest was in trade, not in conversion, and any such a motive for print publication in their factories was absent.

The Dutch engraver Joannes de Jongh would have had personal reasons for coming to Batavia (present-day Djakarta). He designed, engraved and published the portrait of the governor-general Cornelis Speelman in 1684 (Fig. 62).[323] The plate was sent to Holland, possibly after De Jongh's death in that same year. Only a few impressions exist, the copper plate is still owned by the family and, except for De Jongh himself, there has not been an official Dutch publisher.[324] No further printmaking activities were undertaken in the Dutch East Indies except for etchings made by some visiting Dutch artists in the nineteenth century and the first half of the twentieth century.[325]

India

The Indian traditional cotton gin, a simple apparatus for separating the cotton fibres from the seeds, has a similar construction to the roller press: two horizontal rollers are held between two vertical stands, the lower roller being turned with a crank.[326] It is much smaller than a roller press, less than half a metre high, and not suitable for printing purposes.

The Jesuits imported engravings and illustrated books in India from the second half of the sixteenth century.[327] These were copied or reworked by Indian painters, but intaglio printmaking was not practised then. For the earliest engravings in India we need to look to the activities of Bartholomaeus Ziegenbalg, one of the first Lutheran missionaries in the Danish colony in India in Tranqueber, a district in Tamil Nadu. Before his death in 1719 he published several books printed in the European typographic technique, one or two with an engraved title page.[328] It is questionable whether the engravings were produced locally or imported, however.

The British started map engraving in India by about 1790, but this never reached beyond an initial phase. The East India Company maintained a rigid policy for administrative and commercial reasons, and as a consequence maps were produced in London. Napoleon's threat to invade India prevented any further initiative in 1809.[329]

Another attempt to introduce Western printmaking was made in 1854 with the foundation of the Indian 'School of Industrial Art' for the training of professional artists. The British government took over in 1864 and extended the insti-

tution to twenty-three of such schools in the major cities of India in 1878. Among other Western art techniques, European professors taught engraving and etching to native students.[330]

Indian artist Mukul Chandra Dey went to study in the United States in 1916 and upon his return brought etching to the University of Santiniketan in West Bengal (northeast India) in 1920. Many artists were inspired by his example, further stimulated by printmaking demonstrations at the university by Madam Andre Karpeles, and also in Calcutta.[331] The city of Lahore (part of Pakistan since 1947) had several art institutes where printmaking was taught, with etching a relatively recent addition.[332]

Australia and New Zealand

The British settlement in Australia more or less followed the pattern of other European overseas colonies, when a typographic press was brought into the country by the First Fleet that arrived in New South Wales in 1788. Fifteen years later the Englishman John William Lewin arrived in Australia to make a series of etchings to illustrate two books. His first book, on insects, was published in 1805 and was illustrated with eighteen plates 'drawn and engraved in the colony'. The second book, on birds, was published in 1808 and its eighteen plates were also 'engraved and coloured by the author in the colony'.[333] Other Australian developments in intaglio printmaking are related to engraver Thomas Bock, who was followed by his son, William Bock. The latter also set up the firm of Bock and Cousins in Wellington, New Zealand.[334] Sylvester Koehler's etching manual (1885) was published by the British firm of Cassel, who also had an office in Melbourne.[335] Etching was introduced to Australian Aboriginals in the 1980s.[336]

The Americas

Canada

The earliest American view of the town of Quebec was engraved and printed by Thomas Johnston from Boston (Mass.) after a French original in 1759, the reason being that Quebec was besieged and fell in that year, marking the end of French government in Canada.[337] The majority of eighteenth-century Canadian views were produced in London or Paris, the colony not being considered attractive enough for printmakers and publishers to settle there.

The honour for the first Canadian-made etching may go to *A View of the Falls of Montmorenci* by the Englishman James Peachey. According to the text on the plate, the view was 'Taken on the Ice 1st May 1781'.[338] No contemporaneous impressions are known, but the copper plate was retrieved in 1989 and restrikes pulled. Other prints of his are dated 1781–1784, his second period in Canada. Peachey may have produced the plates in Quebec, but the printing was probably done on his return to London, as it is unlikely that a roller press was available in Canada at such an early date.

Intaglio printmaking started to develop in Quebec after 1790 albeit hesitantly, extending to Halifax and Montreal in the 1810s.[339] Typical of the printmaking activities in this period is the firm of Savage & Son in Montreal, who were active as jewellers, silversmiths, engravers and plate printers.[340] The situation changed drastically after 1850 with the influx of modern printing and printmaking, including steel-engraving papers of value.[341]

United States

The Boston goldsmith John Conny engraved plates for the currency of the colony of Massachusetts in 1690 and on several occasions in the early eighteenth century, which technically speaking would make him the first American copper engraver.[342] The plates just contained text and in a later version 'blazons' were added.

The first figurative copper engraving produced in the English colonies in North America is interesting from both a bibliographical and a technical point of view. It is bibliographically interesting because the portrait of the Reverend Increase Mather by Thomas Emmes is found in the reverend's sermon 'The Blessed Hope' (Boston 1701) and a second state was used in his later publications.[343] This makes them the first North American books with engraved illustrations. Technically it is interesting because the poor printing quality could be explained by the absence of a roller press and that the plate was printed by means of rubbing or perhaps even by the same typographic press that printed the text. Other eighteenth-century North American engravers were gold- and silversmiths who practised engraving printing plates as a subsidiary craft.[344]

Better quality work was produced by professional British engravers who immigrated to America, such as Francis Dewing who arrived in Boston in 1716.[345] He engraved and printed a plan of *The Town of Boston in New England* after John Bonner in 1722. The plate was reworked and republished in 1739, 1743 and 1769, which means a roller press and a capable engraver/printer were both present in Boston during these years.

A more solid base developed due to the immigration of German plate printers in Philadelphia in the 1740s.[346] Nevertheless, although the desire was there, and professional European craftsmen had arrived, and printmaking was active in Philadelphia, New York and Boston by the middle of the century, it was still difficult to procure proper materials, tools and machines. Paper had to be imported from Europe for many years. Dewing carried a roller press with him upon his arrival in Boston. The roller press for printing New Jersey paper money was 'contrived' by Benjamin Franklin in 1728, based on his London experience.[347] John Fitch still printed his plates on a 'cider press' in 1784.[348]

Illustrating Thomas Dobson's *Encyclopaedia* (1790–1797) was the first professional enterprise by which printmaking in the new republic came of age. Its eighteen volumes required over 550 plates, exceeding everything published in Philadelphia up to that time. To be able to do this engravers and printers were contracted from all around the east coast and local apprentices were taken on. The printing paper used was American made, but the provenance of the ink and its raw materials is unknown. The largest American printmaking community was concentrated in Philadelphia but all the plates were engraved due to lack of expertise in etching.[349]

Other encyclopaedias followed Dobson's with apparently fewer difficulties. For example, Rees's *Cyclopedia* (47 vols, 1806–1822) was published by Samuel Bradford in Philadelphia for which 1000 plates were produced by 50 different engravers. In this case etching was also applied (Fig. 63).[350] Minor activities in intaglio printmaking also took place elsewhere but all were limited to the northeast coast of the country.[351]

The first American to have a particular influence on European intaglio printmaking was the civil engineer Jacob Perkins. Starting out as an engraver of steel dies for striking the coinage of the state of Massachusetts in 1786, he designed the first cast-iron roller press (1813) as well as other machinery. He acquired English patents and moved to England to further develop steel engravings for paper currency in the nineteenth century.[352]

Printmaking in general flourished in the nineteenth century and there were a number of excellent American steel engravers.[353] Its use in the arts also grew, developing as the first American etching revival in the 1880s.[354] Philadelphia kept up the tradition when Thomas Bishop published *The Etcher's Guide* in 1879, the first manual of its kind in the United States, preceded only by an article on the etching process by George Lowell Austin five years earlier.[355] The *American Art Review* (1879) announced that 'Miss M. Louise McLaughlin has in preparation, – *Etching. A Practical Manual for Amateurs*'.[356] Despite the announcement this manual never appeared, but three other manuals followed Bishop's soon afterwards, marking contemporaneous American interest in etching.[357]

After this first wave a decline followed due to the influence of the new photomechanical techniques, to be followed again by a second etching revival. James Whistler's death in 1903 stimulated the organisation of at least ten exhibitions in the United States of their first great etcher between 1904 and 1910. This had a lasting effect on intaglio printmaking in the United States.[358]

Mexico

Printmaking activities in the Spanish and Portuguese colonies in the Americas were closely related to European trends. Printshops were established throughout the continent and in the Caribbean from the sixteenth century. With the arrival of a typographic press in Mexico City in 1539, a constant production of books began. Woodcut illustrations seem to have been fairly common at the start, but in the seventeenth and early eighteenth century copper engraving took over, following the European example. Some of the more important achievements are mentioned in the following text.

Samuel van der Straet was probably the first engraver and plate printer in Mexico, the *Virgin of Guadelupe* being his first publication in 1615. His cooperation with typographic printers supports the idea that he possessed a roller press and it is likely that there were other engravers active in Mexico City in the seventeenth century. At least twelve engravers were counted between 1720 and 1800, publishing their own plates and purchasing those of colleagues.[359]

Such activities encouraged engraver Jerónimo Antonio Gil to advocate the foundation of a school for the professional training of engravers in 1781. King Carlos III accepted the suggestion and the school became part of the Academia de las Tres Nobles Artes de San Carlos in Mexico City, with statutes being drawn up in 1784. Despite Gil's enthusiasm the school held little appeal to students – engraving was considered minor to painting, sculpting and architecture therefore the courses offered merely consisted of copying prints.[360] Not surprisingly student numbers dwindled by the middle of the nineteenth century, when the school contracted the established English engraver George August Periam as professor from 1853 to 1858 in order to revive engraving.

Southeast of Mexico City, the town of La Puebla de Los Angeles housed a fairly active printing community that also produced engravings for book illustration. Miguel Amat (fl. 1695) may have been the first to have engraved a printing plate here, several others following him in the eighteenth and early nineteenth century.[361] Mexican printmaking followed European fashion from the late nineteenth century onwards.[362]

South America

Some engravers were active in Guatemala in the eighteenth and beginning of the nineteenth century, commonly working in the production of book illustrations.[363] Engravers in Lima (Peru) began earlier, as a first engraving commemorating the funeral of the Spanish queen Margarita is recorded in 1613. This was followed by further engraving activities up to the nineteenth century.[364]

The Jesuit mission press in the virreynato del Río de la Plata (now Paraguay) published a translation in the local Guaraní language of the popular *De la diferencia entre lo temporal y lo eterno* by P. Juan Eusebio Nieremberg in 1705.[365] The book, a folio of some 480 pages, is illustrated with 43 engravings, a high number that could only have been achieved by printing with a roller press. Juan Indio Yapari and other natives trained by the Jesuits engraved the

plates, thereby following the same pattern as the missionaries in Japan (see above).[366]

Some other engravings were produced in the region in the eighteenth century, but true artistic printmaking flourished in Argentina only from the beginning of the twentieth century.[367] The first South American manuals on intaglio printmaking were also published in Argentina.[368]

The situation in neighbouring Brazil was of a different nature. All contacts and trade between Brazil and the rest of the world went through Portugal. The Portuguese king prohibited any printing in the colony and eighteenth-century attempts at printing were not very fruitful. This situation only changed at the end of 1807. With the threat of invasion of Portugal by Napoleon, the court moved to Brazil, transforming the colony into the headquarters of the Portuguese kingdom. King D. João VI opened up the Brazilian harbours to friendly nations, resulting in a flood of immigrants. The colony flourished and the Royal Academy of Painting was established in Rio de Janeiro – without a printmaking department, however.[369]

Printmaking did not establish itself in Brazil until the twentieth century. Carlos Oswald was born in Florence, Italy, where he first studied as a mathematician and physicist. He then undertook a broad spectrum of artistic training before establishing himself as a multi-talented artist in Brazil. Oswald set up an etching course at the Liceu de Artes e Oficios do Rio de Janeiro in 1914, but regular training was not included until 1930. The necessary tools and materials could be procured only with great difficulty and he even had to make some himself after old recipes.[370]

Modern developments

Nowadays printmaking is studied and practised worldwide. The number of amateur printmakers considerably exceeds that of professional printmakers, a situation in part brought about by the reductions in printmaking facilities in institutional art training in western Europe, northern America and Australia that started in the early 1990s.[371] New developments may come from eastern Europe, Spain, Canada and South Korea, all of which have lively printmaking communities. Also upcoming are printmakers in India, Mexico, Brazil and Argentina.

Notes

1
Hieran schloß sich die Betrachtung daß es eben schön sei zu bemerken, wie Kunst und Technik sich immer gleichsam die Wage halten, und so nah verwandt immer eine zu der andern sich hinneigt, so daß die Kunst nicht sinken kann ohne in löbliches Handwerk überzugehen, das Handwerk sich nicht steigern ohne kunstreich zu werden. Johann Wolfgang von Goethe, 'Wilhelm Meisters Wanderjahre oder die Entsagenden. Drittes Buch', in: *Goethe 1829*, 23: 33.

2
Lowery et al. 1971: 170–174.

3
Clark & Thompson 1953; *Domeier Stafford 1977*; *Sax & Meeks 1995*.

4
Exodus 28:36 concerns engraving text in a gold plate ('You shall make a plate of pure gold, and engrave on it, like the engravings of a signet, HOLY TO YAHWEH'), other biblical references concern engraving in stone or carving in stone or wood; *Hunnisett 1987*, 14(11): 424–425; *Hunnisett 1998*: 4–6.

5
Blümner 1887: 8, 98; *Brack 1485*: fol. XLIIIIr; *Vocabularius 1478*: fol. 56r–v.

6
Passavant 1858; *Schuchardt 1858*: 74–77. For gold and silver printing plates from the sixteenth and seventeenth centuries see Chapter 3, p. 133.

7
See below under 'Etching iron printing plates'.

8
http://en.wikipedia.org/wiki/Bismuth#History (2010); http://en.wikipedia.org/wiki/Antimony (2010).

9
Gieseke 1949.

10
http://en.wikipedia.org/wiki/Pewter (2010).

11
Deleschamps (Paris 1836): 23; **Robert** (Henri; Paris, 2nd ed., 1926): 99–100.

12
Levenson et al. 1973: 526–527. A number of blocks and plates in the Rosselli inventory are cut and engraved on both sides (*da l'altra banda, da l'altro lato*). Noticeable are (no. 71) the *17 pezi di sobile e profeti, dopie* (= double sided), the Sibyls and Prophets after Baldini; *Gramaccini & Meier 2009*: 454–455; *Hind 1938–1948*, I: 307–308. See Chapter 3, p. 152.

13
Bocquentin 1993, 1: 5–6.

14
Zinc was not known in its pure form in antiquity or in the Middle Ages but zinc-rich earth (calamine) was melted with copper to produce brass; *Blümner 1887*: 91–92.

15
Cook 1977; *Hunnisett 1998*: 7.

16
Deleschamps (Paris 1836): 18–22.

17
Barral 1990: 27, fig. 7; *Cole 1983*: 109, fig. 51; *Filedt Kok 1985*: 211, fig. 111a; *Hind 1938–1948*, I: 16; *Landau & Parshall 1994*: 24, fig. 6; *Levenson et al. 1973*: 526–527; *Meusel 1804*; *Parshall & Schoch 2005*: 84–86 no. 9. Hind A.I.75 is printed from a brass plate that is kept in the British Museum, Dept. of Prints & Drawings; *Hind 1938–1948*, 1: 53–54. The print collection of the ETH, Zürich includes a brass plate but it cannot be decided whether or not it is original; *Matile 1998*: 184–185. Further fifteenth-century copper plates are kept by the printroom of the Koninklijke Bibliotheek in Brussels, the Berlin Kupferstichkabinett and the Dresden Kupferstichkabinett.

18
Paulus Paulerinus of Prague, in his manuscript on twenty free arts (c.1463), describes the *ciripagus*, who apart from other printmaking activities, engraves in 'copper' or 'brass' (*sculpens subtiliter in laminibus ereis*), perhaps for intaglio printing. The word *aes* or *es* is used for brass or bell metal (*Glockenspeiß*) in the fifteenth century, but probably could also mean copper, while the general term for copper is *cuprum*; *Brack 1485*: fol. XLVv; *Vocabularius 1478*: fol. 56r. For the Paulerinus manuscript see: Biblioteka Jagiellońska, Cracow, Ms. BJ 257: fol. 190ra (*Ciripagus*); *Cracow 1980*, Ms. 257; *Hadravová 1997*: 55; *Kemke 1890*: 148; *Muczkowski 1835*. Ms. IT. III-10 of the Biblioteca Marciana, Venice, perhaps has some recipes that go back to the last quarter of the fifteenth century, such as recipe number 330, which describes the printing of 'copper' plates (*rame*); **Marciana manuscript** (Gaeta 1570): fol. 157v–158r.

19
Gramaccini & Meyer 2009: 65, 132–133; *Hind 1938–1948*, 5: 102; *Landau & Parshall 1994*: 23–24, 104–107: 386 n. 9. Landau & Parshall argue that a brass plate was specified because of 'ensuring the strength of such a large plate while it was being printed'. This remark is somewhat cryptic; perhaps they are referring to the possibility that a copper plate could break in printing, which is conceivable, but may also happen with brass.

20
Firenze, Archivio di Stato, inv. no. 52, *Magistrato dei Pupilli*: no. 190; *Gramaccini & Meier 2009*: 454–455; *Hind 1938–1948*, 1: 304, 307–308.

21
See Chapter 3, p. 148.

22
See below under 'Printing editions'. See Chapter 4, p. 355.

23
The exception is *The Great Battle*, a plate seemingly produced in the mid-1430s and measuring c.30 × 42 cm; *Bocquentin 1993*: 56–57; *Lehrs 1973*, 1: 287; *Schmidt 1992*: 1.

24
Bocquentin 1993: 45; *Geisberg 1923*: 24; *Gramaccini & Meier 2009*: 454–455; *Griffiths 1990-3, 1991-1*; *Hind 1938–1948*, I: 307–308, in most cases the plate material is not specified, but no. 31 is compiled of eight copper plates; *Landau & Parshall 1994*: 4; *Shestack 1967*: no. 18, 258.

25
The map of the world is the first map in the atlas and is printed from the largest of the plates used for the volume compared with the other maps. The copy in the Herzog August Library, Wolfenbüttel shows that the plate was slightly larger than the present paper format of the bifolium of c.42 × 57 cm; *Berlinghieri 1482*; *Skelton 1966-2*; *Stijnman 2009-1*: 36 no. 21.

26
Landau & Parshall 1994: 104–107, cf. p. 385 n. 127.

27
Silver & Wyckoff 2008: 41, 100–101.

28
Lowery 1971, pl. XIV, XV. Lowery, by means of reconstruction, identified intaglio marks on a bronze scabbard and shield from the English Iron Age as an actual engraving.

29
Pope 1967–1969, 1: 606–609 pl. 114.

30
Zimmer 1995: 4, 6 figs 5–11, 28–30.

31
Blümner 1875–1887, 4: 276; *Daremberg & Saglio 1877–1919*, 1 (2): 792 figs 946, 947; *Zimmer 1995*: 8 figs 17, 31 and 10–11 figs 5, 18, 30–31.

32
Zimmer 1995: 22–25, figs 49–52.

33
Ibid., 15–19, figs 34–38. Compare for similar traces with seventeenth-century French engravings; *Yasui & Kamitani 2011*: 13, fig. 18.

34
Pliny, book XXXIII.xlvi.131, liv.152, lv.156,157, book XXXV.i.1; *Pliny 1961*: 98–99, 112–113, 116–117, 260–261. The only time Pliny speaks about some kind of graphic technique for the multiplication of images is when he refers to the 'benevolent invention' of the scholar Marcus Terentius Varro, who produced 'by some means portraits of 700 famous people' (*M. Varro benignissimo invento … septingentorum inlustrium aliquo modo imaginibus*); Pliny, book XXXV.ii.11; *Pliny 1961*: 266–269. There has been discussion about the meaning of this paragraph and whether it

had any relation to engraved illustrations from the eighteenth century; *Rode 1800*. If Varro did indeed publish the images of so many people in edition, then perhaps he used a stencil technique, which was documented later in antiquity. The Byzantine emperor Justin I could not write and he signed decrees using a wooden stencil with the words *LEGI* (I have read it) cut out. The stencil was placed at the bottom of the document, a pen was dipped in special ink, placed in the hand of the emperor and guided along the cut-out lines to draw the letters; *Procopius 1985*: 69–70. A similar story was told about the Ostrogothic king Theodoric the Great using a golden stencil, but this seems a paraphrase after Justin I; *Ensslin 1940*.

35

Ogden & Smith 1990: 5–8.

36

Beckwith 1961, figs 6, 56, 63; *Tenri 2001*: 93.

37

Microscopic examination of silver vessels of the Sasanian period, ie produced in the Middle East from the third to the seventh century, show chased as well as engraved lines in these objects; *Harper & Meyers 1981*: 148–149, 155–156, pl. 19, 20, 23–26. Both chasing and engraving is observed in eighth–ninth-century Irish and Anglo-Saxon jewellery and in a copper plate book cover of a manuscript written at Liège between 1050 and 1075; *Hunnisett 1998*: 6–7, fig. 1. An Islamic astrolabium, dated 927/928 and made by Nastulus (or Bastulus) working in the Middle East, is cast in brass and the additional lines may well be engraved; *Art islamique 1997*: 84–85, 136–137.

38

Blümner 1875–1887, 4: 276; *Daremberg & Saglio 1877–1919*, 1(2): 792 fig. 944; *Lindenschmit 1858–1911*: 1(XII): pl. 5 no. 19; *Rosenberg 1972*: 6: 2–3 fig. 1; *Vernier 1907*: 123, 126 fig. 162; *Hyer & Owen-Crocker 2009*: 271 fig. 13.4.

39

Theophilus, book 3, ch. 10. *Theophilus 1961*: 69–70; *1979*: 91; *1984*: 68, 281; *1999*, 2: 50. There are over forty copies of (parts of) the manuscript left, according to Ilya Dines (Cologne University, Thomas Institute). Reference here is to what is probably the oldest copy: Theophilus, *Schedula diversarum artium*, in the Wolfenbüttel Herzog August Library, Cod. Guelf. 69 Gud. Lat. 2°: fol. 86–114v°. For the latest information on the manuscript and its presumed author see: *Clarke 2011*: 56–57; *Clarke & Stijnman 2012*. A symposium on Theophilus and the *Schedula* was held in Cologne in September 2010, the proceedings of which are forthcoming.

40

The hardening of the tip of the burin is described in some more detail further on in the manuscript, but separately from the hardening of tools in general because it concerns a special case; Theophilus, book 3, ch. 11, 20. *Theophilus 1961*: 70, 73; *1979*: 91, 95; *1984*: 68, 128, 281, 289–290; *1999*, 2: 50, 60.

41

See further Chapter 3, p. 164.

42

The book cover was restored several times preserving its original metalwork.

43

Theophilus 1984: 68, 281, n. 1.

44

Gay 1971, 1: 239 under 'Burin'.

45

Celtes, grab stickel (burin) and *Celus, grab stickel sicut aurifabri vtuntur. Et scribint per dyptongon. Inde celare id est sculpere* (The goldsmith uses the burin and writes letters with it. It (= *celus*) comes from *celare*, this is engraving); *Brack 1485*: fol. XLVr.

46

Theophilus, book 3, ch. 12–13; *Theophilus 1961*: 71(a–b); *1979*: 91–92; *1984*: 69; *1999*, 2: 51–52. The occasional use of hollow punches for making small circles can be seen in German engravings from around the middle of the fifteenth century, some examples: *Geisberg 1923*: 24, pl. 27 (G. 6), pl. 39 (G. 35), pl. 57 (G. 9?). Master of the Power of Women (Lehrs, I. 315,5), Master of the Nürnberg Passion (Lehrs 1973, I. 161, 14), Master of the Death of Maria (Lehrs 1973, I. 166, 18).

47

Scrapers with three-sided blades appear in the late seventeenth century; see Chapter 3, p. 186.

48

Wagner et al. 1979: 223. Scrapers for copper engraving are not depicted or described before the seventeenth century. For discussions on scrapers and polishers see Chapter 3, pp. 170 and 188.

49

Filedt Kok 1985: 28–34.

50

Hollstein German, 7, Albrecht Dürer: nos. 21, 43, 58.

51

Geisberg 1923: 60 pl. 46 top; *Lehrs 1973*, 1: 309–310, 320–321 no. 16.

52

The man is engraving a flat plate with a burin, but the question is whether he is engraving a copper printing plate or a silver plate meant for decoration.

53

Hollstein German, 37, Conrad Saldörffer: 179 no. 16; *Illustrated Bartsch*, 24: 102 no. 20 (122), *Artixan* of the S-series, reverse copy after the *Artixan* in the E-series; *Levenson et al. 1973*: 81–92, *Artixan* in the E-series; *Mummenhoff 1901*: 14 fig. 11 and 18 fig. 15; *Passavant 1860–1864*, 2: 234 no. 164; *Wiebel 1994*: 33–35, *Artixan* in the E-series.

54

Wolters 2006-1: 279, fig. 14.

55

For a discussion on plate supports see Chapter 3, p. 169.

56

See Chapter 3, p. 155.

57

Geisberg 1923: 24, 25.

58

Landau & Parshall 1994: 68.

59

Ibid., 72–73.

60

Roberts 2011: 17. For example, all the maps for Ptolemy's, *Cosmographia*, the work overseen by German Konrad Sweynheym until his death in 1477 and the atlas published in Rome by Arnold Buckink in 1478, are engraved with a burin with a triangular tip that created fine, sharply pointed lines. Neither a burin of round section nor a drypoint is used. Also, the ink of the impressions appears to be a real black, unlike the more greyish ink of prints by Italian engravers of the period.

61

Geisberg 1923, pl. 1 (G. 12), pl. 2 (G. 32), pl. 3, (G. 18).

62

Ibid., respectively pl. 45 (G. 10), pl. 42 (L. I. 219,7), pl. 47 (G. 12).

63

Campagnola's dotting technique fitted so well with the modern Venetian painting of the time that some of his prints were produced in collaboration with Giorgione and Titian; *Landau & Parshall 1994*: 261–264.

64

I am grateful to Jacques Bocquentin for sharing information, and especially for the long and critical discussions on the subject of early intaglio printing; personal correspondence in 1994–1995; *Bocquentin 1993, 1996*.

65

Geisberg 1923: 25, 26; *Lehrs 1973*, 1: 60; *Levenson et al. 1973*: XV. It is also possible to print engravings on leather but there are no early examples documented or at least not recognised as such. See also Chapter 4, p. 264. For the earlier printing of woodblocks on textile see below under 'Printing medium'.

66

For paper formats see Chapter 4, p. 260.

67

Jixing et al. 1993: 11–13; *Tsien 1985*: 38–42.

68

Theophilus begins his explanation of how to prepare leaf gold by taking 'Greek parchment made from flax fibre' (*pergamenam Graecam quae fit ex lana lini*). He is referring to paper that reached him from the Near East through the Byzantine Empire and this is probably the first reference to paper in an occidental source; Theophilus, book 1, ch. 23; *Theophilus 1961*: 20; *1979*: 29–30, n. 2; *1984*: 11, 181–182; *1999*: 68, 140.

69

Bloom 2001: 32, 43, 48, 56–57, 60, 204; *Loveday 2001*: 15, 17–21, 23.

70

Bresc & Heullant-Donat 2007: 373–381.

71

Cf.: *Albro 2009*.

72

Bloom 2001: 207, 212, 216–217; *Bresc & Heullant-Donat 2007*: 379; *Hills 1992*: 37; *Hunter 1978*: 472–473.

73

Bresc & Heullant-Donat 2007: 381; *Tschudin 2002*: 98, 100, 103, 105, 109.

74

Bresc & Heullant-Donat 2007: 380, see also pp. 377–378. For a short introduction on early papermaking in Fabriano see: *Albro 2009*. A monograph by Albro on the subject is forthcoming.

75

Bresc & Heullant-Donat 2007: 357, 382.

76

For example, a contract drawn up in Barcelona in 1497 mentions the supply of 120 reams of paper of medium size at a price of 120 golden ducats, or one ducat per ream; *Madurell Marimón 1955*: 258. In comparison, a ream contained 480 or 500 sheets, and a golden ducat weighed about 3.5 g and was made of almost pure gold.

77

Pawils 2008: 71; *Rosenfeld 1991*: 222, 224; *Tsien 1985*: 309–310. For example, regulations prohibiting the playing of cards were issued in Augsburg in the years 1400, 1406 and 1446 until card games were completely forbidden, although this still was not effective given that Brother Johannes Capistranus was preaching vehemently against it in Augsburg in 1454; *Von Stetten 1779–1788*, 1: 368 and 2: 226–227.

78

Rosenfeld 1991: 222, calculated that for one particular surviving deck of cards dated 1427/1431 at least sixty sheets of paper were needed, while in comparison the Nürnberg chancery bought a ream of paper for its yearly use in 1392. A ream of writing paper is 500 sheets, which makes about eighty decks of 52 cards. In other words, the need for paper for administrative purposes was only modest compared to the amounts needed for the manufacture of playing cards.

79

See further Chapter 4, p. 259.

80

See further Chapter 4, p. 267. With thanks to Shelley Fletcher for discussing early printing inks, especially those of Mantegna; personal correspondence in 2000. Other binding media were also used for relief printing ink.

81

Simonet et al. 1995: 18; *Overbye 2008*: 62; http://en.wikipedia.org/wiki/Çatalhöyük (2010). Çatalhöyük was inhabited from c.7400–6200 or 5700 BC.

82

Bloom 2001: 218–219. *Collier & Tortora 2001*: 430, mention printed cloth found in the northern part of the Caucasus and dating to 1000 BC. *Haller 1938*. *Herrero Carretero 2004*, discusses Islamic stamps on textile of the twelfth–fourteenth century. *Hind 1963-2*, 1: 64. *Massing 2003*, discusses tenth-century Islamic woodcuts stamped on paper, papyrus and parchment. *Meyer-Heisig 1956*: 60. *Ploss 1989*: 115–116. *Ruppel 1961*: 25. *Schaefer 1938-1*, mentions woodblock printing on textile in India in the fourth century BC. *Schaefer 1938-2, 1938-3*. *Tsien 1985*: 136–139, discusses the use of stone, ivory, bronze and wooden seals for stamping from the Shang dynasty (1520–1030 BC) to the printing of texts and imagery from woodblocks; fig. 1102 shows a seal impression on silk dated c. AD 100. *Tsien 1985*: 146–159, discusses the beginning of block printing in China from (possibly) the seventh to the tenth century AD. For information and photographs of Central American roller stamps see: http://en.wikipedia.org/wiki/Cylinder_seal (2010), http://nl.wikipedia.org/wiki/Rolzegel (2010).

83

Forrer 1898, pl. I, II; *Meyer-Heysig 1956*: 60; *Parshall & Schoch 2005*: 21; *Ruppel 1961*: 25; *V.u.K. 1961*: 25.

84

Hind 1963-2, 1: 67–68; *Ploss 1989*: 174; *Ruppel 1961*: 26; *Schaefer 1938-2*: 871; *Schneider 1975*: 53, 56–57.

85

See further Chapter 4, p. 267.

86

See below under 'Rubbing' and 'Casting'.

87

It was known in antiquity that some vegetable oils dried well; *Eastlake 1960*: 15–16, 19–21, 28.

88

Scrivere in oro 2003: 134–135 nos. 109–110.

89

Clarke 2001: 27. For the *Compositiones variae* see *Clarke 2001*: nos. 1310, 2020. For the *Mappae clavicula* see *Clarke 2001*: nos. 2260, 3100 and numerous extracts in others.

90

Schedula diversarium artium, book 1, chapter 20–21; *Theophilus 1961*: 18–20; *1979*: 27–29; *1999*, 1: 66–67.

91

Clarke 2011: 84–87, 138, 140, 279–280.

92

For more detailed information on black pigments see Chapter 4, p. 270.

93

Venice, Biblioteca Marciana, Ms. IT. III-10; *Frezzato & Seccaroni 2010*: 152; **Marciana manuscript** (Gaeta 1570): fol. 157v–158r, recipe (330); *Merrifield 1967*, without the recipe no. (330) on fol. 157r–v: 618–619 recipe no. 329: 636–637 recipes nos. 404, 405; *Seccaroni 2005*. The recipe seems antiquated by comparison with other sixteenth-century recipes for ink and intaglio printing and with common intaglio printing practice of the period during which the manuscript was written.

94

This coincides with an observation by Shelly Fletcher that occasionally loose pigment particles from charred vegetable matter can be seen under magnification in Mantegna engravings; personal communication, 12 February 2005.

95

The tonality of Lucas's engravings is observed from early onwards; *Van Mander 1604*: fol. 212r; *Vasari 1558*, 2: 299, as *Luca d'olanda* on p. 298. Modern scholars made the same observations, but trying to explain the phenomenon they have never mentioned the ink's constituents as causes; *Filedt Kok 1978*: 79; *1983*: 124–126; *Jacobowitz & Stepanek 1983*: 20–21; *New Hollstein Dutch & Flemish*, Lucas van Leyden: 10, 12; *Vogelaar et al. 2011*: 132–136. See also Chapter 3, p. 173.

96

The intense blackness of the ink lines and the near absence of plate tone suggest that the black pigment used for the ink for Dürer's engravings may have been made from charred lees of white wine. Production of such a pigment along the banks of the River Main between Schweinfurt and Würzburg is recorded in later centuries, with Nürnberg being 100 km upstream from Schweinfurt as additional argument for the use of the pigment. See Chapter 4, p. 272.

97

Lehrs 1973, 1: 5. Lehrs states that early impressions of engravings by the Master of the Playing Cards are of a deep black. From the prints of the Master that I observed it seems that early impressions are greyish and can show the doubling of lines typical for printing by rubbing (see Fig. 30), while the later impressions are deep black showing every scratch in the plate as is more typical for printing by press (see Figs 40 and 41); with thanks to Andreas Uhr for discussing the materials. Also according to Lehrs, impressions of engravings by Master E.S. are of a silvery grey and the inks of engravings by other masters are of different hues again. The hues of black also differ within the oeuvre of one engraver, such as the Master of the Amsterdam Printroom; *Filedt Kok 1985*: 29.

98

Cennini 1960: 58–59, 115–118.

99

Bern, Burgerbibliothek, Cod. Hist. Helv. XII 45 (Colmar 1478), in *Oltrogge 2006*: 309–310, 316–318, 320–323, 324; *Cennini 1960*: 115–118; Heidelberg, Universitätsbibliothek, cod. pal. germ. 183: fol. 291, in *Oltrogge 2006*; Heidelberg, Universitätsbibliothek, cod. pal. germ. 211: fol. 39v, in *Oltrogge 2006*; Heidelberg, Universitätsbibliothek, cod. pal. germ. 558: fol. 148v–149v, 151r, in *Oltrogge 2006*; Heidelberg, Universitätsbibliothek, cod. pal. germ. 620: fol. 104r–v, in *Oltrogge 2006*; Jerusalem, The Jewish National and University Library, Edelstein

Collection, Alchemical Ms. Ger. '1472' (last quarter fifteenth, first quarter sixteenth century): fol. 57v–60r, unpublished; Leiden, University Library, Cod. Vossius Chym. Oct. 6 (east of the Meuse, 1496–1498): fol. 144v–145r prescribes printing on paper, in *Oltrogge 2006; Stijnman 1992-1*: 38; London, British Library, Ms. Sloane 345: fol. 24r–24v, in *Braekman 1975*: 167–168 no. 507 and in *Dantzig 1936*: 210, 212 no. O; München, Bayerische Staatsbibliothek, Cgm. 720: fol. 228v, in *Oltrogge 2006*; Nuremberg, Stadtbibliothek, Ms. cent. VI, 89: fol. 12r–18v, in *Oltrogge 2006; Ploss 1989*: 135–140; Trier, Stadtbibliothek, Ms. SB 1028: fol. 20v, 27r–28r, in *Oltrogge 2006*.

100

Schuchardt 1858: 61, 63; *Wiborg 1926*: 192. Future research on the binding media of early intaglio printing inks may clarify this matter. I am much obliged to Jacques Bocquentin with whom I discussed his research into the origins of intaglio printing; *Bocquentin 1996*. See further Chapter 4, p. 311.

101

Pope 1967–1969, 2: 197–205.

102

Van der Linden 1979: 25.

103

Creeny 1891: nos. 6, 9, 10, 26.

104

Ogden 1994: 176–178.

105

Maryon 1959: 161; *Oddy et al. 1982*: 29.

106

Gay 1971, 2: 163; *Ilg 1970*: 84–85; *Oddy et al. 1982*: 29–34; Pliny, book XXXIII.xlvi.131; *Pliny 1961*: 98–99; *Smith & Hawthorne 1974*: 36 nos. 56, 58 and 40 no. 89-B and 58 nos. 196, 197, 206.

107

Theophilus, book 3, ch. 28, 29, 32, 41; *Theophilus 1961*: 80(1)–82(2), 84(1–2), 92(1–2); *1979*: 104–105, 108, 115; *1984*: 79–81, 83–84, 92–93, 301–302, 307, 317; *1999*, 2: 77–79, 84, 114.

108

Secretum philosophorum, English, first half fourteenth century, British Library Ms. Add. 32622: fol. 12r, under the heading 'Grammar'; this concerns a *pseudo-cloisonné* made with a mixture of resin and pigment; *Clarke 2001*: nos. 300, 320, 1350, 1400, 1420, 1435, 2520, 2540; *Clarke 2009*: 62, full text of the copy Glasgow, Hunterian 110: fol. 42r; *Thorndike 1923–1958*, 2: 788, 811–812, lists 16 copies of the *Secretum philosophorum*; *Williams 1935*: 88 n. 63.

109

Liber illuministarum, Bayerische Staatsbibliothek, Ms. Cgm 821: fol. 199r; *Bartl et al. 2005*: 314–315 no. 1032.

110

Pannike 2005: especially p. 555 n. 3.

111

For further discussion on the pressure needed see Chapter 4, p. 287.

112

Tenri 2001: 83.

113

Bungarten & Luckhardt 2008: 178 fig. 148; *Montfaucon 1719–1724*, 3–2: 228–230 pl. 135–138 & suppl. 3: 172–175 pl. 64–65; *Van der Linden 1979*: 24–25.

114

Paulerinus (c.1463) explains that the *ciripagus* cuts copper plates and prints them on paper. He speaks in general terms about this artisan who mastered various kinds of printing techniques, but does not indicate how this was carried out on a practical level; Biblioteka Jagiellońska, Cracow, Ms. BJ 257: fol. 190ra (*Ciripagus*); *Cracow 1980*, Ms. 257; *Hadravová 1997*: 55; *Kemke 1890*: 148. Paulerinus's reference to this *ciripagus* will be discussed by me in greater detail in a forthcoming article on the origin of intaglio printmaking.

115

Frezzato & Seccaroni 2010: 152; **Marciana manuscript** (S.l. 1501–1525): fol. 157v–158r, recipe [330]; *Seccaroni 2005*. See above under 'Black pigments'.

116

Per stampare in sul rame. In luogo di fumo di pece, si toglie zucche lunghe di quelle che si mangiono, et quando sono secche spezale et cavane el seme, et mondale da quella scorza bianca dentro, et quella scorza mettivi foco, et quando è tutta accesa non la lasciare incenerare, ma mettila così accesa in una pignatta, et tura la pignatta di sopra, et così si spegnerà et farà carbone macinalo poi se bisogna: et componi con la vernice ut supra, poi non si stampa in su questo come in su libri, ma se ne pone in sul rame et con le dita si va mandando negli intagli, poi si nettano e pianj, poi si mette la carta in sul rame, et di sopra due o tre doppi di saia, poi sopra la saia un tamburo di carta pecora che tocchi quella saia, poi si liscia forte col lisciatoio et la pittura simprime ut scis. I am grateful to Claudio Seccaroni for drawing my attention to this text and discussing it with me; personal correspondence in 2005 and 2010. Reconstruction with modern materials of the rubbing process produces an impression with continuous lines, much like an impression made by a roller press, provided the ink is relatively thin.

117

See Chapter 4, p. 327.

118

Ameisenova 1951; *Fritz 1966*: 408 fig. 324; *Landau & Parshall 1994*: 373 n. 5. A comparable sixteenth-century Netherlandish piece is a rubbing of a complete cross, including reversed text ('INRI') in the Rothschild collection in Paris; *Blum 1950*: no. 214.

119

Bocquentin 1993: 56–57. Reconstruction shows that tapping is effective, provided that the ink is relatively thin and not too finely ground. The impression shows continuous but grainy lines, which is due to the structure of the brush.

120

For recent discussions see: *Bocquentin 1993*: 57–59; *Gerhardt & Strasser 1987*; *Parshall 1987*; personal correspondence with Claus Gerhardt and Peter Parshall during 1987.

121

Only in recent times has it become possible to use a relief printing press supplying sufficient pressure to print intaglio plates, with hydraulic presses being adapted to the purpose, see Chapter 4, p. 310.

122

Fust sued Gutenberg for not keeping to his contract in 1455, after which Fust's son-in-law Schoeffer started managing the printshop; *Bechtel 1992*: 428–429; *Füssel 2005*: 25; *Jotischky & Hull 2005*: 131; *Ruppel 1961*: 67–68.

123

See Appendix 2, p. 409.

124

See further Chapter 4, p. 286.

125

Hunnisett 1998: 12–13; *Meier 1941-3*: 339.

126

Zonca (Padoua 1607): 53–56.

127

Meier 1941-3: 347–349.

128

Hind 1963-1: 37.

129

Bocquentin 1993, 1: 44–51, 59. After having lost his printshop to Fust and Schoeffer in 1455, Gutenberg returned to Strasbourg where he is documented in the city tax archives in 1458; *Füssel 2005*: 51. In combination with the appearance of the first use of a roller press for intaglio printing in the Upper Rhine area in the early 1460s, it raises the question as to whether Gutenberg might also have been involved in the development of the roller press and, as Bocquentin (p. 59) suggests, whether this may have been in cooperation with Master E.S. who was active in the Strasbourg region.

130

A width of c.30 cm equals the standard size of one foot. For a discussion on the beginning of intaglio printmaking see: *Anzelewski 1991*: 113–117.

131

Bocquentin 1993, 1: 10–15, 59; *Landau & Parshall 1994*: 70–71. That roller presses were not manufactured before 1460 is supported by Paulerinus's reference to the *torcularista*, a craftsman who makes wine and cloth presses; smaller versions are made by the joiner (*mensator*). From his description it becomes clear that these craftsmen only produced standing presses with screws moving platens up and down, and that they were not involved in making roller presses; Biblioteka Jagiellońska, Cracow, Ms. BJ 257: fol. 188bis ra (*torcularista*); *Hadravová 1997*: 38.

132

… quemadmodum tabulis eneis imprimerentur edocuit; *Skelton 1966-1*: VI. See also: *Campbell 1987*: 151; *Hofer 1934*: 214.

133

Skelton 1966-1: V, IX–X.

134

Landau & Parshall 1994: 104, 107, figs 92–94.

135

A width of c.60 cm means twice the standard measure of a foot.

136

The development of the roller press is further discussed in Chapter 4, p. 286.

137

Bocquentin 1993, 1: opp. p. 44; *Meier 1941*: 352–353, 496; *Reti 1974*: 173; *Stromer 1988*: 146.

138

Meier 1941: 496; *Stromer 1988*: 146.

139

Meier 1941: 52; *Reti 1974*: 175.

140

For further discussion see Chapter 4, p. 328.

141

The British Museum curator comments on the illustrated sulphur cast: 'The original plate belonged to the Baptistery of S. Giovanni and is now in the Bargello, Florence. A paper impression was discovered by Zani in the Bibliothèque Royale in Paris, and forms the subject of Denon's plate of Pietro Zani making his discovery. Seratti wrote an article on this sulphur which was published by Zani in his *Materiali per servire alla storia dell'origine e de'progressi dell'incisione in rame e i legno*, Parma: Carmignani, 1802: 215–221. This was translated by W.Y. Ottley in his *Inquiry into the origin and early history of engraving*, London: Arch, 1816: 270–278. A second sulphur cast belonged to Count Durazzo, and is now in the Rothschild collection in the Louvre'. Recipes for casting engravings in sulphur appear only in the modern period, although there is a reference to a decoration in a dagger cast in sulphur by Finiguerra, but these kinds of historical objects are rare; *Levenson et al. 1973*: 1 n. 4.

142

Bertalan 1993: 49–52; *Bowman 1985*: 7–8; *Coombs & Farrel 1986*: 2–3; *Fleischmann 1998*: 27–49, Abb. 19–20; *Geisberg 1923*: 62; *Von Heusinger 1954*: 241–242; personal correspondence with Christian von Heusinger in 2005 and with Jilleen Nadolny in 2006. Pasteprints are currently being researched by Andreas Uhr and his article on the subject is due to be published in the forthcoming exhibition catalogue

accompanying the project 'Rekonstruktion und Erforschung niedersächsischer Klosterbibliotheken des späten Mittelalters' (Wolfenbüttel, Herzog August Library, 2013).

143

Vasari 1568, 2: 294–295; *1878–1885*, 5: 395–396; *1960*: 273–275; *1963*, 3: 68. *Schuchardt 1858*, with a specimen print on paper taken from a cast in sulphur.

144

Levenson et al. 1973: xvii, 1–11. Kristeller discussed the distinctions between the various casts and impressions of *nielli* and *nielli*-like engravings; *Kristeller 1894*: 104–113.

145

It should be considered that engraved silver plates, other than *nielli*, were detached from the objects for which they were made and printed in intaglio occasionally; *Forrer 1904*. Fresh sulphur casts are plastic, but impressions of what seem to have been cracked or broken sulphur casts are known, which would appear to prove Vasari's statement; the cracks give the proofs a reliably ancient appearance. However, counterfeiters would have read Vasari, too, and a number of later impressions are known; *Blum 1950*: nos. 1, 18, 25, 34; *Hind 1936*: 9–11; *Kristeller 1894*: 96–98; *Levenson et al. 1973*: 529–531.

146

Alvin 1857: 8.

147

Geisberg 1923: 5–6; *Hind 1936*: 8; *1963-1*: 43; *Kristeller 1894*: 104–107; *Levenson et al. 1973*: 3.

148

Huth 1923: 34–36.

149

Cennini 1960: 3, 13–15, 87; *Kristeller 1894*: 110–111, 113, 119.

150

See also Chapter 4, p. 331.

151

Filedt Kok 1985: 23–26; *Landau & Parshall 1994*: 73.

152

Filedt Kok 1985: 25, 162, 163, 173–175; *Geisberg 1923*, pl. 29, 30; *Griffiths 1990-3*: 446; *Landau & Parshall 1994*: 5; *Lehrs 1973*, 1: 56.

153

The examples are the *Large, Small and Smallest Virgins of Einsiedeln* engraved by Master E.S. in 1466 for the 500-year commemoration of a local miracle. These pilgrimage souvenirs were sized 20.6 × 12.3 cm, 13.3 × 8.7 cm and 9.7 × 6.5 cm respectively and their sale prices would have accorded with their size; *Landau & Parshall 1994*: 49; *Nash 2008*: 137 figs 92–94.

154

Filedt Kok 1985: 23–24.

155

For more information on the production methods and physical appearance of bound print series see Chapter 4, p. 338.

156

Engravings 1992; *Schuppisser 1991*: 396–397; *Weekes 2004*: figs 88–89, 101–103.

157

Weekes 2004: 81–85, 88–93.

158

Ibid*.,* 89.

159

Stijnman 2009. See further Chapter 4, p. 336.

160

Ibid., nos. 2–4, 17–18, 25–27, 31–32; *Weekes 2004*: 81–82.

161

Prints pasted onto flyleafs or pastedowns of written or printed books are incidental activities of later owners of the volumes.

162

Hind 1963-1: 30, 33, 47, 96, 119; *Hofer 1934*: 212–227.

163

This concerns two paper instruments, a quadrant and a volvelle, in a calendar (Köln: Nikolaus Götz, c.1476), fol. [45]–[46] (g1 and g2 pasted together); *Bradshaw 1889*: 244–245; *Hofer 1934*: 220–222. The copy in the Bayerische Staatsbibliothek, München, is printed in red and black, while the copy in the Cambridge University Library is printed in black only.

164

Filedt Kok 1985: 190–191 no. 91; *Geldner 1978*: 90; *Hellinga 1991*: 52; *Hofer 1934*: 210, 212, ill. p. 207; *Isphording 1987*: no. 11.

165

Antonio Bettini da Siena, *Monte santo di Dio*, Fiorenze: Niccollò di Lorenzo (Nicolaus Laurentii), 1477 (GW 2204).

166

Dante Alighieri, with comments by Cristoforo Landino, *La divina commedia*, Fiorenze: Niccollò di Lorenzo (Nicolaus Laurentii), 1481 (GW 7966).

167

Geldner 1978: 90; *Hind 1963-1*: 47–49; *Hofer 1934*: 211–214; *Isphording 1987*: no. 13.

168

Geldner 1978: 90–91; *Hofer 1934*: 218–221; *Isphording 1987*: no. 17; *Wagner 2009*: 94–95. Some other publications of the 1470s with pasted-in engravings are known; *Geldner 1978*: 90; *Hind 1963-1*: 47–49; *Hofer 1934*: 208–212, figs on pp. 204, 207; *Isphording 1987*: no. 13.

169

Hofer 1934: 214–217; *Skelton 1966-1*: VI.

170

Geographia di Francesco Berlinghieri fiorentino in terza rima et lingua toscana distincta con le sue tavole in varii siti et provincie secondo la geographia et distinctione dele tavole di Ptolemeo, Fiorenze: Niccollò di Lorenzo (Nicolaus Laurentii), before September 1482 (GW 3870). *Geldner 1978*: 91; *Skelton 1966-2*; *Stijnman 2009*: no. 21.

171

Geldner 1978: 91; *Hofer 1934*: 222, 225; *Stijnman 2009*: no. 20; *Wagner 2009*: 96–97.

172

Dye zaigung des hochlobwirdigen hailigthums der Stifftkirchen aller hailigen zu wittenburg, Wittenbergk: Reinhart, 1509. This edition has a coat of arms on the title page, the second edition of 1510 has a double portrait engraved by Lucas Cranach the Elder on the title page with on the left Friedrich der Weise and on the right Johann der Beständige, dukes of Saxony; *Hofer 1934*: 298–299; *Stijnman 2009*: no. 22. See further Chapter 4, p. 336.

173

Schneider 1975: 56–57, 190.

174

Augsburger Buchdruck 1997: 117; *Parshall & Schoch 2005*: 92–94 no. 13, concerns a woodcut printed in white ink on green coated paper; *Schreiber 1928*: 87; *Stijnman 2009-1*: nos. 9-15.

175

See further Chapter 4, p. 341.

176

Landau & Parshall 1994: 21, 78–79; *Lehrs 1973*, 1: 55.

177

Geisberg 1923: 24, for Abraham Bosse the yellowing of ink in engravings by Martin Schongauer and his contemporaries indicated the use of oil that was not boiled or burnt; *Bosse 1649*: 74–75.

178

Hofmann 1867: 94; *Landau & Parshall 1994*: 76; *Lehrs 1973*, 1: 55–56 and 2: 130–131 no. 70; *Shestack 1977*; personal correspondence with Nicholas Stogdon in 1995. See also Chapter 4, p. 276.

179

Höfler 2007, 1: 91 and 2: 13, fig. 70.

180

Landau & Parshall 1994: 21. The following is a list of documented colour prints of the fifteenth and early sixteenth century. *Niello* proofs printed in blue; *Blum 1950*: nos. 60, 69, 92, 111, 120, 160. Domenico Campagnola, impressions in red ink, c.1517; *Hind 1938–1948*, 5: 212 no. 9 and 213 no. 12[II]. Design for a silver dish or deckel, Florentine, c.1475, engraving, printed in blue; *Grimm et al. 2011*: 86–87; *Karr Schmidt 2008*; *Stijnman 2009-1*: 34 no. 19. Two paper instruments, engravings, the first printed in red, the second a volvelle with the base plate printed in red and the two disks in black; L. Beham (Calendar), Köln: Götz, c.1476, fol. 45–46, in the Bayerische Staatsbibliothek, München, Rar. 314. *St. Anthony*, Albrecht Dürer, impression in red ink, 1519, of (B. 58, H. 51), which only Meder seems to have seen; *Levenson et al. 1973*: 422, 426; *Meder 1932*: 56, 89; *Straus 1981*: no. 89; not in *Hollstein German*, 7, Albrecht Dürer: no. 51. Andrea Mantegna or his school, Giovanni Antonio da Brescia, various impressions in blue, brown and green ink, 1460–1480 (see Fig. 218, p. 276), Nicoletta da Modena, impressions in blue ink, c.1507, Marcantonio Raimondi, impression in green (?) ink, Mantegna's *Flagellation* in the Berlin Kupferstichkabinett and Giovanni Antonio da Brescia's *Virgin and Child* (London, British Museum); *Landau & Parshall 1994*: 78–79. Marcantonio Raimondi, engraving in red ink in the printroom in Budapest; Mayer 1987: 202. Perhaps the first Italian book illustrated with engravings printed in colour is Ambrogio Leone Nolanus, *De Nola opusculum distinctum, plenum, clarum, doctum, pulcrum, verum, grave, varium et utile*, Venetia: Vercellani, 1514, which contains four engravings by Girolamo Moceto, half of which are printed in black and the other half in blue (or blue turned green) or red ink respectively, depending on the copy; *Levenson et al. 1973*: 426 n. 2; *Stijnman 2009-1*: 38 no. 23. Copyist after Martin Schongauer, *A Male Saint, Bishop (St. Augustine?)*, early sixteenth century (?), unrecorded impression in red ink, Printroom of Leiden University. Domenico Campagnola, *Twelve Children Dancing*, 1517, impression in reddish brown; Art Institute of Chicago.

181

For example: Lucas van Leyden, *Christ, Paul and the Twelve Apostles*; *New Hollstein Dutch & Flemish*, Lucas van Leyden: nos. 86–99, late sixteenth-century impressions in red, probably by the Antwerp plate printer Martinus Petri; information kindly supplied by Joris van Grieken.

182

For the hand-colouring of engravings see Chapter 4, p. 372.

183

Hind 1963-1: 35–36; *Landau & Parshall 1994*: 78, 180. Perhaps also Mantegna used a prepared paper to print the copy of the *Bacchanal with Wine Vat* in Caen; *Landau & Parshall 1994*: 384 n. 110 (n. to p. 78).

184

Smith 1981: 277–281.

185

Francis 1980: 24.

186

Beck 1933; information kindly supplied by Dolores Snel.

187

Chase & Franklin 1979: 243–256; *Loehr 1956*: 204–205.

188

Ogden 2003: 160.

189

Pope 1967–1969, 1: 212–221, 232–237, 304–309, 2: 141, 146–147, figs 182, 183, 187; with thanks to the staff of the Freer Gallery of Art for additional information.

190

Gladwin et al. 1965: 148–151; *Haury 1967*: 677, 680; *Pomeroy 1959*. I made a reconstruction that involved etching a sea shell with strong (8%) vinegar that produced a relief of 0.2 mm in twelve hours.

191

Böhne 1963: 227; *Meijer 1981*: 34; *Smith 1965*: 8–9.

192

Buchwald defines steel as 'a binary alloy of iron and carbon, with carbon in the range from 0.3 to 1.7%'; *Buchwald 2008*: 445.

193

Aitchison 1961, 1: 225–226, 253–257; *Anteins 1966*; *France-Lanord 1964*: 321, 326–327; *Glosek & Kajzer 1977*; *Kirpicnikov 1986*: 15; *Neuman 1927*; *Panseri 1965*; *Sachse 1993:* 116–117; *Tylecote 1992*: 66, 68.

194

Buchwald 2008: 456–458. Pattern welding should not be confused with the production of Wootz steel, practised in India and the Middle East, and called 'damascening' after the city of Damascus through which damascened swords were traded; *Buchwald 2008*: 475–477; *Sachse 1993*: 36, 94, 162–163, 165; *Verhoeven et al. 1998*.

195

Diodorus Siculus, Book V, XXXIII, 3–4; *France-Lanord 1964*: 321; *Oldfather 1970–1989*, 3: 184–187.

196

Böhne 1963: 230–233; *Jones 1997*: 1–3; *Sachse 1993*: 28–29; *Smith 1965*: 4.

197

Media pulchris alveis excavata quibusdam videntur crispari posse vermiculis; Cassiodorus, *Variarum*, V.1. *Salin 1957*: 273–274 no. 247; *Smith 1965*: 6–7.

198

Allan 1979: 86; *Verhoeven et al. 1998*: (4).

199

My thanks to metal conservator Allan Williams for elucidating this matter.

200

France-Lanord 1964: 323–324, pl. II–VI; *Wyss 1968*: 664–672, figs 3–5.

201

Smith & Hawthorne 1974: 49 n. 98.

202

Oakeshott shows a tenth-century sword blade with what may be an example of this technique of copper plating; *Oakeshott 1981*: pl. 48.

203

Calcitarim et alumen Asianum equis ponderibus et sal similiter; Biblioteca Capitolare di Lucca, Ms. 490: fol. 221v; *Scrivere in oro 2003*: 102–103 no. 65 and 176.

204

The same recipe can be found in later manuscripts, such as in the ninth-century *Mappae clavicula* and in the Codex Matritensis (c.1130). For the *Mappae clavicula* see: *Smith & Hawthorne 1974*: no. 245. The Codex Matritensis is in the Biblioteca Nacional, Madrid, Ms. A.16. The recipe for copper plating is no. (81): fol. 203r col. a.

205

Ilg 1970: 64–67 no. XVII; *Merrifield 1849*: 222–225. First copper plating the metal is needed in this so-called 'fire gilding', because the amalgam cannot be applied directly onto the iron; *Bartl et al. 2005*: 314 n. to no. 1032: 669–670.

206

Guineau 2005: 88–89 ('atramentum'): 179–180 ('calcanthe-calcater'): 237–238 ('colcothar'): 773–775 ('vitriol'); *Perego 2005*: 529 ('Colcotar'); *Smith & Hawthorne 1974:* 28–29, n. 13; *Stijnman 2006*, Appendix 3: 'Terms for "vitriol"'.

207

A solution of copper(II) sulphate in water shows immediate copper plating when iron is dipped into the liquid. Prolonged exposure of the iron to the solution shows only a minor corrosion after a few days. The addition of kitchen salt propels the chemical reaction and etches the iron in a few minutes. I am grateful to Jana Sanyová for elucidating the chemical processes behind it.

208

The following fifteenth-century manuscripts contain recipes for the etching of letters or decoration in iron daggers or swords by means of solutions of various salts in vinegar. Disclaimer: the following references are documented in literature, but I have not consulted the manuscripts themselves therefore institutions and foliations cannot be guaranteed. Bad Berleburg, Fürstlich Sayn-Wittgensteinsche Schloßbibliothek, Ms. F4: fol. 62r, 219va, 253vb. Bologna, Bibliotheca Municipale (?), Luca Pacioli: fol. (?). Cracow, Biblioteka Jagiellońska, Ms. BJ 257: fol. 188va. Fermo, Biblioteca Comunale, Ms. 99: fol. 48v–49r nos. 113 bis, 114. Harburg, Stadtbibliothek (?), Ms. Cod. III 2.º 34: fol. 12v–13v. London, British Library, Ms. Sloane 122: fol. 93r; Ms. Sloane 416: fol. 27r, 42r–v, 51r, 67v, 68r, 135r–v; Ms. Sloane 962: fol. 171r. München, Bayerische Staatsbibliothek, Ms. Cgm 821 (*Liber illuministarum*, Tegernsee Ms.): fol. 34r no. 86: fol. 34r–v no. 87: fol. 45r no. 145, fol. 98v no. 225, fol. 138r no. 407, fol. 139r no. 415, fol. 140r no. 424, fol. 194r no. 996, fol. 199r no. 1032, fol. 199 no. 1033. Oxford, Bodleian Library, Ms. Ashmole 1397: fol. 119r; Ms. Ashmole 1491: 1305; Ms. Ashmole 1494: 490; Ms. Canon. Misc. 128: fol. 38r–57r(?). Paris, Bibliothèque Nationale, Ms. Graecus 2327: no. 18; Ms. Latin 6741 (? Jehan Le Begue), Alcherius: nos. 63, 64; Ms. Latin 7105: fol. 145r.

209

The technique of etching iron printing plates with a solution of copper sulphate and kitchen salt was revived in the 1990s, see Chapter 3, p. 223.

210

Nitric acid is HNO_3. The *Liber de inventione veritatis* is part of the *Summa perfectionis*, Bayerische Staatsbibliothek, München, Ms. Lab. 353. The *Liber de inventione veritatis* is traditionally ascribed to 'Geber', but a better candidate may be the Franciscan lector Paulus de Tarento working in Assisi in the late thirteenth century who originally came from the south of Italy; *Beltran 1998*: 505; *Forbes 1970*: 63, 86; *Geber 1922*: 8, 113–114, 179; *1928*: 223–224; *Karpenko & Norris 2002*: 1002; *Von Lippmann 1971*: 175; *Walden 1952*: 6–7.

211

Saltpetre is KNO_3, the kind of alum meant here is $K_2SO_4.Al_2(SO_4)_3$. *Stijnman 2006*, Appendix 3: 'Terms for "vitriol"'. Further addition of a quarter of a pound of sal ammoniac (NH_4Cl) creates *aqua regia*, a mixture of nitric acid and hydrochloric acid (ratio 1:3), by distillation, which is the only mordant capable of dissolving gold.

212

Newman 1985: 77, 79, 81, 88, 90; *Singer 1948*: 49–50.

213

al-Hassan & Hill 1986: 147–149; *Singer et al. 1954–1984*, 2: 356; *Stevenhagen 1974*: 42–43.

214

Hanegraaff 2005, 1: 22, 27–28, 30–32, 35.

215

The average proportions by weight for black gunpowder are 75% saltpetre, 10% sulphur and 15% softwood charcoal charred at 400°C.

216

Forbes 1970: 87. It is therefore understandable why Leonardo da Vinci may have intended to use nitric acid for etching copper (relief) printing plates around 1500, see below: 'Etching iron printing plates'.

217

Agricola 1950: 441–442; *Forbes 1970*: 87.

218

Vasari merely mentions the use of nitric acid and an alternative mordant; *Vasari 1568*, 2: 304. For the first explicit references to etching copper printing plates with nitric acid see: **Brugghen** (Amsterdam 1616): fol. D3r; **Etching ground** (Netherlands 1601–1625); **Zonca** (Padoua 1607): 78. From the 1630s onwards nitric acid is found more often in etching recipes until it became the standard mordant for biting printing plates. See further Chapter 3, p. 199. I am grateful to Basil Hunnisett and especially to Mark Stevenson for discussions on the early history of acids.

219

For example, the first Italian etching manual is: **Gariazzo** (Torino 1907). Bosse's famous manual on intaglio printmaking was not translated into Italian until 1937; **Bosse** (Bologna 1937).

220

British Library Ms. Add. 32622: fol. 12r, under the heading 'Grammar'; *Clarke 2001*: nos. 300, 320, 1350, 1400, 1420, 1435, 2520, 2540; *Thorndike 1923–1958*, 2: 788, 811–812, lists 16 copies of the *Secretum philosophorum*; *Williams 1935*: 88 n. 63. *Pannike 2005*: 555 n. 3.

221

Furno 1531: fol. aij–r; *Von Lippmann 1971*: 175.

222

Compare this with the Geber recipe above.

223

Furno 1531: 13, *addenda*; *Forbes 1970*: 63–64, 86; *Von Lippmann 1971*: 179.

224

The tray is not mentioned in the recipe, but follows from the action described.

225

Furno 1531: 226; *Von Lippmann 1971*: 181.

226

Eastlake 1960, 1: 93: *torai dela cira e farage dintorno le sponde aquelo designamento*.

227

For vitriol and saltpetre see above, p. 48. 'Sublimate' is mercury chloride ($HgCl_2$) and 'verdigris' is copper acetate $Cu(CH_2CH_2OOH)_2$. British Library, London, Ms Sloane 416, 1424–1456: fol. 135v. *Eastlake 1960*, 1: 93; *Harzen 1859*: 124–125 n. 16-17. Bibliothèque National, Paris, Ms. Graecus 2327, 1478, recipe no. 18; *Wolters 2006-1*: 269–270, recipe no. 18; *2006-2*: recipe no. 18.

228

Harburg, Ms. Cod. III 2.º 34, 1489–1516: fol. 12v–13r, 13v; London, British Library, Ms. Sloane 962, 1400–1425: fol. 171r; München, Bayerische Staatsbibliothek, Ms. Cgm 821, fifteenth century: fol. 34r no. 86, fol. 138r no. 407, fol. 139r no. 415, fol. 140r no. 424; München, Bayerische Staatsbibliothek, Clm 20174, fifteenth century: fol. 186r; Oxford, Bodleian Library, Ms. Ashmole 1397, 1400–1425: fol. 119r. The technique of making an acrid paste using charcoal powder dates back to at least the fourteenth century, given the dating of Ashmole 1397. It is also found in Glasgow, Ms. Hunterian 110, late fourteenth century: fol. 42r, *Cum sculpere litteras in cultello ex calibe volueris,* which explains how to make a paste of willow charcoal powder, kitchen salt and sharp vinegar that is to be left on the steel knife for one month, the paste being kept damp with vinegar; *Clarke 2009*: 62. Perhaps the oldest is by Vitalis de Furno, and then dating from the early fourteenth century; *Furno 1531*: 225–226. The latest found is in: *Baten 1609*: 164.

229

No source available, but reconstruction showed that it worked.

230

Printing ink recipe (1500–1525): fol. 22r. *Vandamme 1974*: 122, reproduces the page of the manuscript, including a small sketch with the set-up next to the recipe. Similar techniques involving pouring acid onto the etching plate were documented in the seventeenth and eighteenth centuries; see Chapter 3, p. 204.

231

A project was carried out that involved etching copper with a vinegar and kitchen salt solution by me and four participants of the SSNW discussion list in the autumn of 2006. It proved that – under various conditions, with the participants living in Australia, the Netherlands,

the United States and Canada, using locally acquired materials – copper can be etched deep enough by means of a mixture of kitchen salt, weak and strong vinegar to create a printing plate in 4–6 weeks depending on the strength of the vinegar. I would like to thank Linden Langdon, Tina More, Charles Morgan and Terry Peart cordially for their cooperation. The stronger the vinegar the faster it works, provided it is mixed with kitchen salt, which propels the reaction. The solution turns blue after two weeks. This could mean that the chemistry behind the reaction might be that first a copper hydroxide ($Cu(OH)_2$) is formed, which is the actual etchant. I carried out a further test etching copper with vinegar only, using vinegars of two different strengths with the result that 8% vinegar etched a tangible line in copper in one year (the liquid also turned blue), while 4% vinegar merely matted the copper in the same timeframe.

232

Bruhn Hoffmeyer 1963: 15–16 fig. 4; *Norman 1964*: 105 fig. 108; *Oakeshott 1981*: 141–142 pl. 15, 16, 30C, 31.

233

Following Harzen's argument that steel could not be engraved but only etched, an earlier case could be made for the sword of Roger II (1095–1154), first king of Sicily, who had a text engraved (etched?) in the blade of his sword in 1150; *Harzen 1859*: 125 n. 19. Roger had created a society that welcomed both Christian and Islamic scholars, in which manner Islamic science on acids and etching possibly became available in Sicily.

234

Quas eciam cavat cum sale armoniaco et scribit textus et ymagines in eis et ubi fuerit mineum scriptum cum oleo lini, illis non ledetur ferrum aliqua corrosione; Biblioteka Jagiellońska, Cracow, Ms. BJ 257: fol. 188va (*Sagittinus*); *Hadravová 1997*: 32. The *mineum* (minium) is red lead (Pb_3O_4), which also acts as a drier on the linseed oil, thereby turning the oil paint into an acid-resistant coating in about seven days.

235

Alexander 1987: 24, 25; **Braun** (Augsburg 1973): 22–23; *Gamber et al. 1976–1990*, 1: 74–75 no. A49; *Mann 1942*: 19–20, but see *Gamber et al. 1976–1990*, 1: 85 fig. 29; *Oakeshott 1981*, pl. 42B; *Norman 1964*: 105–107; *Post 1958*; *Tarassuk & Blair 1982*: 160–161.

236

Gamber et al. 1999; *Kren 2005*: 3; *Mann 1942*; *Norman 1964*: 59–82; *Plattnerkunst 1954*: 41–43, 60–61, 66–67; *Scalini 1997*; *Von Reitzenstein 1964*, ill. 14, 15, 43–45.

237

Bernt 1939: 20–21, 192–195; *Canz 1976*: 13; *Freudenberg & Mondfeld 1982*: 141; *Haedeke 1963*: 16, 22–23, 179–180, 347–348, 422–424; *Impey & MacGregor 1985*, figs 30, 31; *Iven 1938*: 186–187; *Pechstein 1985*: 230, 250, 255, 265, 281, 481; *Schopers 1981*: 33, 35; *Syndram & Scherner 2004*: 159–175; *Wegner 1958-1*: 178–179, 184; *Weixlgärtner 1911*: 339–345.

238

It is, for example, common to find etching recipes in sixteenth-century housebooks, collections of all kinds of recipes useful in a household, such as medical, cosmetic and cookery recipes. Typical is the housebook (Heidelberg before 1572) of Peter Herman, which has a recipe for etching iron and steel sandwiched between recipes for curing horses and medical recipes for humans; University Library, Heidelberg, Cod. Pal. germ. 186: fol. 130r (*In eissenn oder Stahel zu etzen*).

239

A related mediaeval technique involves painting lines with a mixture of honey and a colorant, a mixture that stays moist, on leaf metal; the rest of the area is painted with a normal paint that dries and the whole is covered with varnish. When the varnish is dry, the lines drawn with the honey mixture are scratched away to reveal a shiny metallic drawing; Montpellier, Bibliothèque de la Faculté de Médicin, Ms. H 277, § 2.13.1A (*De colore qui non siccatur. capitulum .xiij.*), Veneto region before 1431, the manuscript is copied after a fourteenth-century compilation of recipes; *Clarke 2001*: 91 no. 2090; *2011*: 142 (English translation), 214 (commentary), § 2.13.1A (transcription). For writing or drawing in white against a black background: draw or write with a mixture of egg yellow in water on paper, cover the whole with black writing ink, let dry and scrape off the mixture; *Boltz von Ruffach 1988*: 117, transcription after the original edition of 1549. Actual lift-ground was practised from the later eighteenth century, see Chapter 3, p. 217.

240

Biblioteca Nacional, Madrid, Leonardo da Vinci, Codex Madrid I & II, 2: fol. 119r; *Reti 1971*: 193; *1973*: 28; *1974*: 272. Note that Cassiodorus, in the letter to Thrasamond, also spoke of 'hollowed out' (*excavata*) grooves; see above, p. 47.

241

Partington 1961–1970, 2: 6; *Reti 1971*: 19.

242

Relief etching the other way around by drawing with a liquid resist directly onto the plate and biting the metal was not practised until the end of the eighteenth century, by English engraver William Blake. This became a standard technique for producing printing plates for book illustration from 1834 on; *Nadeau 1989–1990*: 97, 413; *Netto 1840*; *Phillips 1991*: 207–208.

243

Metzger et al. 2009: 20–21, 23. Hopfer's contemporary Hans Burgkmair produced only one etching, the *Venus, Mercury, and Cupid* in about 1518–1520; *Hollstein German*, 5, Hans Burgkmair: no. 834. Analysis of the printing plate, which is kept in the British Museum, showed that it was made of layers of soft and carburised iron forged together, as in pattern welding. Burgkmair may have used a kind of plate iron that was common to armourers; London, British Museum, inv. 1862, 1011.184; *Landau & Parshall 1994*: 331; *Williams 1974*.

244

Fritz 1966: 389–390; *Harzen 1859*; *Köhler 1897*; *Landau & Parshall 1994*: 323–327; *Loßnitzer 1910*: 36; *Metzger et al. 2009*: 18–24; *Williams 1934*.

245

Hollstein German, 15, Daniel Hopfer: no. 70; *Metzger et al. 2009*: 27–34; *Weixlgärtner 1911*: 379.

246

With thanks to Peter Parshall for discussing the issue; personal correspondence in 1991. Copper corrosion is possible when the plate is exposed to salts for a longer period and occasionally late impressions of fifteenth-century copper plates show mild forms of corrosion. See Chapter 3, p. 134.

247

Hirschvogel's six copper plates of his circular map of Vienna (Holl. 19) of c.1550 are kept in the Historisches Museum der Stadt Wien, inv. nos. IN 503/1-6, each plate measuring 43 × 28 cm; *Schwarz 1917*: 44–45, 121 n. 162; *Thieme-Becker 1901–1950*, 17, 'Hirschvogel, Augustin': 139. After Hirschvogel's death his 'copper' plates were wrapped in paper; *Schwarz 1917*: 141 no. XLIII (1553), see also 142 no. XLVIII (1555). Hirschvogel also practised etching iron armour; *Schwarz 1917*:136 no. XXV (1546).

248

Metzger et al. 2009: 19–20.

249

See Chapter 3, p. 209.

250

Von Heusinger 2000: 33, 66. For the other undated and unsigned etching by Gossaert see: *Orenstein 2010*: 412–414; *Orenstein 2011*.

251

Landau & Parshall 1994: 330–331. Only one impression is known in Basel. The copy in the Kunsthalle Bremen turned out to be a reproduction; *Röver-Kann 2008*: 12 n. 16.

252

Hunnisett 1987, 15: 376.

253

Hunnisett 1980: 1; *Landau & Parshall 1994*: 327–332; *Schmitt 1957*, both cat. nos. 45 and 46 with dates '1544' show rust stains; *Wegner 1958-2*: 1152. See further Chapter 3, p. 134.

254

His early apprenticeship was with goldsmith and engraver Francesco Francia, which would have given him the opportunity to see or learn the action of nitric acid for parting gold and silver; *Reed & Wallace 1989*: 3.

255

Landau & Parshall 1994: 265, 327–328; *Partington 1961–1970*, 2: 37–38; *Reed & Wallace 1989*: 4–5.

256

New Hollstein Dutch & Flemish, Lucas van Leyden: 16 nos. 12, 29, 125, 150, 159, 172.

257

Landau & Parshall 1994: 332–333; *Stijnman 1988*.

258

See above under 'Shape of the burin'.

259

Nicolaas Hogenberg was the first to make a serious production with the 40 plates of his entry of Emperor Charles V and Pope Clement VII in Bologna in 1530. So much copper and an equivalent amount of nitric acid begs a sponsor.

260

Cellini (Fiorenza 1568): fol. 43v–44r; *Vasari 1568*, 2: 304.

261

Earliest sources: **Brugghen** (Amsterdam 1616): fol. D3r; **Etching ground** (Netherlands 1601–1625).

262

For the dissemination of etching recipes from Italy across the Alps see Chapter 3, p. 201.

263

Van Mander 1604: fol. 214r l. 33–34; *Vogelaar et al. 2011*: 122–123. Discussion is about where, when and above all from whom Lucas learned the basics of engraving, etching, the construction of the roller press, ink making and intaglio printing, because intaglio printmaking was hardly practised in the northern and southern Netherlands then, let alone in a town such as Leiden. Van Mander writes that Lucas learned etching from an armourer and (perhaps) a goldsmith: *Het Plaet-snijden soude hy geleert hebben van eenen die Harnassen hetste, en met sterck water beet, met oock eenigh onderwijs* [in etching?] *van een Goutsmit*. His remark could be read as that the iron armour was bitten by a solution of salts in vinegar, which does not affect copper, but the consulted armourer would have had knowledge of resists, preparing the metal, drawing into the resist and the process of etching. The goldsmith used parting water, nitric acid being suitable for etching copper. Etching copper with nitric acid was known in the northern Netherlands in Van Mander's time a century later; **Brugghen** (Amsterdam 1616): fol. D3v. Interpreted in this way we either read a general remark by Van Mander, based on his own experiences from the end of the sixteenth century and not on historical facts, or Van Mander was indeed informed in more detail about Lucas's training.

264

The following engravers were active in the Netherlands before 1500: the Master of the Boccaccio Illustrations (Brugge?), Monogrammist F.V.B. (Brugge?), Monogrammist G.M. (Mechelen), Monogrammist H.O.S. (with dagger; northern Netherlands), Monogrammist I.A.M. (Zwolle), Monogrammist M. (possibly somewhere in the Netherlands), Allart du Hameel ('s-Hertogenbosch). Jacopo de' Barbari came to Souborch and Mechelen after 1510 when Lucas had already begun engraving and printing his plates. It is only after 1520 that we find a few other engravers in the northern Netherlands, starting with Jan Gossaert and Allaert Claesz.

265

Rupprich 1956–1969, 1: 174; *Vogelaar et al. 2011*: 198. Gossaert probably was in Utrecht at the time; Dürer did not meet him in Antwerp. A *Lucas de Hollandere*, in older literature generally seen as Lucas van Leyden, was received as *vrymeester* by the officials of the Guild of St. Luke for the year 1522; *Rombouts & Lerius 1872*, 1: 99; *Vogelaar et al. 2011*: 199 n. 22.

266

Von Heusinger 2000: 9, 39, 70–72. Von Heusinger's suggestion is supported by the fact that just one copy of Gossaert's etching of Charles V is known. Its provenance goes back to the ducal family of Braunschweig-Wolfenbüttel, which had ties with the Habsburg family and owned more objects with imperial provenance. Lucas's etching of Maximilian I is known in some twenty copies, all of which are early impressions. Gossaert was in the service of Philips of Burgundy and Lucas lived in Leyden, only 60 km or a day trip down the Rhine from Utrecht. Philips was an avid collector of the modern art of his day and would have been acquainted with Lucas, but no works of his are known to have been in Philips's collection.

267

Landau & Parshall 1994: 332–334; *Popham 1925*: 354, 356. Jan Piet Filedt Kok, specialist in prints by Lucas, does not see that his works were an example for Vellert's prints.
268

Van der Stock tentatively suggests that Gossaert was answered by Cranevelt concerning Gossaert's question about etching copper, referring to a note by Cranevelt. The note certainly describes Cranevelt's interest in technical matters, but as already made clear by Henry de Vocht and by comparison with similar contemporaneous texts, this is a recipe for preparing a red dyestuff from brazilwood and has no connection with his etching experiments; *Van der Stock 1998*: 327; *Vocht 1928*: 24 n.; *Ploss 1989*: 106, 142.
269

Van der Stock 1998: 326 n. 7.
270

Narravi Malbodio pictori de [aqua quae] laminas ereas exedit: mirabatur supramodem, dicebatque se id frustra sua aqua tent[asse]; quare petit ut aquae tuae mixtionem et reliqua artis tuae occulta quamprimum nobis scr[ibas], mittasque hujusmodi literas Middelburgum ad Dominum Abbatum aut ad Cordatum nostrum; Leuven, Katholieke Universiteit, Centrale Bibliotheek, Universiteitsarchief, Craneveltbrieven, Lit. Cran. 10; *Sterk 1980*: 138; *Van der Stock 1998*: 326–327; *Vocht 1928*: 24. 'I have told Mabuse [= Jan Gossaert] the painter about the water that eats copper plates: he wondered about this, and said that he himself had tried this in vain with his water; therefore he asks whether you can write to us as soon as possible the mixture of your water and the other secrets of your art; and you can send a letter about this to Middelburg to the Lord Abbot, or to our Cordatus'; (my translation).
271

Hollstein Dutch & Flemish, 5 (Frans Crabbe): nos. 1, 26 & 32 show 'bubbles', nos. 44 and 46 are dated August 1522; *Nagler 1858–1879*, 2, Frans Crabbe: 727 no. 1983; *Von Heusinger 2000*: 72.
272

The Evangelist St. Mark; *Hollstein Dutch & Flemish*, 5, Frans Crabbe: no. 41; *Hollstein Dutch & Flemish*, 9, Nicolaas Hogenberg: no. 19; *Popham 1935*: 98 and 203 pl. XVII.
273

Hollstein Dutch & Flemish, 9, Nicolaas Hogenberg: nos. 4, 5, 6, 26.
274

Hogenberg's son Frans Hogenberg also used a needle with a chisel-shaped tip to draw thicker outlines. See for example various plates in: *Kurtzer bericht, deßjenigen was sich ihm Niderlandt in Religionssachen, Und sunst von Anno. M.D.LXVJ bis auff diß Gegenwertigen siebentzigsten Jars zugetragen hat (etc.)*, [Köln?: Hogenberg?, c.1575].
275

Von Heusinger 2001: 73–100.
276

Landau & Parshall 1994: 327–328.
277

Reed & Wallace 1989: 6–10.
278

Yeder Landt, ja Yeder Meester van een en zelfde Stadt, heeft zijn byzondere maanieren; **Bosse** (Amsterdam 1662): 123.
279

The Upper Rhine region is of particular interest for the history of printing and printmaking. The process of intaglio printing was conceived by someone in the Basel-Strasbourg area in the 1430s. About a quarter of a century later the first use of a roller press can be recorded here, possibly in the studio of Master E.S. in Strasbourg in 1460–1465. The first engraver for whom we have biographical information is Martin Schongauer from Colmar. It should also be remembered that the inventor of typographic printing, Johann Gutenberg, began his activities in Strasbourg in the late 1430s before running the first printshop in Mainz in the 1440s and 50s.
280

In Nigeria, for example, Ru van Rossem taught etching classes in 1965; *Duister 1976*: 32–34. Intaglio printmaking is practised in Kenya and South Africa nowadays.
281

See Appendix 2, p. 409. See also: *Parshall 2007*; *Schmidt 1992*. I am preparing a separate publication with a more detailed discussion on the origin of intaglio printmaking. The main purport of this discussion will be that, following Martha Wolff and others, the origin of intaglio printmaking should be sought in workshops of miniature painters and that only some goldsmiths started producing copper engravings in the latter half of the fifteenth century.
282

See above under 'The roller press'.
283

Roberts 2011: 16–17.
284

Skelton 1966-1: VI.
285

Jacobs 1925: 249; *Roberts 2011*: 5, 17. Note also that the printer and publisher of this *Geographia*, Nicolaus Laurentii, was a native of Wrocław (Breslau).
286

Alegre Nuñez 1968, 1: no. 611; *Carderera 1864*; *Lafuente Ferrari 1989*: 13, 22; *Páez Ríos 1981–1985*, 1: 290 no. 611; *Hind 1963-1*: 70, 101–104, 116. Perhaps the first engravers in France and Spain came from Germany or had some connections with German engravers. For German book printers working in Barcelona c.1500 see: *Madurell Marimón 1955*: 187–192, 212–216, 258–261, 469.
287

Hind 1963-1: 129, 134–136; *Tietze-Conrat 1925*.
288

Hind 1963-1: 391–392; *Janssen 2010*; *Lavonen 2001*; *Tucker 2002*.

289

Thieme-Becker, 9, 'Detterson, Johann': 164–165.

290

The first Russian engravings appeared at about the same time; *Leerink 1946*: 18–20; *Thieme-Becker*, 34, 'Ušakov, Simon': 5–6.

291

Leerink 1946: 20, figs 3, 3a.

292

Janssen et al. 2010.

293

Bloom 2001: 223. Seals engraved in intaglio are found in the Arab and Persian world from the thirteenth century. These were stamped in relief, however, such as on letters; *Déroche 2000*: 355–363.

294

The project was cancelled by Turkey, after which Young published the series on his own account; *Burch 1983*: 91.

295

Bøegh ([…] 2012).

296

Hauksdottir 1995: 16.

297

Laures 1957: 7–14.

298

Chibbett 1977: 64 no. 2; *Laures 1957*: 39–41; *Sugano 1974*: 95–97. The *impressum* reads: *Iesvs no Companhia no collegio Cazzusa ni* (The College of the Company of Jesus at Cazusa). The village of Kazusa is southeast of Nagasaki on the south coast of the Shimabara peninsula. With thanks to the staff of the Marciana Library, Venice, for permission to consult this book.

299

A possible candidate for engraving the plate is P. Giovanni Nicolao, an Italian Jesuit with a training in oil painting and head of the Jesuit art school in Amakusa (see below), later in Macao; *Jennes 1943*: 133. F. Giovanni Battista Pesce had learned typographic printing in India, was in charge of the printing of the books and he may have provided further technical support in printing; *Laures 1957*: 10, 19–20. The Japanese Christian Constantino Dourado had travelled with the Tenshô Embassay as an assistant. He learned how to cut matrices for casting letters in Portugal, typographic printing in India, and would have worked for the press until 1595 when he joined the Jesuit order. Because of his engraving and printing skills he may also have been involved in the early production of engravings; *Laures 1957*: 9, 21, 30. For other Japanese involved in the production of Christian books in Japan until 1614 see: *Laures 1957*: 21–24.

300

The printer might have run out of supplies (pigment, oil varnish) brought from Europe and may have turned to local materials instead.

301

'These *seminarios* were schools for the training of Japanese catechists rather than theological seminaries'; *Laures 1957*: 6 n. 22. The town of Amakusa is across the water from Kazusa on Shimoshima Island. The books printed in this period carry the *impressum* 'Amakusa' (*Iesvs no Companhia no Collegio Amacusa ni*), but where exactly the seminary was established and whether the actual printing was done in the town of Amakusa is unknown.

302

Boxer 1967: 199, Japanese pupils printed copper plates in 1596; *Chibbet 1977*: 62–65; *Fuchs 1950*: 78 n. 3; *Hosono 1978*: 24–25; *Jennes 1943*: 78, 132–137; *Kôso 2000*: 27–28; *Nagayama 1918*: no. 8; *Schilling 1940*: 371; *Sugano 1974*: 69–117; *Sugano 2003*: 11–29. The Jesuits did the same in Paraguay, see below: 'South America'. See also Chapter 2, p. 89.

303

F. Giovanni Battista Pesce also moved to Macao and probably set up the press again in 1620; *Laures 1957*: 20. P. Giovanni Nicolao and his Japanese pupils moved to Macao, too; *Jennes 1943*: 133; *Standaert 2001*: 815.

304

Laures 1957: 24–25.

305

Chronology 1999: 35, 38, 44; *French 1974*: 6.

306

French 1974: 42–43.

307

Kobe 1996: 57, note that the print is reproduced in reverse here. Kôkan mentions in his memoirs that he made his first etching in 1783; *French 1974*: 42–43, 127–128. For the calculation of the date according to the Western calendar see: *Tsuchihashi 1952*: 109.

308

Sugano 1974: 126. Because nitric acid was unknown the Japanese first borrowed the Dutch term *sterk water* (strong water) around 1800, using their own term *sho-san* later on; *Sugano 1974*: 498; *2003*: 46.

309

Shirahara 2008: 120. I am grateful to Akira Tsukahara for discussing this possibility and for discussing early Japanese etching in general.

310

Savage & Smith 1979: 323–327; *Smith 1981*: 282–283. The chemicals used by Japanese *tsuba* makers were the same as those used by European etchers working with a salts-in-vinegar mordant, see Chapter 3, p. 201.

311

Sugano 2003: 105–107.

312

Clark 1994. Described are etchings 'issued from the 1830s to the 1880s, and chiefly in the 1850s and 1860's'. For a list of Japanese etchers,

see pp. 67–68.

313   *Conant 1999*: 31–33.

314

European engravings, book illustrations and oil paintings were copied in Chinese painting and woodcut techniques from the early seventeenth century onwards; *Jennes 1943*: 80–113; *Standaert 2001*, 1: 809–829; *2006*. The Jesuit art school in Japan mentioned above also produced works for export to China and the school moved to Macao in 1614 as mentioned above, but this does not seem to have caused any dissemination of engraving techniques in China; *Jennes 1943*: 78–79, 133.

315

Needham & Wang 1965: 211–222; **Zonca** (Bejing 1627).

316

Zonca (Padoua 1607): 76–78.

317

Fuchs 1950: 74–81.

318

On Western books in China see: *Golvers 2005*. For the article on engraving in the *Encyclopédie* see: *Diderot & D'Alembert 1751–1781*, 7: 'Gravure': 877–899 and 8, 'Imprimerie en taille douce': 620–623; **Bosse** (Paris 1745), the later edition of '1758' was not actually published before 1769.

319

Delmas 2005: 87; *Furcy-Raynaud 1905*: 100–105, 107–109, 114–119, 122–123, 130–132, 136, 200; *Szrajber 2006*: 39.

320

For reproductions of the prints mentioned see: *Machida 1995*: 276–333; *Pirazzoli-T'Serstevens 1969*; *Standaert 2001*: 829; *Szrajber 2006*. Personal correspondence with Akira Tsukahara in 2007.

321

Guang 2000: 20; *Li 1996*: 16; *Spence & Chin 1996*: 83, 106–107.

322

Pardo de Tavera 1893: 45–48; *Toribio Medina 1958*, 2: 25–31, especially n. 37.

323

The text on the print reads: *CORNELIS SPEELMAN GOUVERNEUR GENERAAL VAN INDIA Etc. Joannes De Jongh. ad vivúm Faciébat. et Scúlpsit. et excúdit. Batavia. Aº. 1684.*

324

Hollstein Dutch & Flemish, 9, Joannes de Jongh: 221–222 no. 5; copper plate on loan to the Rijksprentenkabinet, Amsterdam, inv. NG-BR-942; *Loos-Haaxman 1968*: 12.

325

Loos-Haaxman 1968: 198 (Nahuys, perhaps); **Poortenaar** (Amsterdam 1930): front., pl. opp. p. 48; *Waller 1974*: 16–17 (Bauer), 259 (Poortenaar). Jan Toorop was born in Indonesia of mixed parentage, migrated to the Netherlands at a young age, and never returned to Indonesia; *Waller 1974*: 327.

326

Needham & Wang 1965: 122–123, figs 417–420. The cotton gin was adopted by the Chinese around 1300.

327

Jennes 1943: 44–67.

328

For the history of printmaking in India see: http://www.saffronart.com/sitepages/printmaking/history.aspx (2010).

329

Rohatgi & Godrej 1989: 126, with further references to literature and sources. The introduction of Western art and craft techniques continued, however, seeing the Indian publication of **School of arts improv'd** (Calcutta 1830).

330

http://banglapedia.search.com.bd/HT/A_0310.htm (accessed 2006, no longer available).

331

Dakoji 1998: 10.

332

Khan 1994: 12.

333

Some plates of this publication are dated '1802' and 'the copy [of the 2nd edition of 1813] has preserved the imprint at the foot of plate 1 as "Published as the Act directs Dec. sixteenth, 1804"', while the earliest watermarks are dated 1802; *Australian 1967*: 111–112; *Butler 2007*: 6–20; *Ferguson 1986*: 161–162, 184–185, 223–226, 331; *Wise & Wise 2009*. The hand-colouring was perhaps done by his wife.

334

Hunnisett 1998: 51–52.

335

Koehler (New York 1885). The publisher Cassel had offices in New York, London, Paris and Melbourne.

336

Sims 2011.

337

Shadwell 1969: 23–24, pl. 25.

338

Allodi 1980: 2-3, pl. 1

339

Ibid., xi-xii, 2ff.

340

Ibid., 199.

341

Ibid., xi; *Hunnisett 1998*: 51. Nearly all manuals on printmaking used in Canada are imported, see also: *Savoie & Ouvrard 1973*. Printmaking was introduced to Canadian Inuit after the middle of the twentieth century; *Hopkinson 2010*.

342

McNeely Stauffer et al. 1994, 1: 54–55, pl. opp. p. 6.

343

Larson 1985: 4; *McNeely Stauffer et al. 1994*, 1: 78–80, pl. opp. p. 10 (first state) and 2: 164–165; *Shadwell 1969*: 17–18, fig. 6 (second state); *Wroth 1994*: 284. The portrait is found in Thomas Emmes's publications *Blessed Hope* (1701), *Ichabod* (1702) but only one copy with the portrait is known, and *A discourse proving that the Christian Religian is the only True Religion*.

344

Hind 1963-1: 211–212; *Wroth 1994*: 290.

345

AKL, 27, 'Dewing, Francis': 13: Dewing was active in Boston from 1716 to 1723, he then returned to London where he was active until 1745. *Larson 1982, 1985*: 4; *McNeely Stauffer 1994*, 1: 64–65; *Shadwell 1969*: 33 fig. 48; *Wroth 1994*: 285.

346

Thomas 1970: 380–382, 442.

347

Wroth 1994: 35, 285.

348

Hunter 1978: 492ff; *Wroth 1994*: 285–286.

349

Larson 1987: 23–31; *Wroth 1994*: 291–294.

350

Larson 1987: 37, 43–44.

351

Wroth 1994: 290–291.

352

See also Chapter 3, p. 134 and Chapter 4, p. 304.

353

Hunnisett 1998: 329–343.

354

Instrumental were the French publisher Alfred Cadart, who sailed to New York in 1865–1866 to promote the modern French printmaking of the Société des Aqua-fortistes, and Sylvester Rosa Koehler as editor of the *American Art Review* and author of publications on modern etching in the 1880s; *Ackley 1978*; *Bailly-Herzberg 1972*: 211–213, 273; **Koehler** (New York 1885); **Lalanne** (Boston 1880); *Schaar & Hopp 1977*: 51; *Schneider 1982*.

355

Austin (1874); **Bishop** (Philadelphia 1879).

356

McLaughlin (Cincinnati, Ohio, 1879). Other manuals on art techniques have been published by her in 1880, but probably not this one.

357

Hamerton (Boston, Mass., 1881); **Koehler** (New York 1885); **Lalanne** (Boston, Mass., 1880).

358

Schneider 1982; *Wilson 1985*: 194.

359

Donahue-Wallace 2006: 136, 139; *Thompson 1962*: 11–12; *Toribio Medina 1958*, 1: 225–236.

360

Carrillo y Gariel 1982: 5–6; *Donahue-Wallace 2006*: 148.

361

Toribio Medina 1958, 2: 113.

362

Garrido 1996; http://jankert.enkevo.info/torculo/CronologiaGrabadoMexicano.htm (2010).

363

Toribio Medina 1958, 2: 160–166.

364

Ibid., 1, 479–482.

365

Original ed.: Juan Eusebio Nieremberg, *De la Diferencia entre lo temporal y eterno. Crisol de desengaños con la memoria de la eternidad, postrimerias humanas, y principales misterios Divinos*, new ed., Amberes [= Antwerp]: Geronimo Verdussen, 1684. The etched illustrations by Caspard Bouttats were copied for the 1705 translation; *Fabrici 1983*: 175–176, 182 n. 1.

366

Fabrici 1983; *González Garano & González Garano 1942*: 10, 27; *Sebastian 1992*; *Toribio Medina 1958*, 2: 368; *Wroth 1938*: 206.

367

Benavidez Bedoya 1999.

368

Gutiérrez Larraya (Buenos Aires 1944). **Palomino de Castro y Velasco** (Buenos Aires, repr., 1944), reprint of the ed. Madrid 1715–1724,

containing instructions for etching in vol. 2. **Zaidenberg 1** (Buenos Aires 1945), a translation after the edition New York 1944 (?), containing instructions for drypoint and etching on pp. 125–142.

369
Christian 1995: 15; *Souza 2008*: [1], [5].

http://www.brown.edu/Facilities/John_Carter_Brown_Library/CB/impressao.htm (2010).

370
http://www.tntarte.com.br/tnt/scripts/biografias/carlos_oswald.asp (2010).

371
See Chapter 2, p. 91.

The Trade of Intaglio Printmaking

> Though man's trouble and labour is a punishment for the lost Paradise, still by these we can be in friendly relation with our Great Creator and Foreman.
>
> *Manfred Lautenschlager*[1]

This chapter concerns the trade of intaglio printmaking. It discusses its economics, the guild system, education, workshop furnishings and the supply of equipment and materials. All these show a growing efficiency by the emergence of various disciplines in intaglio printmaking after 1500, with the separation of the graphic arts from the printing trade in the period 1850–1870 and the subsequent emergence of today's artist-printmaker.

Giving some consideration to economic developments provides a better understanding of the many graphic processes that appeared in the history of printmaking and the role they played in artistic concepts. The subject of professional development in printmaking needs further study, but is introduced here by a number of examples. The consequences of either separating or merging – for economic or idealistic reasons – the designing, engraving, printing and publishing of prints encouraged the debate about originality in printmaking in the second half of the nineteenth century and once more in the latter half of the twentieth century.[2] The mechanisation in the printing trade stimulated new ways of manual printmaking.

Gender study is not part of the present work, but where applicable women active in intaglio printmaking are mentioned. Female engravers and publishers are recorded from around the middle of the sixteenth century. The position of women in printmaking needs further attention, however, because some engravers' and plate printers' wives appear to have assisted their husbands in the business.[3] Today we can observe that more women than men are active in printmaking, both professionally and as amateurs.

Engravers and Plate Printers

Early engravers were also their own printers and publishers, but some copied other craftsmen's designs and prints.[4] Further separation between designing, engraving, printing and publishing followed and new disciplines were established. Print publishing emerged in this way in Italy in the first half of the sixteenth century, and in Antwerp from 1550, to develop as an independent branch. After further specialisation in the period following, the various printmaking activities converged again in the second half of the nineteenth century, until the present situation was reached where the printmaker designs, produces and prints his own plates.[5]

Engravers are frequently recorded from 1500 onwards but plate printers only rarely. This raises the question as to whether and how often the engraver still printed his plates in the sixteenth century. Where and when did the disciplines of engraving and printing separate? When did the engraver stop proofing his own plates to leave it to a professional printer? Where and when did this situation evolve to the present position that regards a print only as an 'original' if the artist designs, makes and prints his own plate?

Very little research has been carried out on the role of the plate printer in this process.[6] The job obviously is necessary for the production of the print, but underrated by many.[7] According to Christian Ludolph Reinhold (1788), printing a copper plate is a true art, but it is also hard work carried out by 'rough-knuckled' (*grobknöchichte*) men.[8] In other words, printing was not done by the type of sensitive intelligent person that engravers would wish to take care of

their precious plates. Various authors before and after him therefore advised engravers to keep a watchful eye on the printing.[9]

Special attention needs to be paid to the presence, or absence, of professional plate printers. When studying printmaking in a particular place or period, one consideration would be whether the engraver printed his own plates or if a printer was available. This yields information that can be used as a guide to the development of intaglio printmaking as a whole. Professional plate printers appeared early in the sixteenth century and their discipline developed to such an extent that it became uncommon for an engraver to own a press and print his own plates.[10]

Particular forms of division of labour are conceivable in fifteenth-century workshop situations. The engraver in his private studio may have left the repetitive job of editioning his plates to an assistant. A larger studio may have divided up the activities of designing, engraving and printing between several workers in order to improve the speed of production.

In general – but heavily dependent on the local situation and the particular period – designing, engraving, printing and publishing prints started separating and developing as specialist disciplines after 1500. Engraving and printing were not performed by one person or in one workshop from roughly the first half of the seventeenth century until after the middle of the nineteenth century. Instead cooperation between designers, engravers, plate printers and publishers emerged.[11] We find this reflected in the terms in addresses of prints: designs were made by one artist (*invenit*), possibly after the work of a painter (*pinxit*), to be cut or etched by an engraver (*sculpsit*), his plates printed by a plate printer (*impressit*), while the publisher issued the print (*excudit*), the project often being financed by someone else (*sumptibus*), and the overall organisation might be in the hands of yet another party (*direxit*) if not by the publisher.[12]

These terms express the interrelations between those involved and the dynamism of the printmaking world. Ideas about division of labour began to change by the end of the eighteenth century towards the engraver proofing his plates until it became a preferred working manner for artist-etchers. This movement grew until it was considered obligatory in the 1960s that the artist should carry out the complete printmaking process himself in order for his prints to be truly original, which is still the present situation.[13]

Economics

The following cases from Italy, Antwerp, Holland and France sketch the professional development of intaglio printmaking in Europe from the sixteenth to the nineteenth century. As to how far they represent developments in central Europe, Spain, England and Scandinavia remains open pending further research.

Italy
The first documented steps towards professionalism were taken in Italy. Mantegna hired the young goldsmith Gian (Zohanne) Marco Cavalli to produce prints after his designs in 1475.[14] The contract states that Cavalli will engrave and print copper plates, return everything to Mantegna who will not print or have printed the plates without first informing Cavalli.

Florentine Alessandro Rosselli, son of the engraver Francesco Rosselli, earned a living by printing and publishing plates made by his father and other engravers, but he did not engrave any plates himself.[15] His case is exceptional as the majority of engravers still printed their own plates or had assistants for printing. Raphael had his designs engraved and the plates printed, the production being managed by Baverio dei Carocci (Il Baviera) from around 1515 onwards until Raphael's death in 1520.[16] Il Baviera inherited Raphael's copper plates and continued to have them printed and published. By 1525 he also ordered designs to be made, had these engraved and the plates printed. In this way he became the first professional print publisher, without being an engraver or printer himself.[17]

Print publishing started to flourish in Rome, due mainly to Antonio Salamanca and Antoine Lafrery. Active from before 1530 and 1540 respectively, they united their businesses in 1553 until Salamanca's death in 1562,[18] thereby strengthening their position in the highly competitive local print market.

Professionalism developed and by the time Cornelis Cort, who worked in Rome, died in 1578, he must already have been a specialist engraver because no press is recorded in the inventory drawn up after his death.[19] The separation of disciplines can be seen in Stradanus's interior of a printshop (c.1591): engraving and printing are carried out by different craftsmen who are dressed differently and occupied in different activities – the engraver working seated and the printers standing (Fig. 64).

The printmaking business expanded rapidly until 1622 when 75 publishers and printers of woodcuts and engravings were recorded in Rome, their workshops concentrated in the neighbourhoods of Parione and Ponte, behind the Piazza Navona.[20] Only under such circumstances could complete division of labour be accomplished.

Antwerp

The growth of the printmaking community in Antwerp in the sixteenth century allowed for an early separation of disciplines. Three examples show its developing efficiency.

Hendrik Terbruggen (Pontanus) was active as an engraver, plate printer, mapmaker and music printer in Malines. To settle a debt with Engele Henrickx, wife of book printer Jan de Cock in Antwerp, he promised by contract to surrender to her his roller press, twenty-four copper plates and printing utensils on 4 September 1540. Within three years the debt was settled and everything returned.[21] Apparently Terbruggen could continue his engraving and other activities while Engele Henrickx used the roller press for printing Terbruggen's plates only.[22]

Engraver Hieronymus Cock, the first specialist print publisher outside Italy, is thought to have travelled to Italy in 1546–1548. If so, he would have learned about the way prints were published in Rome. Cock introduced division of labour in Antwerp, with specialist designers, engravers and plate printers who he, as the print publisher, contracted. This led to increased efficiency and his publishing house, In de Vier Winden (Aux Quatre Vents), became so successful and grew to such a size that Cock finally stopped engraving himself, the enterprise producing 1100 prints between 1548 and 1570.[23]

For the printing of the copper engravings of the *Vivae Imagines* (1566), Peeter Huys was contracted by book publisher Christophle Plantin.[24] Plantin employed different plate printers, and five years later he contracted Jacob van der Houven for such a project.[25] The records of the Moretuses, who continued Plantin's business, often list payments to plate printers too, and in other instances the contracted engravers printed their own plates.[26] This indicates that plate printing was not performed regularly at their premises until the Plantin office finally had a roller press installed in the printshop in 1714 and employed plate printers on a permanent basis from 1717.[27]

Holland

In the northern Netherlands professional developments started later. Except perhaps for the occasional itinerant printmaker passing through, intaglio printmaking was not practised in Holland and a wide area around that province until the beginning of the sixteenth century. Lucas van Leyden was virtually the first Dutch artist to practise copper engraving in Holland, which raises the question as to where and from whom he learned engraving and printing of copper plates. The suggestion is that he studied engraving locally, as the burin was used by various metalworkers such as casters of pewter, brass and bronze, goldsmiths, or decorators of other metal objects.[28] However, those craftsmen did not professionally print engraved plates in editions on a roller press. Plate printers per se were absent in Holland, and proofs and editions of Lucas's plates were therefore printed in his own workshop.[29] His prints show that they were produced by means of a roller press; they were not made by rubbing.[30] The qualities of the impressions, however, ie of the ink and of the wiping of the plate, differ throughout the 30 odd years he produced prints, demonstrating that intaglio printing had not yet reached a professional level and was still developing.[31]

Engravers in Haarlem would have carried out the printing themselves around the middle of the sixteenth century. Dirck Volkertsz. Coornhert engraved, and likely also printed and published there in 1548–1552/3 – his plates from this period do not carry a publisher's address. The printing of editions would have been arranged in Antwerp only later, when Cock started publishing Coornhert's plates.[32] Coornhert's apprentice, Philips Galle, first worked as an engraver for Cock too, but later established himself as an independent print publisher, thus also a plate printer, in Haarlem from 1563 to 1570 before moving his business to Antwerp after Cock's death.[33] Whether Galle had a printshop connected to his firm or if he contracted someone to print his plates is not known.

Gillis van Breen seems to have worked as block and plate printer to Hendrick Goltzius in Haarlem around the 1590s.[34] Similarly, by 1595, Pieter Bailly was printing plates for the Raphelengen book publishers, Plantin's Leyden branch office.[35] As we now appear to have two instances of printers working for engravers this perhaps could be interpreted as printmaking having become more professional in Holland by that time. Throughout the seventeenth century we find Dutch print dealers who also seemed to have printed copper plates themselves or, better still, who had the plates printed in their own shops.[36] An early example is the Amsterdam book and print dealer Cornelis Claesz., who offered 'prints from the plates in his possession' in 1609, while 'several presses' were offered for sale upon his death in 1610.[37] In a dispute in 1620 between two groups of Amsterdam print dealers about a set of engraved plates, the publisher Jan Jansz (Joannes Jansonius) remarked 'that he shall give the plates to his printer in order to print them',[38] referring to one of his employees who specialised in plate printing.

Inventories of several Dutch engravers active in the first half of the seventeenth century show that they owned roller presses; it is also possible that they printed for fellow professionals.[39] Some book printers also printed copper plates in their shops (Fig. 65; see also Fig. 73). The first professional plate printers are recorded at the same time.[40] Such observations suggest that it was possible for engravers and plate printers to specialise and to make a living from their professions in the larger Dutch towns by the middle of the seventeenth century. This is further illustrated by the 1662 establishment of the newly founded Amsterdam guild of book printers, book dealers and print dealers (Fig. 66).[41] The guild also included other craftsmen, such as book binders and plate printers, the latter having been unorganised up to then. The engravers stayed with the guild of St. Luke – in other towns both engravers and plate printers were members of this guild.

France

Jehan Baptiste Cribel, *docteur en medecinne et astrologye*, brought with him a pot of intaglio printing ink when he visited Paris on 24 and 25 April 1566. He showed the pot to several engravers and ink makers, soliciting, in the presence of two notaries, their opinions about the quality of the ink. In particular, his visit to engraver René Boyvin, and Jehanne Phelippon, his wife, who made printing ink, in their room in a house in the Rue du Paon in Saint-Germain-des-Prés, demonstrates the still close connection between engraving and plate printing in Paris at the time.[42] That changed when the Tavernier family moved from Flanders, and started their printmaking and publishing activities in Paris in 1573. With more Flemish engravers and plate printers arriving after the sack of Antwerp in 1585, both engraving and plate printing evolved greatly in Paris and the city was soon to become a centre of print-making.[43]

Mattheus Merian the Elder (1641) and Abraham Bosse (1643) expressed the growing separation between making the plate and printing the plate. Both created separate but coherent images of an engraver's studio and an intaglio printshop: Merian with two images on one plate (see Fig. 11, p. 12) and Bosse on two different plates (Figs 67 and 68). Merian prepared a plate illustrating a text on printmaking. Engraving and etching are mentioned only briefly, but plate printing is given a little more attention and the author finishes by referring to the adjoining figure that showed the process in further detail.[44]

Bosse made two separate images for more personal reasons. While Melchior Tavernier was *graveur et imprimeur en taille-douce du Roy*, his apprentice Abraham Bosse was only 'engraver to the king' and no longer a printer.[45] Bosse engaged in attempts to prevent the formation of a Paris guild of engravers and finally engravers gained admittance to the Académie Royale de Peinture et de Sculpture.[46]

Paris engravers always remained free, but when Louis XIV provided the opportunity for the formation of new guilds in 1691 – as a means of raising money – the plate printers saw their chance to create a monopoly for themselves and they founded their own guild in 1692, further emphasising the separation of disciplines.[47] The new guild was heavily in debt – it had cost 30,000 *livres* to establish – and engravers largely ignored the monopoly of the plate printers. The consequence was a growing impoverishment of the plate printers.[48]

The situation in the French provinces was more diffuse than in the capital. For example, father and son Beaujean worked as both engravers and plate printers in Toulouse in the last quarter of the seventeenth and the first half of the eighteenth century.[49] Centralised regulation came with the verdict of the Conseil d'Etat du Roi of 1734, whereby French engravers were allowed to own presses for proofing their engravings. Proofing should be carried out by a professional printer, though, and printing editions on this press was not allowed in order to prevent competition.[50]

Additionally, in 1741 Paris plate printers gathered together in order to take measures to improve their situation by reorganising the work among themselves more equally.[51] They also fixed tariffs and sued engravers for violation of the plate printers' monopoly. That seemed to work – in 1767 when Jacques-Fabien Gautier-Dagoty printed his own plates it brought him into conflict with the Paris guild of plate printers.[52] The rules were maintained fairly rigidly. When a few years later cabinetmaker André Jacob Roubo compiled his *Art du menuisier*, he included a design for a small roller press. He stated that this press could only be used by *personnes de considération*, who needed a permit to have it constructed.[53]

Other countries

In other countries regulations were not that strict or simply did not exist. Weigel's German version (1698) of Jan Luyken's *Het menselyk bedryf* explained that engravers in Germany, who lived too far away from active plate printing centres, could own a press.[54] Voit and Krünitz repeated Weigel's remark a century later, Voit adding that art dealers, such as those in Augsburg and Nuremberg, were also permitted to operate their own presses.[55]

English engravers were not restricted in printing their own plates and they commonly printed themselves.[56] Engravers and plate printers in England (ie London) were free. They never had their own guilds, nor were they obliged to be members of the Stationers' Company, although some joined this or other guilds.[57]

There was not enough work for specialised plate printers in the English colonies in America. For this reason English engraver Francis Dewing brought a roller press with him when he arrived in Boston in 1716.[58] Half a century later the situation had changed little and up to the middle of the nineteenth century a number of American and Canadian engravers were still printing their own plates.[59] Employment was improving in the youthful United States, however, and William Norman managed a flourishing printshop in Boston before 1800.[60]

A new economy

France led the way when it not only abolished its guilds in 1791 but also the guilds in all the European regions and countries it occupied in the years following. This was followed by technical innovation, increasing production and commercialisation. A landmark in this process was the public presentation of Louis Daguerre's photographic process in 1839, which resulted in the accelerated development of photography and photomechanical printmaking.[61] The huge potential of photography in the reproduction of imagery was quickly realised, although manual etching and en-

graving in the printing trade continued for several more decades.

American engineer Jacob Perkins introduced the first all-metal roller press in England in 1813, following his inventions in steel engraving.[62] This process was further improved in the 1820s with editions from steel plates outnumbering by ten times or more those pulled from copper plates.[63] Due to the rise of the printing trade and despite competition from other graphic techniques, the business of intaglio printmaking increased enormously in western and central Europe.[64] Engraver John Pye estimated in 1836 that the number of engravers active in England was five times higher than 20 years before.[65] The simultaneous issue of the first monograph on intaglio printing by Berthiaud (1837) demonstrates the scale of specialisation.[66]

The establishment of large printing houses meant a change from the one-press workshop to larger factory-like activities, either expanding one workshop's activities or combining a variety of printing methods under one roof (Fig. 69).[67] In 1816, Ramshaw's London workshop operated thirteen stoves.[68] McQueen's in London accommodated twenty-five to thirty presses and the atelier Salmon in Paris housed more than thirty presses in the second half of the nineteenth century.[69] The 1855 census of printshops in Austria and Germany listed the names of 197 intaglio printshops in 52 towns holding altogether 616 presses. By far the largest was Das Bibliographische Institut in Hildburghausen with seventy roller presses.[70]

But changes were already on their way, marked by the official presentation of the daguerreotype process on 19 August 1839. This first operational photographic process immediately encouraged experimentation. Because daguerreotype plates were unique and could not be multiplied, ways were sought to turn the photographic process into print and consequently a host of photomechanical printmaking techniques emerged.[71] Parallel to these developments, the invention of galvanisation in 1837 and growing mechanisation stimulated the rise of the printing trade. Galvanisation allowed the replication of printing plates (electrotype) as well as coating the softer copper with harder metals (steelfacing) in order to prevent wear of the plate; both processes allowed for the printing of extremely large editions.[72] Mechanisation of typographic and lithographic printing proved successful, while the mechanisation of intaglio printmaking had to wait for the development of new intaglio processes until rotogravure became practical by 1895.[73] The printing of photogravures (invented 1879) could only be done manually, which was seen as inherent to the process.[74]

The introduction of photomechanical techniques in combination with the mechanisation of printing resulted in a rapid expansion of the printing trade. At the same time manual work became redundant as is made clear by the subsequent decline in the number of intaglio printshops after 1860.[75] The creation of images was no longer limited to the gifted amateur or the talented artist, the engraving of plates was no longer a specialised craft and the printing of plates was taken over by machines. In response, societies of artist-etchers were established whose members proposed that the artist should etch his own plates by hand only and, furthermore, he should proof his own plates in order to create original works of art.[76] The printing of editions was usually still left to professionals however. Plate printers were given commissions for high quality artwork thereby allowing them to keep their workshops.[77] It is also the first period in history to provide detailed records of individual plate printers, the most famous among them being Auguste Delâtre in Paris and Frederick Goulding in London.[78]

Guilds

Few special guilds for engravers or plate printers were ever established – they usually joined the guild of St. Luke for artistic intentions. However, engravers were often skilled in other crafts too and could be obliged to be members of another guild or even two guilds.[79] Another phenomenon to consider was the communities of craftsmen operating outside guild regulation, such as in monasteries and at courts of the nobility; there were also peripatetic craftsmen.[80] Furthermore, it depended on the time and place as to whether engravers and printers had to be members of a guild or whether guilds existed at all.[81]

Guilds maintained control over the quality of the products, ensured fair competition, secured the rights of their members, and dealt with social issues for members and widows of members; they also regulated the training and protection of apprentices.[82] When urban populations, economies and the number of craftsmen began to expand in the late fifteenth century, the mediaeval guild system had to be modernised and craftsmen reorganised in new guilds.[83]

In Netherlandish towns, printers and engravers were usually members of the guild of St. Luke. Any craft related to the printing trade was incorporated in the Antwerp branch of the guild in 1558, thus including engravers and plate printers.[84] Booksellers and allied trades of the book business broke away in seven north Netherlandish towns, starting in Middelburg in 1590, with the result that plate printers in Amsterdam, who had been unorganised until then, became members of the new guild of booksellers (etc.) from 1662, while engravers stayed with the guild of St. Luke.[85] This was not the case in Haarlem, however, where both engravers and plate printers remained with St. Luke.[86] This situation existed until, as mentioned above, the French guilds were abolished as well as those in the European countries occupied by France thereafter, and consequently every artisan was free to set up his own business.[87]

Apprenticeships

The start, duration and cost of apprenticeship were decided by the guilds and seem fairly consistent. For example, the regulations of the Amsterdam booksellers' guild, to which the plate printers belonged, set the minimum age of an apprentice at 12 years old and the length of apprenticeship at four years. Registration was obligatory, the boys – female apprentices are never mentioned – received modest weekly wages and an age limit of 25 years old was agreed upon in 1786.[88] The length of apprenticeship for engravers and plate printers was likewise three to four years.[89] This could be extended with a few years being served as a journeyman before being allowed to become masters themselves.[90] This was common in the book printing trade and would not have been much different for engravers and plate printers.[91]

In Paris, from the establishment of the guild of plate printers in 1692, a master plate printer could take only one pupil at a time and the period of apprenticeship was four years.[92] The fee was 500 *livres* but sons of masters paid only half this price. The former apprentice had to work for another two years for his master as *compagnon* before he could present his masterpiece, a proof mounted behind glass in a gilt frame, in order to become a master himself.[93] The regulation would have been a reflection of common practice, because similar limitations on the number of apprentices and journeymen are known in the book printing trade.[94] Maybe such a custom is depicted in Bosse's printshop of 1643 that shows a young man turning the press and two men wiping plates (see Fig. 68). The man with cap, moustache and goatee beard (front left) seems the oldest of the three and the master of the printshop. The young man turning the press could be the apprentice, because Krünitz (1792) called him *Lehr-Burschen* (apprentice) in his copy after Bosse.[95] The person in the background is probably a journeyman.

Something similar can be seen in German-speaking countries. Plate printers in Austria and Germany were not bound to a guild, but did act according to certain conventions.[96] Apprenticeships lasted for three years, during which period the local government protected the pupils. German engravers were allowed to own a press to print their work and some trained servants to do the printing. This could be the situation depicted by Matthäus Küsel in 1680. His interior of an engraver's studio shows the master engraver working on the left, with an apprentice engraving behind him and a pupil drawing a sculpture on the right.[97] In the backroom two more assistants are busy grinding ink and printing (Fig. 70).

Differences between the capital and the provinces, as well as between the sixteenth century and later periods can be observed in France.[98] Initially masters did not charge for apprenticeships – this came in only after 1600.[99] Melchior Tavernier took Abraham Bosse, then aged about 16, as his apprentice for a period of three years in 1620, a service for which Bosse's mother paid Tavernier 100 *livres tournois*.[100] Prices rose in the eighteenth century, but they were higher in Paris than in the provinces. Jean Michel, engraver in Avignon, accepted Jean-Joseph Baléchou as an apprentice for a period of three years, from 1731 to 1734. Baléchou's father paid 250 *livres de France* for the apprenticeship, while in Paris the rate varied from 1200 to 1600 *livres*.[101]

Two case studies

Guilds regulated the workshops and contracts stipulated that parents should pay the apprentices' costs of training, lodgings, food, drink, clothing and laundry.[102] Two case studies from the associated craft of book printing are presented for comparison.[103] The first is that of the German orphan Johann Daniel Dilesius, who travelled to Frankfurt am Main in the middle of the Thirty Years War. Letters to his indifferent foster parents tell a poignant story about poor living conditions, loneliness and lack of money, until the young man fell sick and died in 1639.[104] The effects of war would have caused many such unhappy situations. Normally, either guild rules provided sufficient protection or the overseers of the guilds kept an eye on apprentices. The regulations of the Paris guild of plate printers, in particular, ordained that the syndics should pay four visits per year to a printshop.[105]

In 1688 an Amsterdam book printer was reluctant to pay a pupil in his first year because business was slow. The overseers of the booksellers' guild, which included the plate printers, decided the printer had to pay weekly, as was customary, and that the boy was to be paid extra in his second year.[106]

Engravers

Intaglio printmaking involves two aspects: the making of the plate and the printing of the plate – or in the terms of this study 'producing the matrix' and 'printing the matrix'. This combination covers the production of the print. At the beginning of intaglio printmaking all tasks would have been performed by one person, but division of labour within a studio was a given. The master did the artwork, designing and engraving the plates while his apprentices or assistants did the 'dirty' work – sanding and polishing the plate, grinding the ink, and printing the plates until conditions became favourable for the separation of the different disciplines.[107]

Working hours

Not much can be said about working days and hours for engravers because they usually worked at home and by contract, ie not regular hours. Occasionally we come across remarks about how tardily some engravers worked.[108] Working hours were sometimes regulated by contract. For example, Prevedari's contract (1481) concerning the engraving of a plate after Bramante's design stipulated that he had to work day and night during a period of two months.[109] But he also had to work at the house of his contractor who could therefore keep a watchful eye on him. René Boyvin would work from 5.00 am to 7.00 pm from mid-March to mid-September, otherwise during daylight hours, when he was contracted for two years by Pierre Milan in 1549.[110] The contract of 11 September 1600 between Simon Frisius and Jean de Beaugrand obliged Frisius to work two hours per day for Beaugrand during three months.[111] Robert Nanteuil preferred to work in the morning, because for him the morning light provided the best working conditions.[112] English eighteenth- and nineteenth-century references mention very long working days.[113] To summarise, working hours of engravers would have varied depending on stipulations in the contract, the amount of work available and on the conditions of the day.[114]

Status

The status of engravers changed through the centuries. During the Middle Ages all craftsmen were judged equally, while the visual arts gradually became more appreciated during the Renaissance.[115] Throughout the sixteenth century artists of various disciplines were similarly appreciated north of the Alps.[116] Artists such as Albrecht Dürer, Lucas van Leyden, Jacques de Gheyn and Hendrick Goltzius were admired for their engravings as well as their paintings (Fig. 71). Then, gradually, painting and sculpture came to be regarded as superior to engraving, a change that originated in Italy from around 1550.[117]

The Paris guild of metal (other than gold and silver) engravers was established on 1 December 1623.[118] These craftsmen cut anything except printing plates and consequently plate engravers were not counted among their members. Attempts were made to establish a guild of plate engravers in 1640, 1644 and 1651.[119] Twice, in March 1644 and once again in February 1651, Abraham Bosse played an important role in blocking these attempts. As spokesman for the Paris engravers he argued against the foundation of such a guild and as a result Paris engravers remained unorganised until the abolition of the guilds in 1791.[120] As another consequence of these activities, the statutes of the Académie Royale de Peinture et de Sculpture were changed and confirmed, after which professional engravers were admitted to this institution from 1655.[121] The independence of engravers of printing plates was confirmed in the *Edict de Saint-Jean-de-Luz* of 26 May 1660. The *Edict* was registered in 1662, the same year in which the Paris guild of engravers for the decoration of metal objects was forbidden to incorporate the *graveurs en taille douce*.[122]

In England engravers were not regarded very highly in the eighteenth century. Acceptance to membership of the Royal Academy happened only slowly – from associate membership at the beginning of the nineteenth century to full membership half a century later. The distinction between engravers and other artists was abolished in 1928.[123]

Plate printers

Biographical information about engravers is plentiful. Names of plate printers, on the other hand, are found only occasionally throughout the centuries, while the few biographies of plate printers that do exist have all been published in the past 100 years[124] and also include portraits of the printers discussed (Fig. 72). Some other depictions exist of plate printers we know by name (see Fig. 82), but apparently the genre was not popular.[125]

Working hours

Modern consensus maintains that in earlier centuries, craftsmen worked twelve hours per day. The regulations of the Plantin-Moretus workshop of 1715 ordained that the plate printers would come in at 6.00 am, not earlier, in order to allow them to attend Mass. The lunch break was taken between midday and 1.30 pm, and the men should remain at work until 8.00 pm.[126] This means they worked six hours in the morning and six and a half hours in the afternoon. 'Tea breaks' are not mentioned, but seeing the jugs underneath the presses in some printshop interiors, drinking would have been common to enliven the repetitive labour.[127] The regulations say nothing about working on Sundays and holidays.[128] Antwerp was a Roman Catholic town, so Sundays and the many Catholic holidays would have been observed properly, however, and particular feast days should also be taken into account.[129] An amount of about 250 actual working days annually would therefore seem acceptable, which gives an average of five working days per week.[130]

Number of printers

Most printshops had two or three workmen to one press, either because of guild regulations or common practice (Fig. 73).[131] Some printshops, however, had two presses.[132] Four roller presses are recorded in the 1667 inventory of the Amsterdam print dealer and publisher Dancker Danckerts.[133] The Amsterdam firm of Blaeu owned six roller

presses in 1664, nine roller presses in 1666 and ten in 1672.[134] Six roller presses and eleven book printing presses were offered at the auction of the Amsterdam book and plate printing shop of the Huguenots on 30 and 31 May 1730.[135] These numbers of presses suggest that several printers were employed in these shops but we do not know whether only one or more men worked at one press.

Paris plate printers were prohibited from keeping two printshops by c.1700.[136] Master printer Simon Collin circumvented this restriction in his own way.[137] By marriage to Marie-Madeleine Car(e)lot, widow of master plate printer Étienne Morin, he acquired the use (not ownership, which stayed with the widow) of this late master's printshop. He also accepted responsibility for Carlot's four little daughters from her earlier marriage and the new couple had two more daughters. Collin arranged for four of the girls to marry plate printers. Three of these plate printers became *compagnons* in his printshop. His own eldest daughter Madeleine-Charlotte married Thomas David, who became master plate printer four years after their marriage in 1734. Two sons of Geneviève Carlot, one of Collin's stepdaughters, became apprentices in his workshop. The result was that by around 1750 two master plate printers (Collin and David), three *compagnons* and two apprentices cooperated in one printshop that was equipped with four roller presses.

A century and a half later the author Henri Beraldi, writing in a footnote to the biography of the famous Paris printer Auguste Delâtre, describes how the apprentice inks the plate and does the initial wiping. The printer then continues by wiping with a fine cloth and finally by hand.[138] This evidences a particular form of cooperation in the printshop that relates not only to the quality of the impression (the master's touch) but also to the division of labour in the printing of editions.[139]

Discussion

The consequence of division of labour meant a difference in status, ie how particular activities and the craftsmen who performed them were viewed. The sixteenth century saw a growing emancipation of the artist, including the engraver. With the foundation of the Académie Royale de Peinture et de Sculpture in France in 1648, the acceptance of engravers to the academy in 1655 and the *Edict de St. Jean de Luz* of 26 May 1660, the status of the engraver – at least in France – was definitely raised above that of craftsman, while the printer continued to labour for modest wages. Paris, with Rome, being the centre of the arts in Europe projected its *mores* on other European countries, which accordingly followed the French model. After the abolition of the guilds, the introduction of photography and the expansion of the printing trade, the engraving of images declined to a mere mechanical procedure. The artist-etchers of the second half of the nineteenth century therefore concluded that a print could only be an original work of art if the craftsman-artist had designed produced and printed the plate himself. This conclusion was followed by discussions on the degrees of originality of particular prints.

Education

Information on the training of apprentice engravers and printers is relatively obscure; they learned their craft by explanation and demonstration, passed on from person to person. Apprentices entered workshops, the masters of which – before 1800 – were usually members of guilds. Guild regulations do not contain details about education nor do apprentices' contracts, and only a few references concerning the teaching of pupils have come down to us. No details are available about curricula or in what manner the apprentice was educated.

The training of artists began to be institutionalised with the establishment of the first art academy in Florence in 1563, its course being directed at *disegno* (from the Italian meaning drawing or design). Subsequently, painting, sculpting and architecture became part of the curricula of other such schools. References to engraving can be found two centuries later when this was taught at some institutions for the reproduction of painting and sculpture. Plate printing was rarely taught at any art school before 1900, until printmaking became an established part of the artist's education.

Teaching can be performed orally (by speech) and visually (by gesture) as well as by written sources. The earliest publications with recipes for intaglio printmaking appeared in the second half of the sixteenth century. The first monograph manual was published in Paris in 1645 with many following; these manuals usually made clear that they were intended for students and amateurs. Eighteenth-century encyclopaedias summarised the craft for a more general audience but were not meant for practical instruction. The majority of articles published in nineteenth-century journals were intended to inform professional engravers and printers on new materials and techniques. By the twentieth century manuals and articles were being aimed at amateur as well as professional artists.

Workshop training

Workshop training included explanation and demonstration, as shown by two examples concerning plate printing. In the new edition of Ptolemy's *Cosmographia* (Rome, 23 June 1477) we read that German publisher Konrad Sweynheim taught his Italian workmen how to print the engraved copper plates.[140] English printmaker Robert Macbeth, working in Madrid in 1887–1888, inquired about having his plates printed in the Government School of Printing which had four or five roller presses, but was dissatisfied with the results. The Spaniards were indignant. However, after some demonstrations by Macbeth and his brother they became interested in the new, English manner of working. Further incentive for cooperation was provided when master printer Frederick Goulding came over from London to print Macbeth's plates under the eyes of the studious Spaniards.[141]

Apprentices' curriculum

Apprentices probably started with such minor tasks as tidying the workshop and lighting the fire, before learning how to polish a copper plate to mirror shine, how to sharpen the burins perfectly, and how to engrave straight and curved lines.[142] Florentine engraver Domenico Tempesti came to Paris in 1677 to study under Robert Nanteuil. After Nanteuil's death Tempesti continued his studies under Edelinck and Mellan until 1680. He kept a notebook during his apprenticeship, extensively writing down and sketching what he had learned such as what shape a burin should have and what time of the day was best for engraving.[143] His notes were the result of his education, but he says nothing about how teaching was performed.

Drawing was an important part of the curriculum. Stradanus's printshop (c.1591) shows a boy copying a drawing or a print sitting at front left (Fig. 74). To the right two other boys show their drawing exercises to an engraver. Other engravers' studio interiors show boys copying prints or drawings, or drawing after plaster casts (Figs 75 and 78; see also Fig. 11, p. 12 and Fig. 124, p. 150). Learning by copying the prints of earlier masters was important.[144] The apprentice engraver cut the lines of his plate according to his example to come as close as possible to the original.[145] Alternatively training would have been undertaken by assisting the engraver with the workshop's business in between cleaning and shopping, meanwhile observing how the master worked.[146] Supposedly there was further specialisation in letter, music and map engraving, with portrait engraving being the most sophisticated. Combining etching and engraving for intaglio printmaking became standard in the sixteenth century; by that time etching would have been part of the curriculum.[147]

When the apprenticeship was completed it was considered important that the young engraver should travel and study further before starting work professionally. Rome was the ultimate destination for all those with ambitions to work in the arts in the sixteenth century and that continued to be the case in the seventeenth century for painters and sculptors, but less so for engravers, who tended to go to Paris instead.[148]

Despite the abolition of the guilds on the European continent around 1800, the training of apprentices would not have differed much either before or after that date as is reflected in Berthiaud's manual of 1837.[149] Berthiaud was the first to provide a more detailed account of the training of an apprentice plate printer. Apprenticeship still took four years, he explained, and the pupil could receive some payment in that period. He had to clean the rooms, shop for the other workmen, take care of their lunch and dinner, and deal with the lighting and heating of the workshop. Only then could he spend time on the actual printing process, such as cleaning the presses and stacking the work at the end of each day. If he wanted to earn a little extra money from the workmen he could ask permission to prepare their ink, brush paper, wash felt blankets on Sundays and hang the proofs on cords, but he was not obliged to do those things. From time to time he could pull some impressions.[150] This sums up what apprenticeship to a plate printer consisted of both then and perhaps before, but it does not really reveal the details of how and at what stage of his apprenticeship the young man actually learned the skills he needed.

Further options

Independent of the guild system there were other ways to learn the trade of printmaking. For example, a craftsman could demonstrate a particular working method to a colleague. An Amsterdam notary's act of 18 April 1611 states that the plate printer Broer Jansz will explain to David de Meyne, a printer-publisher, an 'invention' of his, whereafter De Meyne could decide whether or not to take part.[151]

Etching and occasionally engraving were practised by amateurs relatively often.[152] Men and women of the upper and middle classes spent their leisure time on printmaking.[153] Some courses and even a few manuals were aimed at women especially.[154] However we know very little about the educators who offered courses in engraving and etching, and of their teaching methods. The two manuals (1660, 1669) by the London drawing master Alexander Browne include instructions for drawing as well as etching, so perhaps he taught etching too.[155] But again any reference as to how he taught his pupils is absent.

A number of studies on print collecting and print history provided explanations of intaglio tools and techniques for the print lover or collector, or even contained straightforward instructions.[156] Adam von Bartsch began his volume on

print connoisseurship (1821) by stating that the print collector should also have a good knowledge of all the technical aspects of printmaking – engraving, etching, woodcut and lithography – before embarking on his studies of prints; this advice was followed by a thorough step-by-step description of the various processes involved.[157]

Deliberate secrecy is found, too. Ludwig von Siegen, inventor of the mezzotint technique, demonstrated the method to Prince Ruprecht von der Pfalz in the mid-1650s. Prince Ruprecht further developed the process and in turn demonstrated it to a number of other interested persons,[158] one of whom was the English scholar John Evelyn, who was the first to publish the mezzotint process in 1662 albeit without any technical details.[159]

Institutional training

The training of the arts was institutionalised on the basis that artists should also have a theoretical background.[160] The ideal art academy and its different disciplines are depicted in Cornelis Cort's engraving from 1578 (Fig. 75).[161] Students are drawing a human skeleton and a flayed corpse (*Anatomia*); there is modelling in wax or clay and carving in stone (*Sculptura*, *Statuaria*), while a painter is working on a large wall painting (*Pictura*). The bench on the lower right shows the architect (*Architectura*) next to the engraver (*Incisoria*). The image demonstrates how concept and the handling of matter go hand in hand.

Art academies
The earliest 'art academy', in the sense of a regular drawing course outside of the workshops, was the Academia del Disegno founded by Giorgio Vasari in Florence in 1563.[162] It was followed by a large number of other similar activities and institutions throughout Europe with expanding educational programmes in drawing, painting, sculpture and architecture.[163] Engraving does not seem to have been part of any European curriculum until the second half of the eighteenth century, although *Incisoria* is present in Cort's ideal academy.[164] Exceptions are found in the kinds of art schools that were organised by the Jesuit overseas missions in Japan and Paraguay.[165] It is interesting to consider to what extent the training provided by these Europeans might have reflected then current Western ideas about training in the arts.

Special schools or departments for teaching engraving appeared only after the middle of the eighteenth century. When the Madrid Real Academia de Bellas Artes de San Fernando was established by royal decree in 1752 its regulations did not mention printmaking, but it is perhaps the earliest art institution that also trained copper engravers.[166] In its first years Juan Bernabé Palomino acted as professor in engraving and had three pupils who studied with the aid of a state grant. The course was formally established in 1778 in order to train engravers to compete with foreign production. Grants to study in Paris and Rome were awarded, while chairs for steel and wood engraving were added in the nineteenth century. Training included the rendering of architecture, sculpture and portraits and the skilful copying of paintings was the highest attainable. Study sheets of the Madrid academy show exercises in the rendering of various textures and of details of the human body.[167]

The San Fernando academy served as a model for other academies in Spain and its colonies.[168] Later on, academic classes or even separate schools for engraving were established in a number of European cities[169] and more such courses appeared in the nineteenth century.[170] Whether drawing was part of the training is unclear, but it would have been a wise apprentice engraver who enrolled in extra classes. For example, steel engraving flourished in Birmingham and Edinburgh in the second quarter of the nineteenth century, its success being due to additional training of engravers at drawing schools – something that was lacking in the training of London engravers.[171]

Printmaking courses at modern art academies started at the School of the South Kensington Museum, now the Victoria and Albert Museum (V&A) in London. The school was founded in 1851 as a strong need was identified for a professional training in the arts and crafts as a result of the first World Exhibition in London in that year. The institute prospered to become an example for others in England and Europe, while in turn its management constantly sought information about developments on the continent.[172] In order to extend the curriculum, Paris engraver and plate printer Auguste Delâtre (see Fig. 82) was encouraged to set up an etching class in 1860.[173] The prominence of French art was further emphasised when Alphonse Legros was appointed professor for the etching course in 1863. He continued his teaching at the Slade School at University College from 1876 to 1894.[174] Plate printer Frederick Goulding assisted Legros from 1876 and became fully responsible in 1891. His most successful student, Frank Short, became his successor at the museum's school from 1891 to 1924.[175] It was during this period that Short also organised the didactic display of *Tools and Materials Used in Etching and Engraving* in the V&A from 1904, the first official exhibition of materials for intaglio printmaking.[176]

Rise of the artist-etcher
The separation of artistic from reproductive printmaking saw the rise of the 'artist-etcher', ie an artist who etched and printed his own plates. The aim of the Paris Société des Aqua-fortistes (1862–1867), founded and supported by the

publisher Alfred Cadart, was to fight (*combattre*) against photography, lifeless prints (*sans inspiration*) and the interpretation of a work of art by a machine. They did this by motivating artists to make etchings themselves and by creating an interest for handmade etchings with the general audience.[177] Three of its members published manuals on etching. Adolphe Potémont wrote, conceptually, about the technique in the form of an etched letter (1864) (Fig. 76); he also published a short manual in 1873.[178] Maxime Lalanne's *Traité de la gravure à l'eau-forte* (1866) became the movement's manifesto and the new foreword to the second edition described how successfully their ideas had taken root.[179] Delâtre published a manual in 1887.[180] The Société wanted to stimulate the interest of artists and the general public in 'manual' printmaking as opposed to the new photomechanical processes. Paris-based, with most members being French as well as some foreigners, they spread their ideas abroad. English members, among them Francis Seymour Haden, founded the similar Society of Painter-Etchers in England in 1880.[181]

The Koninklijke Academie in Amsterdam (est. 1820) became the Rijksacademie in 1870.[182] Female students were accepted from then on, something that had not previously been possible, an important step preceded only by the Royal College of Art in London.[183] In addition to engraving, etching was taught by Professor Johann Wilhelm Kaiser twice a week in the early 1880s. His teaching seems to have been progressive at the time, but his successor Rudolf Stang was not particularly happy with modern etching techniques and some students had to educate themselves in the process to which end they studied the manuals of Lalanne and Hamerton.[184] They then founded the Nederlandse Etsclub (1885–1896), which also accepted women.[185]

But did those nineteenth-century printmaking societies disseminate their technical knowledge as well as their idealistic agendas? Some of their members, such as Delâtre, Lalanne and Potémont, did publish on etching techniques, as did six members of the Society of Painter-Etchers.[186] But what about the establishment of any practical courses in printmaking? James Whistler, a member of the Société des Aqua-fortistes, received a basic training in etching during his short appointment at the United States Coastal and Geodetic Survey, training that served him well during his artistic career. His technical background would have stood him in good stead when advising those starting out in etching.[187] English etchers regularly published articles on etching techniques for their colleagues and amateurs alike, and art journals devoted columns to answering readers' questions on etching from the middle of the nineteenth century.[188] But a more systematic approach does not seem to have been adopted by the etching societies.

Practical courses may have come about from another direction. Paris had a system of private studios in which students gathered around established artists. The Atelier d'Art also offered correspondence etching courses around 1890. It was possible to send an etched plate to the atelier, which was printed and returned with corrections annotated.[189]

One of the more famous was the studio managed by the Englishman, Stanley William Hayter. Together with Joseph Hecht he founded a printmaking studio in Paris in 1927, named Atelier 17 from 1933, which was to become the cradle of modern printmaking. From 1940 to 1945, Hayter offered courses in printmaking in New York, establishing an independent 'Studio 17' there in 1945. His teaching of new technical processes, exhibitions of modern prints, and in particular his role as a liaison between established European artists and young American printmakers, effected a breakthrough in modern printmaking in the United States in this period.[190] Hayter published his ideas and working experiences in his influential *New Ways of Gravure* (1949), and many of his students themselves became teachers of printmaking, also publishing manuals on printmaking.[191] Hayter considered printmaking to be a 'medium of original expression' and he propagated this idea by means of a combination of technical training and Surrealist ideas.[192]

Printmaking becomes popular

Printmaking became popular among all social classes in the first decades of the twentieth century.[193] Courses in printmaking for children were offered in Germany in the 1920s and 1930s.[194] From the age of six, children drew with simple drypoint techniques – not with the intention of mimicking art but as a means of self-expression. Cardboard and compressed paper (*Preßspan*) were used as printing plates that were scratched with needles specially designed for the material. Printing was done on cheap presses or even by hand.[195] Intaglio printmaking courses were available in secondary schools from the 1970s onward, and are offered in studios and institutions for children and amateurs today; courses are also broadcast on radio and television.[196] A wide range of information has become available through the Internet in recent years.

Books and articles

The study of instructive texts to gain insight into historical developments of intaglio printmaking techniques is worthwhile up to a certain point. Authors of manuals tend to discuss ideal circumstances with less detail of actual workshop practices because it is not possible to delve deeply into every particular situation. For the student of historical printmaking techniques this means that he will come across practices never referred to in any treatise. When studying the prints of one engraver in particular, ways of working may be found that were not divulged in written sources. Most

workshop habits and everyday practice were rarely recorded. Nevertheless, the study of texts on printmaking does provide an overview and information about common technical processes and images of workshop interiors will reveal further details.

Most manuals on etching and engraving were compiled by professional engravers and printmakers writing from practical experience and aimed at informing the student, sometimes the amateur, but rarely their professional colleagues, as the introductions often make clear.[197] Articles in eighteenth-century journals tended to discuss recent developments, but later on they went into greater technical detail with the aim of informing professional engravers and plate printers. Articles on printmaking intended for amateur and professional artists appeared from the mid-nineteenth century.[198]

The aim of encyclopaedias was to give a general overview of the state of affairs; they were not intended as a means of learning the craft and were generally too expensive for the common craftsman or artist to be able to afford.[199] When items on craft and technique in eighteenth-century encyclopaedias do have an instructive character, this is usually due to compilers who based their descriptions on practical texts but without making a sharp distinction between descriptive and instructive concepts. For example, the articles related to etching and printing in Diderot & D'Alembert's *Encyclopédie* or in Krünitz's *Oeconomische Encyclopedie* both seem to be practical because the editors wished to elucidate printmaking processes, which they did by reworking excerpts from manuals.[200]

Illustrations and specimens

Until well into the nineteenth century, manuals on intaglio printmaking were illustrated mainly with etchings with fewer engravings. Occasionally the process described was illustrated with a sample plate or a figure made according to the prescriptions given, a so-called 'specimen'. Bosse (1645) described the making of, and illustrated his treatise with, etchings. He was especially interested in using the *échoppe* (see Fig. 179, p. 199), an etching needle with an obliquely cut tip suitable for drawing lines that looked like engraved lines, and he used the *échoppe* for most plates in his manual.[201] He demonstrated several other ways of etching lines of different widths in plate 8 (Fig. 77).[202]

True specimens, ie illustrations and strips of samples made expressly with the intention of showing the effects that could be achieved using particular tools or techniques, are found regularly in nineteenth-century manuals (see Fig. 15, p. 17 and Fig. 16, p. 18). Illustrations using photomechanical techniques appeared in manuals shortly before 1900. On the one hand they allowed for the reproduction of original prints and on the other authors could produce original etchings that were bound with their books, a practice that continued until the 1930s.[203] From then on manuals were illustrated with reproductions of specimens and prints only.

The clearer the illustration the more informative it is. The first photographic illustrations of intaglio printshops appeared in journals and reference works from the 1890s.[204] Manuals with detailed (reproduced) photographs of tools, materials and presses were not published before 1930.[205] More effective in explaining printmaking methods are presentations by moving images, ie film, video, DVD and the Internet.[206] There is still no better way of illustrating the results of a technique, however, than showing specimens and original prints, a convention common in the modern printing industry.[207] For manual graphic processes the drawback is that it takes a lot of time to produce originals, which makes publication expensive and consequently edition numbers are low. Nevertheless some modern examples of this practice can be found.[208]

Discussion

The teaching of etching and plate printing became standard in practical art education in the twentieth century, with its own facilities and regular study hours until in one seemingly worldwide sweeping movement printmaking courses were reduced to a few months or even completely removed from the curricula and studios closed. All of this happened in western European countries, Australia and North America in a relatively short period starting in the early 1990s.[209] Cries for help were posted on Internet discussion lists, studio space was sacrificed to canteens (sharing this fate with libraries), and professors were dismissed with training left to technical assistants.

The discontinuation of printmaking courses and the closure of facilities was due to a variety of reasons. Economic issues, changes in attitude towards art education in general and printmaking in particular (the presumption that concept is superior to technique), health and safety aspects, decreasing numbers of students, a burgeoning interest in digital techniques, malevolent managers and lack of subventions: all are mentioned and all are relevant to a greater or lesser extent.

The first signs of a revival of interest in printmaking appeared in 2007, but there is the problem of the interruption of traditions – several generations of students have missed out on the transmission of technical knowledge and artistic concepts in printmaking built up over a century. Theoretically it should pave the way for younger artists to develop unhampered by these same traditions, if printmaking still holds sufficient appeal for them.

The Workshop

Manuals on printmaking describe materials, tools, machines and techniques used in the craft. Often missing, however, is a description or design of the place where it all happens – the studio. Up to more than a century after the first engravings were printed it was still unclear as to what printmaking workshops actually looked like. Then, gradually, information started to trickle in, the majority of the material being derived from visual sources.[210]

When concentrating on a particular workshop, a researcher is keen to find out about its working conditions, as well as about spatial, economic and social contexts. The working conditions may provide ideas as to under what circumstances engravers and plate printers worked: the size and furnishings of the studio, on which floor it was situated, lighting and heating conditions, as well as about working clothes. Information on the spatial context could answer questions about the position of the workshop and its locality: other engravers and plate printers in the neighbourhood, the presence of suppliers, communication facilities (post office, Internet café), transportation possibilities and trade routes. The economic context could refer to craft organisations (the guilds, mentioned above), customers, dealers, publishers, commissions, the numbers in which editions were printed, the quantities of finished prints kept in stock, and the trade in printing plates. The social context could reveal relationships between the workers in the shop or of the workers with their surroundings, contacts with other printmakers (often family ties), of political and religious aspects, sustaining and further opening up of business opportunities. All four issues are interconnected, and they influence each other as well as the appearance of the prints produced.

This discussion focuses on the material aspects of the workshops of the engraver, the plate printer and, from the nineteenth century, the artist-etcher. What was the layout and size of the room? What about furnishings, and heating and lighting conditions?

The engraver's workshop

The earliest engraver's workshop would have been a modest room, with a table and a stool, windows for light, sharing limited space with other craftsmen in a specific area of town. During the early period specialisation was not a realistic prospect, so after its invention in the 1460s, a press would have entered the workshop in the last decades of the fifteenth century. Most engravers would have worked at home and the more accurate depictions of interiors from later centuries show a common room. The furnishings are modest, with a large table, a chair and the tools needed, with some plates standing around. Perrot, for example, informs us that the table should be 2 × 1.35 m, made of oak and thick enough. However, there is no mention about how high the table should be or of the chair needed.

Lighting conditions

Lighting conditions are decisive in the selection of a suitable room.[211] One large window would have been preferred to several windows providing light from different directions.[212] Artificial light became generally available only in the twentieth century and consequently most historic studio interiors show engravers sitting underneath a window – few work with the window to their left or right.[213] The Florentine engraver Domenico Tempesti, who studied in Paris in 1677–1680, noted that the morning was the best time to work – there was too much light in the afternoon. His master Robert Nanteuil regarded northern light and skies with white clouds as creating the ideal lighting conditions.[214]

Windows filled not with glass but with oiled parchment, paper or linen, were known from the Middle Ages.[215] In a Mediterranean climate there is less need for glass windows – daylight is abundant and the shutters can be closed against rain. Perhaps such a situation is depicted in Zonca's interior of an Italian printshop of 1607 (see Fig. 225, p. 284). Most other images of studio interiors have a northern background, are made after 1600 and they all show windows fitted with glass (Fig. 78).

Filtered and diffused light makes it easier to judge the work and protects the engraver's eyes as there is less reflection from the polished copper plate. Richard Symonds noted in the diary of his Italian travels (1649–1651) how to make a *Fenestre da Pittore* – thus for the painter and not for the engraver – from sheets of 'fine french paper' pasted together. The paper is impregnated with 'hogs greese melted & layd on hott', which kept the paper 'white and lucid', while oil would turn it yellow.[216] Symonds does not mention it, but presumably his paper screen was just placed vertically inside or against the window frame.[217]

Such a blind is absent in Bosse's *Graueurs en taille douce au Burin et a Leau forte* (1643), but a screen is standing behind the etcher sitting on the left (see Fig. 67). This object is not described in any source. The light in the room comes from the right and the engraver sitting on that side lifts one end of his plate to handle it. The etcher's window does not let in much light and the function of the screen seems therefore to reflect the incoming light back to the etcher's desk (apart from giving Bosse the opportunity to show off his skill in drawing perspective).[218]

We find sashes for the engraver hung perpendicularly from the top of the window frame in the 1690s. Gilles Filleau

des Billettes (1693) explained that the engraver's working area should be provided with such a screen and illustrates this in the adjoining plate (Fig. 79).[219] In Luyken's *Plaatsnyder* (1694) and in later workshop interiors, the engraver invariably sits at a desk in front of a window with a slanted sash (*bladvituur, blaffeture, Blendrahmen, blind, chassis*) between his work and the window from then on (Fig. 80).[220] The light is further controlled by covering all other windows of the room with curtains.[221] Occasionally a hand device is used to diminish the shine of the polished copper locally (Fig. 81).

At night engraving could be performed by lamplight and a blind could be placed between the lamp and the plate (Figs 81 and 82).[222] Special devices for engraving by lamplight using one or more candles with a small screen to diffuse the light are documented from the late seventeenth century. Filleau des Billettes remarked that this screen could also be used during the day.[223] Samuel Pepys, in his diary for 1664, referred to 'a Globe of glasse and a frame of oyled paper' used in engraving copper objects.[224] Engravers in copper as well as in wood placed glass balls or spheres, filled with water, between the light source and plate or block to concentrate the light on the work (Fig. 83).[225] The globe projected the light on the work; more globes positioned around one light source could serve more engravers.[226]

Gaslight was used throughout the nineteenth century but its drawbacks were that it caused an unacceptable rise in temperature and unpleasant fumes from the sulphur it contained.[227] Electric lighting became available in the 1870s and seemed promising for studios but was not installed at that time.[228] According to Paton (1895), the best lighting conditions are those attained by using gas or oil lamps.[229] Electric light was not used in the studio until the 1920s.[230]

Heating conditions and clothing

Some interior depictions include a stove or hearth for heating (see also Figs 70, 89 and 93),[231] but generally authors do not pay specific attention to heating, probably regarding it as a given. The stove used by the etcher for melting the ground onto the plate would have provided some warmth when in use.[232]

No particular protective clothing was needed for the job and engravers are always depicted dressed casually. They wear long sleeves and Bosse therefore recommended that the buttons on the sleeves of etchers' coats should be sewn at the side to prevent the buttons from scratching and damaging the etching ground.[233]

An item that appears only in the nineteenth century is some form of eye shade worn by the engraver to prevent strong light shining directly into his eyes, allowing him to better observe details when engraving or drawing the plate.[234]

Working desk

Fokke (1796) gives some early ergonomic advice. He suggested cutting out a semicircle to make space for the engraver's body, instead of wedging his belly against the edge of the desktop with disastrous effects 'for the proper streaming of the body fluids'.[235] The plate to be engraved could lay flat on the desk, but was usually kept in the other (left) hand or rested on a support, and tools were kept within reach.[236]

The etcher laid his plate on a table with his tools, a bottle of acid, and sometimes a bowl or bucket of water on the floor (see Figs 67 and 79).[237] Some seventeenth-century illustrations show etchers working on a slanting desk (see Fig. 67).[238] Bosse described how the etching plate could be placed on a small easel (*cheualet*) for drawing, reminding readers that Callot worked that way.[239] Such supports are absent in eighteenth-century documents until Longhi published his design for a slanting desk with a revolving tabletop.[240] The idea was well received because ergonomically it allowed for better positioning of the body during work.[241]

Commonly the design or print to be copied is present or there is a working proof in front of the engraver. This is what is represented by the sheet with *Incisoria* in Cort's engraving of *The Practice of the Visual Arts* (1578) (see Fig. 75).[242] The earliest example of a drawing or print to be copied being supported on a stand can be observed on Stradanus's drawing of an engraver's workshop (Fig. 84).[243] More appear afterwards regularly (see Figs 67 and 82; see also Fig. 148, p. 169).[244] Paintings supported on stands for reproduction appear from the late seventeenth century on (see Fig. 79).

The plate printer's workshop

The oldest known reference to a roller press for intaglio printing is found in an Antwerp Act of 4 September 1540.[245] Only the press is mentioned so nothing can be concluded about the arrangement of the printshop. Four years later, the inventory of the Antwerp printmaker Cornelis Bos, who cut in wood and engraved in copper, records that his plates, woodblocks and paper were found at various places in the house, while the presses were located in the attic.[246] Pieter Bailly, bedel at Leyden University, printed copper plates for the Raphelengen publishers in his attic as a secondary job from 1595.[247] Other sixteenth-century references mention that printing was done in the home, but details are not given.[248]

The second edition of Johannes Sambucus's *Emblemata* (1566) contains an emblem for typographic printing with

what seems to be the earliest representation of an intaglio printshop (see Fig. 227, p. 288).[249] The apparatus placed against the back wall, according to its construction, is certainly not a typographic press, but looks like a roller press with a six-armed cross. This together with the other elements in the image provides a good idea of the interior of a contemporaneous plate printshop. A thin (metal) plate is lying on the bench to the left of the press, with two printing balls on top of it. Parcels of paper or printed sheets are on the far left. The machine and the bench are located underneath a blank space, presumably representing a window.

Workshop layout
The first more realistic image is Stradanus's illustration of the interior of a printshop (c.1591) (see Fig. 64). The room is spacious with a freestanding press and a workbench for inking and wiping. A second press is visible in the backroom where the ink is also ground. Several workmen, an engraver, apprentices and visitors can be seen. The print is a composition of naturalistic elements depicted after actual working practices.[250]

A printshop was built inside Jacques Callot's apartment in the ducal palace in Florence in 1619. The shop was furnished with 400 tiles, giving a working floor space for the printer and his two assistants of approximately 12–15 square metres. There were nails with hooks and hemp ropes, probably used for hanging the prints to dry. The cupboards had extra shelves and the door could be locked securely.[251]

Tempesti (1680) describes the press, with tables at both ends, as standing in the middle of the room with the working bench positioned underneath the window.[252] After a plate had been printed, the impression was laid on the nearby table, as previously explained by Bosse. This is perhaps Tempesti's source for his remark as he referred the reader to Bosse's treatise for further details.[253] In the depictions of printshops by Kilian, Merian and Bosse himself just one such table with freshly printed proofs can be seen (see Fig. 11, p. 12; see also Figs 68 and 78).

Bosse's printshop interior of 1643 may be seen as a model for his contemporaries and following generations as so many copies have survived to this day (see Fig. 68).[254] The press stands prominently in the middle of the room. The men, all three standing, are involved in the main actions of a printshop: inking (in the background), wiping (front left) and printing (in the middle). The plate is inked on an iron grid with a stove with live charcoal underneath. The ink is taken from a small bowl and rubbed into the crevices of the plate by means of a tightly rolled strip of linen, a 'dabber' or *tampon*. Rags are used in wiping and the final touch is provided by hand. The man turning the cross of the press is depicted pulling with both hands and pushing with one foot. Turning by hand and feet was necessary when resistance in running a plate through the press was strong, but it is also a dramatic pose favoured in many similar presentations up to the present.[255]

Printing ink stains are difficult to remove and printers therefore wore aprons. Workers can be seen either wearing long sleeves or with their sleeves rolled up; both are sometimes visible in one image. The printers have rags hanging from their waists for cleaning their hands during work.[256] The apron, rolled-up sleeves or short-sleeved shirts and the rag are commonly found through the centuries (Fig. 85).[257]

Lighting conditions
Lighting was by means of daylight only from the first depictions in the sixteenth century until recently. Glass roofs are an improvement from the late nineteenth century (Fig. 86).[258] The kind of slanting sashes used by engravers since the 1690s appear in printshop interiors only in the nineteenth century, diffusing the light shining on the plates while they are being wiped (Figs 85, 87 and 88).[259] An early exception is visible in the Van der Venne interior of a book and plate printshop of 1623 (see Fig. 73). Here we see a room with large windows adjacent to each other; on a sunny day the room would have been flooded with light. About half of the windows are therefore covered with a kind of vellum, probably linen cloth stretched over the inside of the window. A slightly peculiar feature is the window above the plate printer's workbench, on the right of which only the lower part is covered. This resembles the sash used in the nineteenth century, but is not found in other sources from before that time.

The London firm of Ackermann had gaslight installed in the printshop in 1812. Artificial lighting became even more of a necessity when the business moved to the newly designed premises in 1827 and the printshop was installed in the basement.[260] Gas or oil lighting can be seen in interiors from the 1890s to the 1920s (Fig. 88).[261] Electric lamps appear in printshops in the 1920s (Fig. 89).[262] Lighting conditions changed drastically with the large-scale introduction of fluorescent tubes in the 1970s that lit rooms sufficiently to be able to move the wiping bench away from underneath the window.

Heating conditions
A stove or hearth for heating the room would have been present (Fig. 88) but was rarely documented.[263] It can perhaps be identified in the far right corner of the painting of Jan Pieters. van der Venne's printshop in Middelburg from 1623 (see Fig. 73). The basin with live charcoal, above which the plate was inked, functioned as a modest heat source – at least for warming the hands of the workmen.[264]

Gas lighting was installed in London workshops from about 1810 and the opportunity was also taken to use the

gas for heating the plates during inking.[265] Ramshaw's patent of 1819 describes centrally heating the stoves and the drying room by means of steam. He had a printshop with thirteen hotplates that may have given off enough warmth to heat the rest of the room (Fig. 90).[266] While the heat emanating from a stove with glowing charcoal could be controlled by covering the live coals with ashes, the fumes given off were rather noxious for the workmen. Heating a stove by steam was therefore recommended by Ramshaw who argued 'that injury to the health of those employed is thus prevented, as every person must be convinced of the unhealthy state of rooms where charcoal is burning in open pots, without flues, from which both noxious fumes and particles of fine dust are continually escaping'.[267] Connected to a stove heated by steam is a copper box filled with hot water. The water is maintained at the right temperature by an alcohol burner underneath.[268]

The gas stove replaced the charcoal brazier in the second half of the nineteenth century. It was cheap, and did not produce ashes or a foul smell. Gas gave a constant and even flow of heat, which could be regulated instantly,[269] but the naked flames and the fumes it produced were distinct disadvantages. These drawbacks were overcome when in its turn the gas stove was replaced by the electric hotplate around 1900.[270] The use in printshops of electric stoves gradually increased during the course of the century to the point where hotplates heated by gas became uncommon in the 1990s.[271]

Furnishings
A pile of damp paper is usually seen on top of the press, prepared the day before and ready for use.[272] Common elements found in printshops are the ropes, rarely laths, over which the impressions are hung, from the ceiling, to dry the paper and the ink (Fig. 91).[273] The cords run along the wall in some printshop interiors (see Fig. 225, p. 284 and Fig. 263, p. 324). Smaller sheets or more precious works were left to dry on a table (see Fig. 78).[274]

Further elements commonly present are dabbers, cloths for wiping, a basket or barrel for waste paper, plates leaning against the wall or on shelves, and a jug of beer or wine (see Fig. 64 underneath the press, Fig. 68 on the left on the windowsill, Fig. 73 on the left on the stand; see also Fig. 225, p. 284, the can without a number on the right of the press, and Fig. 246, p. 302, in the lower right).[275] Proofs are stuck to the walls and the press, rejected prints lie about on the floor, and parcels of prints are waiting to be despatched. The curious visitor – people at work always attract attention – and the client are common phenomena in studios. They can be recognised by their neat or fashionable dress as compared to the workmen in their casual clothes with rolled-up sleeves (see Figs 64, 67 and 73). Dogs are seen occasionally too (see Figs 73 and 78).

Plate and relief printing combined
On several occasions we find both plate and relief printing performed under one roof. The 1544 inventory of Cornelis Bos, already mentioned, probably lists a press for printing woodcuts and one for intaglio printing. The 1596 inventory of the Roman publisher of engravings and woodcuts, Altiero Gatti, lists two presses – again probably one for relief and one for intaglio printing.[276] Book and plate printing were combined in the Van der Venne workshop that flourished in Middelburg from 1620 to 1625 (see Figs 65 and 73). The typographic press with its two printers is prominent in the foreground surrounded by the other activities involved in the book printing trade, while in the background on the right the roller press is being operated. Intaglio printing is carried out by only one person – this is uncommon as usually two or more workers would have operated a roller press.[277]

The printmaker's workshop

When Adam von Bartsch introduced the term *peintre-graveur* by the end of the eighteenth century it was no longer considered the norm for the engraver to print his own plates. However, developments towards the proofing of plates by artist-etchers, as advocated in the second half of the nineteenth century, were already taking place.[278]

Artist-etchers
The change from the engraver having his plates printed towards the artist-etcher printing his own plates took shape between 1850 and 1870. As already discussed, one major influence was the presentation of the patent of the daguerreotype on 19 August 1839, and the revolutionary development of photography and photomechanical printmaking techniques in combination with the mechanisation of printing that followed after. As a consequence artists turned to manual techniques and artistic printmaking became separated from the printing trade.[279]

A freer spirit in handling the etching needle appears in the works by Eugène Delacroix from the second decade of the nineteenth century.[280] More French etchers followed this revival, but even such a prolific etcher as Charles Jacque still had his plates printed by a professional plate printer.[281] The first steps towards the artist-etcher proofing his plates became apparent in the mid-nineteenth century. The Haagsche Etsclub (1848–1862), a small group of painters in The Hague, met up weekly to dedicate Friday evenings to the study of etching (Fig. 92). Joseph Hartogensis, who

had a press in his studio and probably printed for the others, joined the group in 1849.[282] Across the North Sea, Englishman John Burnett, writing for *The Art-Journal* in that same year, advised amateur etchers living in the countryside to acquire a small, inexpensive press.[283]

These etchers did not agitate against the printing trade, but they were forerunners to the Etching Revival that started in the 1860s. The establishment of the Société des Aqua-fortistes by Alfred Cadart in Paris in 1862 was a natural move by an enterprising man who kept a close watch on the developments of his time. The following year Mr Luquet became his business partner and in a progressive move, Cadart facilitated an open printmaking studio with an etching press next to his shop at 74 Rue de Richelieu.[284] Artists probably did not print themselves there, but had their plates printed.[285] Nevertheless, etching and printing were organised under one roof. Lalanne, in his manual of 1866, did not advocate that the etcher should print his own plates; instead he gave the necessary details of the equipment and techniques required for intaglio printing.[286]

Do it yourself

Hamerton (1866) went a step further, emphasising that 'every one who etches ought to have a press in his own house'.[287] At that time he was occupied designing a small roller press and the first model was offered for sale by the firm of Roberson in 1870.[288] Outdoor drawing of etching plates had been practised before by etchers who carried some already-grounded copper plates and a needle with which to sketch on them. Printmakers of this period engaged more actively by also carrying stopping-out varnish and acids to etch their plates at the spot where they were drawn.[289] Hamerton's press took outdoor etching to a higher level – because it was small enough to be taken on trips, the plates could also be printed while away.[290]

The etching clubs set up following the establishment of the Société des Aqua-fortistes looked at their predecessors (especially Rembrandt) and decided that in order to produce art as great as their protagonists, they should work in the 'old manner'.[291] Printing one's own plates fitted this point of view and it gradually became accepted, if not a necessity, that an etcher should have a press in his studio. As a consequence, etching manuals from then on contained directions for printing, including the preparation of ink.[292] Suppliers of etching materials started selling the necessary equipment and materials for plate printing.[293] The new manuals gave descriptions and provided plans for the arrangement of the studio.[294] They contained recommendations for, and lists of, addresses of suppliers of printmaking materials and press manufacturers. The printing of editions was usually left to professional plate printers, whose addresses were also given.[295]

For Paton (1895) printing was 'part of the artistic process'. To him it was only natural that the etcher should print his own plates and later authors continued this theme.[296] Plowman (1924) emphasised that 'the beginner should possess a press and do his own printing as soon as possible'.[297] The new concept expressed itself in the furnishing of the 'printmaker's studio', in which the artist both created and printed his plates. Evolution can be seen in plans by Paton (1895) and by Lumsden (1924), who carried out all the processes in one room (Figs 93 and 94). A few decades later Hayter (1949) divided the different printmaking activities between two rooms (Fig. 95).

By the twentieth century, all kinds of suggestions were offered for making one's own grounds, tools, inks, presses and paper,[298] all of which influenced the arrangement of the individual artist's studio as well as stimulated the appearance of larger printmaking studios with plate making and printing facilities (Fig. 96).[299] These studios were built in such a way that the student or artist could practise the complete printmaking process himself – in the last three decades of the twentieth century some contemporary studios even included papermaking departments.[300]

Discussion

By the beginning of the twentieth century there was a dichotomy between the idealism of etching clubs that advocated that the artist-etcher should print his own plates and the average working practices of other artists trying their hands at etching. The printing of editions was left to professional printers and art academies did not offer training for students in intaglio printing. The new roller press of the Rijksacademie in Amsterdam, for example, was installed in 1908, the printing being carried out by the staff (Fig. 97). The number of students who proofed their own plates would have been modest in the 1930s and it was still not common for etchers to print their own plates in the 1940s.[301]

Printing finally became part of the curriculum at art academies in the 1960s with major consequences for private and public printmaking studios. Etching and printing facilities were created, with hotplates and professional presses, and with fume cupboards and exhausts operating continuously to remove the vapours of acids and solvents. Greater consideration of health and safety issues stimulated a demand for less or non-volatile grounds, solvents and acids. The application of these new materials created new challenges for printmakers, which as a result also influenced the aesthetics of the print.[302]

Suppliers

Had it not been for the suppliers of raw and semi-processed materials, the smiths who forged the tools, the planishers who prepared the copper plates, the ink makers, the papermakers and the press manufacturers, the engraver would have had a hectic time preparing everything himself.[303] Plate printers had been burning their oil varnishes themselves for centuries, but the pigments for the inks were imported and carpenters and joiners manufactured presses locally. Society is organised in such a way that one person or a conglomerate prepares materials for another and eventually the system as a whole brings forward the final product, in our case a print. This fact, however, is not well recognised – all too often the print, the image alone even, is considered simply on its own merits with everything else taken for granted, with a total disregard of the print's social and material context.[304]

Dealers in artists' materials

Because so many students and artists, and many more amateurs, started etching in the nineteenth century, suppliers' businesses prospered up to the present level of dealers specialised in printmaking materials and manufacturers of roller presses. Initially copper plates were bought from coppersmiths, salts and resins from grocers or pharmacies, tools were supplied by hardware stores and blacksmiths, paper as well as oils and black pigments seem to have been sold wholesale, and presses were constructed by joiners. Manuals of the past two centuries regularly informed their readers about where to buy their materials. Suppliers occasionally advertised in these manuals and separate catalogues for artists' materials were issued in the nineteenth and twentieth centuries. Since the late twentieth century, suppliers have offered materials through their websites.

Names and addresses of suppliers are found occasionally even before 1800.[305] Amateurs could acquire etching supplies from professional engravers. For example, at the end of his Dutch translation of Bosse's treatise, Pieter Holsteyn II informed readers that all materials mentioned were prepared by and could be bought from him.[306] Some later authors also offered their services.[307] Starting with Bowles's manual (c.1760), published by the engraver and printseller T. Kitchin, who also supplied etching materials, publications appeared written by authors on behalf of or sponsored by a company. Manuals contained addresses of their sponsors and product catalogues were bound in with the manuals.[308]

Advertisements and catalogues
The London engraver Matthew Darly (1776) also dealt in art materials. He issued a broadside recommending his shop in which, among many other items on offer, are 'Copper Plates prepared for Ladies and Gentlemans Etching, Engraving, Metzotinto, with all sorts of Materials for Do. Viz. Fine Etching Ground, Needles, Gravers, Scrapers.'[309] English suppliers that followed produced catalogues offering printmaking materials, mainly for etching; suppliers on the continent issued catalogues a little later.[310] The increasing number of amateur etchers probably stimulated this growth of suppliers of printmaking materials.[311] The shop of Ackermann was perhaps the first to publish a catalogue (c.1840) of artists' supplies with a (short) list of the etching materials they stocked (Fig. 98).[312] Earlier catalogues contained materials for etching only, while Roberson was the first (c.1870) to also offer materials for plate printing, such as ink, paper and small presses (Fig. 99).[313] Specially designed advertisements for etching and printing materials are found in books and magazines at the start of the twentieth century (Fig. 100).[314] This suggests that such advertisements may have been around a decade earlier.

Etchers and engravers in nineteenth-century London and Paris were well provided for by specialist shops and outlets supplying printmaking materials. The situation in the United States was markedly different, as described by John Chapman (1870): 'Any country blacksmith, from an old file, can shape a graver, and temper it rightly too; possibly not as well as Fenn of London, or Renard of Paris, yet still to serve. Even for copper plates, upon an emergency, there is scarcely a village in our land where they could not be prepared, to meet the requirement of a determined will to have them.'[315] Compare this with the abovementioned catalogue from the London firm of Roberson of the same year, which offered literally everything that could possibly be needed for engraving, etching and printing, including a press.[316]

But the situation in America did improve – the 1880 English (or rather American) translation of Lalanne's treatise sums up the utensils needed and informs readers where they can be procured and at what prices in the United States.[317] This method of providing information became standard and throughout the twentieth century most manuals included a list of suppliers' addresses. The first of its kind supplements Preissig's text (1908), with addresses of shops in Germany, Czechia (Czech Republic), the United Kingdom, Italy and France supplying plates, grounds, tools, paper, ink and presses.[318] Plowman's manual (1914) includes a list of suppliers in the United States, United Kingdom and France.[319]

Materials suppliers

The following paragraph sketches where printmaking materials could be acquired. Special attention is given to press manufacturers, however, because the machine plays such a pivotal role in the printmaking process. The emphasis is on pre-1960 suppliers and manufacturers. The flourishing of artists' materials shops in the nineteenth century was followed by a series of mergers in the twentieth century and from the 1960s a worldwide network of art supplies stores and press manufacturers was established due to the increased demand for fine prints.[320] Nowadays a print-maker can buy practically anything he needs from specialist suppliers of artists' materials who offer a wide range of products.

The costs of materials and tools are a difficult subject, and only scant attention is paid to it here. Prices are directly associated with a particular place and time, and are liable to change due to inflation and other influences.[321] Comparing historic prices and monetary values with those of today is not very helpful either as the differences are too great – both in financial values, currency differences and the kinds of materials supplied. Possibly the best way to relate costs for the making of a print is to link them to the income of the engraver or printer but this is beyond the scope of the present study. Where possible, comparison is made with similar products to give an idea of values.

Plates
Copper plates were bought cut to size at the coppersmith's and, from the nineteenth century, also ready-prepared from suppliers of artists' materials. Plumbers or hardware stores were regular sources for copper and zinc plates from the nineteenth century on.[322]

Planishing the copper was time-consuming therefore engravers were happy to leave this job to others or buy the plates ready prepared.[323] Coppersmiths supplied polished copper plates in Antwerp in the sixteenth century and in Paris and London in the seventeenth century (Fig. 101).[324] Plates ready for engraving and etching were still supplied by coppersmiths in London at the end of the eighteenth century,[325] by which time they had settled around Soho, according to their marks on the reverse of the copper plates (Fig. 102).[326] Coppersmiths specialised in the supply of ready-prepared plates are also found in other cities in the UK (Manchester) and Germany (Berlin).[327]

If there was sufficient demand in the seventeenth or eighteenth century, the engraver could have his copper planished by a local specialist.[328] Manuals occasionally refer to planishers.[329] Copper and steel plates, cut to size, faceted and polished were available to the engraver from specialist dealers in larger cities in the nineteenth century.[330] The etcher could even buy ready-prepared 'copper and steel plates, with the etching ground already laid on them'.[331]

Rocking a mezzotint plate (creating a dense criss-cross pattern on the surface) is a tedious job and from the few references available it is apparent that there was some trade in pre-rocked mezzotint plates. They were on sale in Amsterdam and Rotterdam in the eighteenth century, or could be ordered from London.[332] Workmen specialised in rocking copper plates by hand were active in London in the nineteenth century; they charged 4d per square inch by 1900.[333] It is possible that machine-rocked steel plates were available in the nineteenth century – because the material is so hard it is likely to have been available as a commercial product rather having been prepared in the engraver's studio.[334] The Munich firm of Sedlmayr seemed to be still selling rocked copper plates in the early twentieth century.[335] Rocked aluminium and copper plates are produced in Japan today.[336]

From 1584 it became compulsory for Antwerp coppersmiths to hammer a mark in their wares and from 1600 on they were required to add the year of manufacture.[337] Such marks are also known from other towns, the rule extending to nineteenth-century steel plates (Fig. 103) and early twentieth-century zinc plates (Fig. 104).[338] The names of plate producers together with further information were stamped with ink on the plates from about 1970 onwards.[339]

The buying and selling of copper plates was an international business as shown by the following examples. Prepared plates were imported into England from Holland in the seventeenth century.[340] The French, who engraved the *Victories* of the Chinese emperor Qianlong in the period 1767–1773, ordered the copper plates for the project from England.[341] Printing plates were imported into Amsterdam from Germany in 1779.[342] Sellers & Co. of Sheffield, suppliers of copper and steel plates of 'extraordinary quality', shipped to the continent and the United States in the nineteenth century.[343] Dutch etcher Carel Dake ordered plates from Paris in 1894.[344]

A special case is Nicholas Power who did not export his plates but moved abroad himself. After having worked in the production of steel printing plates in London for twenty-seven years, Power moved to Karlsruhe (Germany) to establish a factory for the production of polished copper and steel printing plates. Steel plates were sold at 3 *Kreuzer* per square inch and copper plates at 1 *Florin*, 48 *Kreuzer* per pound.[345]

Prices are related to the weight of a plate and whether or not it is planished, both in the past and nowadays.[346] The cost of a pound of unprepared copper almost doubled from eight *stuijvers* to fifteen *stuijvers* per pound in Antwerp from the 1560s to the late 1590s.[347] The price of copper increased by 60 percent in England in a period of ten years from 1789 to 1799. It was 1s 1d per pound in 1799 but rose to 3s per pound around the middle of the nineteenth century; steel plates cost double that price.[348] By the end of the nineteenth century the price of copper was 3s 6d per

pound; the smallest plates cost 1d per square inch.[349] Costs for polishing depended on the weight of the copper plate.[350]

With the growing popularity of steel plates they were supplied cut to size and polished. The earliest successful developments in steel engraving took place in France, where a Mr Schey, 5 rue des Petites-Écuries, Paris, supplied softened and polished plates in 1808.[351] Steel engraving only took off following the English invention of making thin steel plates suitable for engraving in 1818.[352] Prepared steel plates were five times as expensive as copper ones in 1844: a small copper plate cost 6d as against 2s 6d for a similar sized steel plate.[353] The difference was probably due to the softening process and the fact that steel, being harder than copper, took more time to polish.

Zinc plates were used occasionally for etching from the early nineteenth century onwards. The metal only became popular with printmakers in the second half of the twentieth century because it was cheaper than copper and easier to work.[354] Edmund Turrell (1817) mentions zinc from Knight's in Foster Lane, Cheapside, London – not as an etching plate, but as a cover for a drawing board he had designed.[355] Knight was, however, also active as a supplier of engravers' tools, so perhaps he had a hardware store where engravers could buy their materials.[356]

Transfer and transparent paper

In many cases, the engraver worked from a preliminary sketch or design.[357] Several methods can be used to transfer these to the plate, some of which require the use of transfer paper, transparent paper or a sheet of gelatin. Transfer paper has one side covered with a coloured layer that offsets easily onto another surface when drawn on the blank side. Transparent paper was paper impregnated with a clear liquid, such as oil or turpentine, or treated with sulphuric acid, to create transparency; currently a short-fibred, strongly sized paper is used.

Cennini remarks on 'ready-made' transparent parchment for tracing[358] but gives no further details, which leaves open the question as to whether the transparent parchment was for sale from a supplier or if it was made within a studio. Transparent paper was produced commercially in Nürnberg and Augsburg at the end of the eighteenth century.[359] Tracing and transfer papers, as well as gelatin sheets, were offered in catalogues for artists' materials from the nineteenth century on. They are usually found together with drawing materials or sundry articles because they are not explicitly intended for printmaking.[360]

Tools

The tools used by copper engravers are similar to those used by other metalworkers.[361] John Bate (1634) explained to his readers how to make and prepare a burin in much the same way as described by Theophilus five centuries earlier.[362] From Alexander Browne's advice (1660) to 'get some good French Gravers' can be gleaned that there was already a thriving international trade in engraving tools later in the seventeenth century.[363] Burins could 'be had at the White Lion and Key in Foster-Lane', London, around 1760, according to Bowles.[364] Eighty years later they were still being sold in Foster Lane, this time at Knight's.[365] Their burins cost between 3d and 6d, plus another penny for the handle. A burnisher cost 1s, a scraper 3s 6d, an etching needle 6d, and leather cushions around 1s.

Burins were probably made in England by the eighteenth century – Mattheus Verheijden (1736) notes that English burins can be bought in The Hague.[366] According to German author Friedrich Netto (1815), the best gravers were the English ones produced by Ward, followed by the burins manufactured in Lyon (France).[367] Proper engraving tools could be found in the larger east coast cities of the USA in the later nineteenth century.[368] By that time Josef Roller also found that tools from Munich were preferred in Germany and Austria.[369] Production of engraving tools continued into the twentieth century when Kenneth Steel observed that 'good quality gravers are made by many English manufacturers, but the French and the Swiss seem to be the specialists in this business'.[370]

Manufacturing a mezzotint rocker requires a specialised toolmaker because of the particular design of the blade. Rockers are the most expensive items in Ackermann's catalogue (1841) at 5s to 40s.[371] Sellers & Co. of Sheffield also produced rockers in the 1890s, tools that were considered the best of their kind. They cost 10s to 10s 6d per inch (width of the blade), which was expensive.[372] Nowadays the largest mezzotint rockers from the firm of Lyons (New York) cost up to a few hundred dollars.[373]

Manufacturing roulettes for crayon engraving was a French specialisation. Johann Meynier (1804) published a detailed letter on the subject sent to him from Paris, where these tools were sold in a shop called La Flotte d'Angleterre opposite the royal palace at 20 to 30 sous a piece.[374] The Dutch engraver Hendrik Schwegman (1806) confirmed that good roulettes could only be bought in Paris.[375]

Etching needles are needles set in a wooden handle, something that could easily be performed by any person with a little skill.[376] Around 1800 they could be procured ready made, according to Green: 'The etching needles may be had at most of the Hardware shops in London, as may all the tools used in Engraving, though there are men particularly famous for Engravers tools, as Hoole, 69, Oxford Street, &c.'[377] Needles of more sophisticated designs, crafted out of a single piece of steel, appeared in the nineteenth century.[378]

The plates were heated above a charcoal basin to melt the etching ground or resin for aquatint, as can be seen in workshop interiors. Not much heat is required and a simple alcohol burner will suffice, as was supplied by Roberson

(1870). This burner could be bought at 'druggists' in the United States in the nineteenth century.[379] Information does not seem to be available on the production and supply of gas heaters. Modern electric hotplates are usually produced by press manufacturers.[380]

Etching grounds

The many recipes for etching grounds and stopping-out varnishes documented through the ages would have been prepared by the etchers themselves up to the nineteenth century; only occasionally is there a reference to a supplier of grounds. In the case of Holsteyn (1662), he is addressing amateurs who can buy materials from him. His professional colleagues had their own preferred recipes, as shown by the list of recipes at the end of his translation of Bosse's manual.[381] The ingredients – wax, resin, asphaltum, tallow, turpentine and vegetable oil – were all commodities available at any grocer or pharmacy. Wax was also used for candles and could be purchased from the 'wax-chandlers'.[382] An eighteenth-century English source for ready-prepared grounds was the 'colourshop', a supplier of dry pigments and similar sundries.[383]

With the growing interest in etching, English nineteenth-century suppliers of artists' materials started selling etching materials, a development that can be traced through their materials catalogues. Ackermann sold a ball of etching ground at 1s in 1840 and a bottle of stopping-out varnish sold for the same price.[384] Sand's of London produced its own etching ground before the middle of the century.[385] Roberson asked the same price as Ackermann for its own ground ball in 1880.[386] Etching grounds by Winsor & Newton and by Rhind became renowned internationally in the latter part of the nineteenth century (Fig. 105).[387] Austrian author Joseph Roller complained that Rhind's ground was expensive: the ready-made product cost 1.20 *Kreuzer*, which would buy ten times as much raw material. Lately, he continued, etching grounds from Düsseldorf are favoured.[388] Raw materials and sundry articles could be acquired locally. Dutch etcher Carel Dake (1894) recommended Lamour in Paris for the candles used in blackening the etching ground.[389]

The merging of the larger suppliers of artists' materials expressed itself by the continuity of the production of etching grounds – the brand names of the former producers were retained but the products were sold through the new proprietors. For example, the English firm of Lawrence (est. 1859) marketed Rhind's grounds[390] and Lefranc & Bourgeois sold – and still sells – the renowned etching grounds of the French firm of Lamour.[391]

Etchants/mordants

The earliest fluids used for etching iron were mixtures of one or more salts in vinegar, urine or water.[392] The liquids were commonly available, but most of the salts had to be obtained from a grocer or pharmacy.[393] Until the nineteenth century, copper was also etched with such mixtures.

Nitric acid bites copper fast and easily, but was not produced in any significant quantities before 1500.[394] The corrosive fluid is not easily made at home and was therefore prepared by specialised 'refiners' (*affineurs, rafineerders*),[395] and continued to be sold at refiners or chemists throughout the centuries.[396] There was even a certain specialisation: a Mr Remnant in Smithfield-bars, London, prepared acids 'for the use of engravers' in the 1820s.[397]

The acid could be produced locally, but was also traded internationally. Flanders and Holland were important producers and thus exporters.[398] Eighteenth-century Amsterdam port books also mention that the acid was imported from England and Scotland.[399] Nitric acid, because of its aggressive chemical reaction, was kept and sold in glass bottles.[400] However, because glass bottles are fragile, strong acids cannot be shipped by standard mail in a number of countries and for this reason nitric acid is missing in the catalogues of Ackermann and Roberson. The second edition of Hubbard's manual (1923) included an extract from a letter by Sheppard Dale in which he explained that, for this reason, he used chromic acid made from powder because it could be sent by mail.[401] Similarly ferric chloride and copper sulphate have the advantage over corrosive liquids – these salts can be transported as dry powders to be dissolved in water in order to make etching fluids in the studio.

Paper manufacturers

From its first production in Europe, paper was manufactured by special mills and sold through paper merchants, a standard international trade from the early days.[402] Printers acquired their paper through local paper suppliers. Dealers in artists' materials also supplied printing paper after the middle of the nineteenth century.[403] As late as 1880, Koehler complained about how difficult it was to obtain quality European printing paper in the United States, but that the locally developed substitute worked well.[404] Paper remained a separate commodity with specialised distributors; there was also a growing availability of handmade European and Japanese papers.[405]

The number of producers of fine art printing papers declined considerably in the twentieth century. Following a series of mergers in France and England, the only major firm now left is Arjo Wiggins (France), manufacturer of such well-known brands as Arches, Rives and Johannot.[406] Other mills of importance include Hahnemühle, Zerkall (both in Germany) and Fabriano (Italy). These European papers are shipped worldwide. Smaller European firms are also found in Czechia, Finland, Russia and Spain. Stonehenge is the only brand of intaglio printing paper made in the USA. Japa-

nese *washi* manufacturers produce their famous papers, the thinner kinds of which are good for *chine collé* printing, while more voluminous intaglio papers are produced for normal printing. A growing number of small private mills producing handmade papers have been established in Europe and the USA in the past few decades.[407]

Printing ink
Until the nineteenth century, printers prepared varnish for printing ink by boiling linseed oil. There was, and still is, an extensive international trade in linseed and linseed oil. The oil with the best drying properties was the kind pressed from the seed of flax grown in the Baltic area. English records of import duties levied for 1657 state that linseed oil was imported into the country, but its provenance is not specified.[408] The eighteenth-century port books of Amsterdam are more detailed and show that a certain amount of linseed oil came from the Baltic area in 1776. The import of the seed was much greater and was continuous throughout the century.[409] Around 1900 the largest flax-producing countries were the Netherlands, Russia, Austria, Germany and France.[410] By the 1950s, linseed oil was mainly produced by North and South America, India and Russia.[411]

The majority of plates were printed with black ink and sources refer to various black pigments for intaglio ink.[412] Charcoal or bone black was used in most cases. From before 1600 to about 1900, a pigment made by charring the lees of wine and known as 'Frankfurt black' is the most commonly mentioned black pigment for intaglio ink.[413] It was traded through Frankfurt am Main as well as through Mainz and Strasbourg.[414] More detailed information on Frankfurt black is available from around 1790. The pigment was made at small towns such as Markt-Obereisensheim, Kitzingen and Mark-Steft, all on the River Main between Schweinfurt and Würzburg. It was shipped via the river and sold mainly via Frankfurt – hence its name – to the north, Holland, France and throughout Germany (see Fig. 215, p. 271).[415] Production of Frankfurt black seems almost on the level of a commercial enterprise given that it was sold all over Europe, but its production may only have been in the hands of a few.[416] For some unknown reason, the availability of Frankfurt black dried up around 1900, but its name lives on in certain blacks used for intaglio ink.[417]

Ink manufacturers
Ink, either for intaglio or relief printing, was prepared in the printshop or bought from a fellow printer from the earliest times.[418] The first references are found in the field of book printing and are mentioned here for comparison.

F. Petrus Thaler, vicar of the Carthusian house at Johannisberg, near Freiburg im Breisgau, wrote in a letter of 23 April 1508 to Friedrich Textoris, *famulus* of Johann Amberbach, that 'he has despatched to Basle a quantity of powdered vermilion, there to be mixed with varnish in the right proportions'.[419] The vermilion was to be ground to red ink for the printing of the rubrication in 400 copies of a book the brethren of Freiburg were to print on their own press. In other words, one printer, or even a specialised ink maker, was ordered to prepare a batch of ink to be used in another printshop in another town.

Two notaries, who visited four engraving studios in Paris in 1566, brought a batch of intaglio printing ink with them asking whether it was 'marketable',[420] ie someone was preparing ink to be sold to engravers or plate printers who did not make their own ink.[421]

An early reference to a professional manufacturer of intaglio ink dates from 1732 when Parisian citizens living in the area of the Estrapade ancienne complained about a man named Hoyau in La Rue du Puits-qui-Parle, who for his livelihood, made ink for plate printers.[422] Other ink makers worked for both book and plate printers, such as J. Termeulen in Amsterdam in the 1780s.[423] London address books starting with Pendred's in 1785 mention 'ink makers', without further specification, their numbers varying from three to eleven.[424] The ledgers for 1833 of the London plate printers Dixon & Ross mention a Ross Senior as a supplier of their ink, presses and other commodities, but normally they made their own ink.[425] Paris statistics counted nine ink makers in 1835.[426]

The first larger scale producer of intaglio inks was Charles Lorilleux of Paris in 1818.[427] The establishment of his business is evidence of the growing demand for printing ink and the number of ink manufactories expanded in the decades following. The German firm of Fischer & Naumann announced publicly the establishment of their factory for letterpress, lithographic and plate printing ink in Ilmenau on 1 January 1837.[428] German manufacturers gradually became leaders in the printing ink market in the second half of the nineteenth century, exporting overseas, with the exception of the finest quality intaglio inks, which were imported into Germany.[429] The Paris ink manufacturer Charbonnel (est. 1862) would have been among those selling quality inks to Germany, in particular for intaglio printing.[430] By 1880, Lorilleux had appointed Charles Mayer of 62 Holborn Viaduct, E.C., as its London agent, later establishing cooperation with the firm of Bolton, based at the Eclipse Works, Tottenham Hale in north London.[431] The international expansion of this firm marks the increase of industrial ink manufacture in the second half of the nineteenth century when ink making disappeared from the printshop.[432] Nowadays the world market for intaglio printing ink is supplied by only a few manufacturers.[433]

Press manufacturers

The roller press was a machine constructed of wood from the second half of the fifteenth century to the middle of the nineteenth.[434] The mechanic Zonca (1607) was the first to explain the construction of a roller press, illustrating the apparatus and also showing the rollers and bearings separately. Bosse (1645) gives descriptions of the construction of a roller press illustrated with detailed designs including scale bars and measurements, for the use of engravers located too far away from a printshop.[435] His designs were copied in most editions of his treatise, but the measurements were not given in the 1745 and 1758 French editions and their translations.[436] Apparently the construction plans with their descriptions were clear enough for a joiner to understand as a similar compact description with a simple design can be seen in the third volume (1775) of André Roubo's *Art du menuisier*.[437] Starting with Jacob Perkins (1813), metal roller presses were designed by engineers, constructed in factories and traded internationally.[438]

The wooden roller press

Manufacturers of the earlier presses were woodworkers such as carpenters and joiners.[439] A comparison can be drawn here with the manufacturers of typographic presses. Joseph Moxon in his *Mechanick Exercises* of 1683/84, the first complete description of typography, refers to the joiners and smiths for the construction of a new book printing press, which he illustrates with some designs.[440] There is even a specialist manufacturer, the 'Printers Joyner (as here in *London* he may be furnisht with)'.[441]

Historical references to press manufacturers are rare and only a few are known by name. The joiners Charles Gaudron and Guillaume Guyot, working in the Paris *faubourgs*, were apparently specialists in printing presses, as evidenced by a transaction for two presses in 1600.[442] The wooden roller press currently owned by the Portuguese Mint is the only one of its kind that can be attributed with certainty. It was made by Jacob Bernard Haas, a producer of mathematical and nautical instruments in Lisbon, in 1802 or shortly afterwards (Fig. 106).[443] Less certain is the attribution of a wooden roller press from probably the first half or middle of the nineteenth century kept in the Musée de l'Imprimerie in Brussels. It has the name 'Pernet', perhaps the manufacturer, stamped in the cheek on the side of the cross and in the top crossbeam.

The trade in presses is occasionally documented as shown by the following examples. Roller presses are found occasionally in inventories drawn up after a death or when a printshop went out of business, in which case they could be auctioned.[444] The oldest extant wooden roller press is now in the Museum Plantin-Moretus in Antwerp (Fig. 107). Balthasar IV Moretus ordered the machine through his Amsterdam contact Ysbrand Vincent, a paper merchant, in 1714.[445] The name of the constructor is not given, but it may have been Arend Smit(s), a famous manufacturer of typographic presses, although there were other press manufacturers active in eighteenth-century Amsterdam.[446] Together with the press were ordered and delivered the felts, four ink balls of the best quality, a vessel with lid for cooking the oil, a stone and muller for grinding the ink, and a brazier and grill for heating the plates. The total sum amounted to 217 Dutch *guilders*.[447]

Intaglio printmaking started in the English colonies in North America shortly after 1700. Francis Dewing 'who Engraveth and Printeth copperplates' was the first professional engraver in the region. It is unlikely that everything he would have needed for his trade would have been available there so he brought with him a roller press capable of printing larger plates on his arrival in Boston from London in 1716.[448] Danish engraver Jacob Fosie, who trained in Holland in the same period, found it difficult to get the right materials and equipment in Denmark so with the help of his former Dutch teacher, Johannes de Ruyter, he bought a press in Holland which he had delivered to Copenhagen.[449]

The metal roller press

With the abolition of the guilds around 1800 their restrictions disappeared. This paralleled the emerging use and development of cast iron for the production of a multitude of objects and machines.[450] Both developments stimulated private enterprise and the first metal typographic presses were marketed in this period with metal roller presses following shortly after.

Nineteenth-century developments can be followed by studying patents. The first modern metal press, for example, was designed by Jacob Perkins, an American inventor who worked in England and who patented his inventions regularly.[451] The applicants of the patents were generally the engineers who designed the presses rather than their actual constructors. It is therefore satisfying to read that when Richard Solly presented his improvements for a metal roller press in 1819 he let the reader know: 'it is but justice to Mr. [J.] Clement, to state, that it is principally through his assistance I have been enabled to complete these improvements in the copper-plate printing press'.[452] Similarly, German book printer Georg Jöntzen had a combined relief, lithographic and intaglio press built to his design. In the article discussing his press (1836) he paid due respect to father and son mechanics Meinecke, and the *Schlosseramtsmeister* Marcus for their input.[453]

Demand was escalating and press-manufacturing companies started to flourish. German *Schlossermeister* Karl Krause started the production of bookbinding and printing machines, including cast-iron roller presses, in Leipzig in 1855. The firm expanded to become perhaps the largest of its kind, or at least the most well known, and many of its surviving machines are still operated.[454]

Some nineteenth-century English press manufacturers include Flanders, Furnival, John Haddon & Co, George Wailes & Co and Hughes & Kimber (est. c.1820, Fig. 108) all from London, with J. Grieg & Sons based in Edinburgh. Among the well-known French establishments were Aubert and Fleury from Paris, Ledeuil who moved from Paris to *faubourg* Montrouge, and Dominique Van-de-Weghe of *faubourg* Saint-Jacques.[455]

English carpenter Robert Hoe, who arrived in the United States in 1805, joined Matthew Smith to produce a wide variety of machines including roller presses.[456] Early twentieth-century American press manufacturers include Kelton & Co. from New York, and Wanner Machine Co. and Lee Sturgis from Chicago.[457]

The new generation of artist-etchers considered that they should also proof their own plates. Roberson & Co. was the first to offer a more compact table press especially made for the artist-etcher and the amateur (see Fig. 99).[458] Other suppliers followed, such as Vve. Cadart in Paris (see Fig. 250, p. 308). From this idea and the growing interest from amateurs, it was suggested in the 1890s that the etcher himself could also manufacture his roller press. World-wide, about sixty manufacturers of roller presses were active around the year 2000, with the earliest firms established in the 1960s. It seems a lucrative business given that many export their presses worldwide.

Discussion

Originally, mainly local materials were used for intaglio printmaking but in the seventeenth and eighteenth centuries an international trade emerged. Paper had already been shipped long distances from the start of its European production but now also plates, acids, tools, pigments and occasionally roller presses were imported. The trade in these materials fulfilled the need for prints of a technically increasing quality, a development stimulated by the interlaced ambitions of engravers, printers and publishers with their audience. Between 1820 and 1860 this culminated in the production of steel engravings in high numbers, but nearly all the processes were still performed manually.

The handcrafted print made way for the large-scale mechanised printing trade that emerged in the middle of the nineteenth century. Some – perhaps a thousand all in all throughout Europe – artist-etchers favoured manual printmaking; a modest number compared to the many employed in the printing trade. More important for suppliers was that etching, together with other artistic expressions such as painting and drawing, grew in popularity among amateurs, the major consumers of artists' materials both then and now.

After an initial steep increase in the second quarter of the nineteenth century, there followed a steady decline in the number of intaglio printshops in Paris due to the expansion of the printing trade to the point where none survive today.[459] It is a similar story with the London printshops of which now only one is left of the once famous nineteenth-century printing houses, Thomas Ross Limited (est. 1833).[460] The loss of regular work was compensated by an increase in artistic assignments, especially for colour printing, after 1890.[461] The ink manufacturer Charbonnel, specialist in fine art printing inks, flourished because of this between 1900 and 1930, but they had to give way to the offset printing industry until the firm was finally taken over by Lefranc & Bourgeois in 1989;[462] the latter is the only nineteenth-century French producer and supplier of printmaking materials still in existence.[463]

Due to a growing interest in prints starting in the 1960s the demand for printmaking materials increased considerably, creating a close-knit system of producers of artists' materials, press manufacturers and supply stores.

Notes

1
Bartl et al. 2005: 17, *Wohl ist der Menschen Müh' und Arbeit nicht allein Strafe fürs verlorene Paradies, sondern wir dürfen uns durch sie in freundlich geformter Verbindung mit dem Großen Schöpfer und Werkmeister verstehen*.

2
For a further discussion on this theme see Introduction, p. 6.

3
For women printmakers see: *Donne artiste 1986*; *Harvey-Lee 1995*, *2004*. For a study of Diana de Mantua see: *Lincoln 2000*: 111–145. The style of some fifteenth-century religious prints suggests to me that these might have been engraved by women, see also: *Enschedé 1918*. For women preparing ink to print their husbands' engravings in Paris in 1566 see: *Bimbenet-Privat & Le Bars 1994*. Hönn alluded to plate printers who used their wives and family to print the plates to reduce costs; *Hönn 1721*: 457. Regulations of the Paris guild of plate printers assume the presence of female plate printers stating that *Les presses ne peuvent êtres tournées pard'autres que par les compagnons, femmes, fils & filles de maitres*; *Encyclopédie méthodique 1782–1832*, Arts et métiers mécaniques, 3: 624. Because German plate printers were not bound to a guild they could also employ women to do the printing; *Oeconomische Encyclopädie 1773–1858*, 56: 228; *Voit 1786–1790*, 2: 104. William Blake's wife Catherine printed his plates; *Bentley 1978*, 2: 1569–1570; *Keynes 1980*: 52; *Phillips 2004*: 35 n. 39.

4
The copying of engravings is found regularly in the fifteenth century, see Chapter 1, p. 43.

5

With thanks to Charles Morgan for encouraging me to write this section.

6

Despite the many compendia for engravers and print publishers, there is no such work for plate printers.

7

Krünitz 1792: 242.

8

Reinhold 1788: 280. Félix Buhot exclaimed: *Ces barbares bourreaux aveugles ont massacré mes planches*; *Zilcken 1900*: 301.

9

Gessner stated that it is imperative that a copper engraver knows how his plates are printed and that a good artist should know how to print his plates by himself; **Gessner** (Leipzig 1740–1745) 1, 2nd part (1740): 202, item 'Kupferdrucker'. Plate printers should work under the eyes of the engravers; *Deutsche Encyclopädie 1778–1804*, 23: 711 col. 1–2. Paul Schwarz informed young artists about printing to prevent disappointment when having their first aquatint plates pulled by a professional printer; he also advised the artist to help the printer mix colour inks; **Schwarz** (Nürnberg 1805): 89–90, 92. Friedrich Netto highlighted the mistakes made in printing and how to recognise them in the proof; **Netto 1** (Dresden 1815): IV, 35–36.

10

Filleau des Billettes (Paris 1693–1698): 116, 122; *Deutsche Encyclopädie 1778–1804*, 23: 711 col. 1–2, 'Kupferdrucker, Kupferdruckerey'; **Verheijden** (Den Haag 1736–1739): 106.

11

From the 1470s onwards gradually more engravers appear in Italy who cut their plates after other persons' designs; *Gramaccini & Meier 2009*: 53, 65, 66, 132–133, 243, 449.

12

Engravers cut their initials or personal marks in plates from the middle of the fifteenth century on; Appendix 2, p. 409. Fig. 21, p. 27, shows an early use of the term *fecit*, which would normally refer to the engraver in later times, but here refers to the designer Bramante; *Landau & Parshal 1994*: 104. The suggested statutes for a guild of engravers and plate printers in Paris drawn up in 1640 note that the names of engraver, inventor and publisher should be engraved in the plate: *Préaud et al. 1987*: 16 no. 13. For a discussion about specialisation and the division of labour in Italy in the sixteenth century see: *Bury 2001*: 68–74. For a list of abbreviations in addresses see Appendix 3, p. 413.

13

See below under 'The printmaker's workshop'.

14

Ms. in Archivio di Stato, Mantua, *Notarile*, Galeazzo Giudici, 76 (5 April 1475). *Canova 2001*: 149–151, for the contract, with a further essay on the discussions about plates engraved by Mantegna himself or produced in his studio.

15

Hind 1938–1948, catalogue pp. 304–309. For Francesco Rosselli see also Chapter 1, p. 25. The trade in prints is much older and, although not yet a specialisation, prints were a commodity sold together with other goods by 1500.

16

Gramaccini & Meier 2009: 35, 71; *Vasari 1568*, 2 (*Primo Volume della Terza Parte*): 300.

17

Witcombe 2008: 11.

18

For an overview of the development of print publishing in Italy see: *Bury 2001*: 68–78. See also: *Gramaccini & Meier 2009*: 74; *Rubach 2008*.

19

AKL 21 'Cort, Cornelis': 342; *Bierens de Haan 1948*: 226–228. The inventory only describes drawings and prints; no other goods, such as his clothes, are mentioned. Nevertheless, one may consider that engravers, such as Cort, travelling to Italy would have brought their tools and some copper plates. Because of the weight and volume it is unlikely that they carried roller presses with them so they would have made use of the services of a local plate printer. The itinerant engraver might have carried all he needed for his business including a (small) press in a carriage.

20

Schraven 2002: 119.

21

City Archives of Antwerp, Ms. SR 198: fol. 189r–190v and Not. 2071, Notaris Zeger 'sHertogen Sr., Protocollen 1540–1543, 1543: fol. 113r–v. *Meier 1941-3*: 499; *Van der Stock 1998*: 337–339; *Verheyden 1910*: 195–196.

22

Could it be that Engele Henrickx printed the plates herself? Should we see her as a plate printer or did she organise the printing and employ someone else to print the plates? Because Hendrik Terbruggen had to settle the debt with her, she would at least have managed the sale of the impressions.

23

AKL, 20, 'Cock, Hieronymus': 69; *Van der Stock 1998*: 145. Plate printer Sander Jansens was one of the specialists employed by Cock. The role of Cock's wife Volcxken Diericx as partner in his business needs further research.

24

Juan de Valverde de Amusco, *Vivae imagines partium corporis humani*, Antwerp: Plantin, 1566, was printed in an edition of 600. The Dutch translation (*Anatomie oft levende beelden vande deelen des menschelicken lichaems*) of 1568 was printed in an edition of 450. *Imhof 1992*: 149; *Voet 1969–1972*, 2: 203, 226.

25

Voet 1969–1972, 2: 221–222. The inventory made up at Plantin's death in 1589 records that he owed a roller press by then, but it is not clear what it was used for or that it was used for printing editions in-house.

26

Plate printers mentioned around 1600 are Lynken van Lanckvelt and Mijnken Liefrinck, both women entrepreneurs, but it is not clear whether they actually printed the plates themselves; *Bowen & Imhof 2001*; *Voet 1969–1972*, 2: 203, 226.

27

Arch. 31, f. 180v and Arch. 32: fol. 270r, Antwerp Archives. *Voet 1969–1972*, 2: 221–222, n. 6.

28

Perhaps Van Mander supposed that Lucas learned printmaking from a goldsmith. He does not mention other plate engravers in Lucas's time, so he might have asked himself from whom Lucas did learn the process. Van Mander's use of the conjunctive *soude* (should) indicates that he did not actually know for certain and thus his phrase is more of a suggestion than a recorded historical fact; *Van Mander 1604*, f. 214r. See further Chapter 1, n. 263, p. 71.

29

Jacobowitz & Stepanek 1983: 20–21. Lucas van Leyden printed his own plates, or had them printed by someone in his workshop, because professional copper engraving was still in its infancy in the northern Netherlands before the middle of the sixteenth century. Only a few other copper engravers were active in the nothern Netherlands contemporaneous to Lucas van Leyden: Allaert Claesz. (active Utrecht 1520–1555) made engravings, Jan Gossaert (active in various towns 1503–1541) made a handful engravings and etchings 1520–1525. Maarten van Heemskerck (1498–1574) made hundreds of designs for engravings cut by Coornhert and Galle, but did not himself engrave; perhaps he made some etchings. Jan van Scorel (1495–1562) produced woodcuts, but is not known as a copper engraver. Jan Swart (c.1496–1558) produced woodcuts and designs by him are etched, the etchings being published by Hans Liefrinck in the 1550s. Leonard Thiry (b. in Deventer ?–1550) produced etchings and engravings (School of Fontainebleau), but probably only after his visit to Rome around 1530. Jan Vermeyen (c.1500–1559) made etchings, but travelled widely.

30

The proofs are not printed by rubbing because the impressions are too homogeneous; they do not show the typical incoherent doubling of lines and the larger plates are too big for printing by rubbing; see Chapter 4, p. 327.

31

This leaves open the question of where or from whom Lucas did learn about preparing the ink, wiping the plate, the construction and operation of a roller press.

32

AKL, 21, 'Coornhert, Dirck Volkertsz.': 92; *Bialler 1992*: 174 fig. 93; *Coelen 1995*: 123; *New Hollstein Dutch & Flemish*, 'Maarten van Heemskerck', 1 (1993): 11.

33

New Hollstein Dutch & Flemish, 'Philips Galle', 1 (2001): xxxvi–xxxviii; *New Hollstein Dutch & Flemish*, 'Maarten van Heemskerck', 1 (1993): 12. Philips Galle contracted plate printers; *AKL*, 48, 'Galle, Philips': 10–11. Galle's colleague in Antwerp was Gerard de Jode, who was active as an engraver and plate printer from 1547 to 1591; *Waller 1974*: 164.

34

Waller 1974: 47. The suggestion that Van Breen assisted Goltzius as printer for his copper plates and woodcuts is based on a woodcut in black on blue paper heightened in white after Hendrick Goltzius in the Rijksmuseum, Amsterdam (RP-P-1883-A-6855) dated 1586–1590; *Schapelhouman 2000*: fig. 3; *Waller 1974*: pl. X opp. p. 52. Underneath is written in a seventeenth-century hand: *Gillis de Vreen kunstdrucker* [art printer] *van H. Goltzius*. Support for this comes from a remark by Van Mander that Goltzius (whom he knew personally) left his apprentices and the 'printer' at home (*en latende t'huys verscheyden Discipule[n], en den Drucker*) when he travelled to Italy in 1590; *Van Mander 1604*: fol. 282v. I am grateful to Marjolein Leesberg for this information. The portraits of Van Breen are perhaps the earliest portraits of a specialist plate printer.

35

Molhuysen 1913: 93.

36

The following is a list of the names of seventeenth-century Dutch print publishers/plate printers, most of them also working as engravers, where and when they were active, the majority being active in the first half of the seventeenth century: Carel Allard (fl. Amsterdam 1673–1709), Balthasar Florisz van Berckenrode (fl. in various Dutch towns 1591/1592–before 1646), Justus Danckerts (fl. Amsterdam 1664–1701), Abraham Goos (fl. Amsterdam ?–before 1643), Pieter Goos (active Amsterdam, c.1616–1675), Rombout van den Hoeye (fl. Amsterdam, 1638–after 1664), Hendrick Hondius I (fl. The Hague 1597–1642 and in Leiden from 1604 to 1606), Willem Hondius (fl. The Hague, Danzig, Poland, 1636–c.1658), Frederik van Hulsen (fl. Nürnberg, Frankfort Main, London 1602–1627), Pieter van der Keere (fl. Amsterdam, 1593–1630), Johannes van Londerseel I (fl. Rotterdam (Delft 1614) 1610–1624), Dirk Evertsz Lons (fl. Amsterdam 1615–1666), Joannes Loots (fl. Amsterdam 1685–1724), Pieter Nolpe (fl. Amsterdam c.1640–1652), Joachim Ottens (fl. Amsterdam 1689–1720), Johannes de Ram (fl. Amsterdam 1678–1693), Hendrick van Schoel (fl. Rome c.1595–1622), Claes Jansz Vischer (fl. Amsterdam 1606–1652); *Waller 1974*: 3, 21–22, 75, 114–115, 144, 147, 148, 156, 170–171, 205, 205, 206, 240, 247, 265, 291, 345. Cf. the activities of Pierre Mariette, plate printer and print dealer in Paris (fl. 1638–1657); *Meyer 2006*: 307–308, below right *S'Imprime et se vend a pnt A Paris chez Pierre Mariette*.

37

Claesz 1609, f. Aijr; *Claesz 1610*, f. B4r.

38

Van Dillen 1933: 254–255, *ick sal se mijn drucker maer altemets in hande geven om mede te drucken*.

39

It would have been common for Dutch engravers working around the turn of the century still to publish and even print their own work. Chrispijn de Passe the Elder (c.1565–1637), for example, still encompassed all disciplines being active as an inventor, engraver, printer and publisher. Other engravers are known to have had roller presses in their studios: Inventory of Jan Jansz. van Deutecom, Rotterdam, 23 January 1608; *Algemeen 1883*; *Alting Mees 1913-1*. Inventory of Johannes van Londerseel, Rotterdam, 3 January 1625; *Alting Mees 1913-2*: 244. Pieter Nolpe (c.1614?–1652/53), Amsterdam; *Waller 1974*: 240.

40

References to plate printers: *Van Dillen 1929*: 711 no. 1191, Amsterdam 18 April 1611; *Van Dillen 1974*: 541 no. 1059, Amsterdam, 28

October 1649. The rules of the Delft guild of St. Luke of 7 October 1642 mention both *plaetsnijders* (engravers) and *konstdruckers* (usually plate printers). This is a copy of the rules of 29 May 1611, with extensions of 6 November 1611 and 2 July 1612, after an authentic copy of 14 July 1612; *Miedema 1980*, 1: 239.

41

The request is dated 24 September 1661, the ordinance is dated 16 December 1661, the guild was established on 20 January 1662, the *gildebrief* is dated 9 November 1663, with extensions on 28 January and 14 July 1666; *Van Dillen 1974*: 692 no. 1472, 696–697 no. 1480, 713 no. 1510, 740–741 no. 1559; *Van Eeghen 1965*: 100, 102–103, 106.

42

Archives Nationales, Paris, shelfmark: Minutier Central, XLIX, 126, the Minutes signed by G. Cadier and M. Charpentier; *Bimbenet-Privat & Le Bars 1994*; *Stijnman 1994*.

43

Meyer 2006: 257, 278, quoting: Guillaume Le Gangneur, *Instruction et mémoire pour déduire le fait du Gaigneur pardevant Messieurs de la Cour* (Paris): (Gaigneur?) (1599) (Ms in BnF, Z Thoisy-369 (140)): 5. *Vasselin 2007*: 92, 238.

44

Garzoni 1641: 366–367, *wie solches die beystehende Figur mit mehrerm zuersehen gibet*, fig. on p. 367 (see Fig. 11, p. 12).

45

For Bosse see: **Bosse** (Paris 1645): titlep. (*Graueur en Taille Douce*), p. 57 (*imprimer … pas de ma profession*). For Tavernier see: *Join-Lambert & Préaud 2004*: 320; *Servin 1620*, pt. 2: 19. Pierre le Muet, *Maniere de bastir pour touttes sortes de personnes*, Paris: Tavernier, 1623, the *impressum* reads *Melchior Tavernier Graueur Imprimeur du ROY pour les tailles douces*; see also other publications by Melchior Tavernier for similar *impressums*.

46

See below under 'Engravers – Status'.

47

Coyecque 1964, 2: 95–96 nos. 38, 40; *Dictionnaire portatif 1766*, 2: 73; *Lespinasse 1879–1897*, 3: 700, 716–717. It was suggested that both engravers and plate printers should be members of the same guild in 1640, but nothing came of it; *Préaud et al. 1987*: 15. The plate printers' guild was established in 1692 and received letters patent in 1694. Their members had to reside in the Université area and could keep only one workshop; *Lespinasse 1879–1897*, 3: 700, 716–717. An earlier community of thirty plate printers was established in Paris in 1677; *Coyecque 1964*, 2: 95 no. 34.

48

Le Bitouzé 1991: 36.

49

AKL, 8, 'Beaujean, Michel' and 'Beaujean, Jean Louis': 70.

50

Courboin 1914: 120; *Coyecque 1964*, 2: 106 no. 18; *Encyclopédie méthodique 1782–1832, Arts et métiers mécaniques*, 3 (1784): 624. The *Conseil d'Etat du Roi* of 13–27 July 1734 was confirmed on 23 August 1734. The 1694 regulations of the Paris guild of plate printers already stipulated that only master plate printers were allowed to own a press, with the exception of the six engravers established in the Louvre; *Lespinasse 1879–1897*: 717. A similar rule was applied in The Hague in the eighteenth century, where according to regulations cartographers were allowed to print their own proofs, but editions were to be printed by a professional plate printer; *Sloos 2003*: 265.

51

Archives Nationales, Paris, AD XI-19, *Délibération de la communauté des maîtres imprimeurs en taille-douce du 23 octobre 1741*; *Le Bitouzé 1991*: 36, 38, p. 42 n. 4.

52

Coyecque 1964, 2: 106 nos. 15–16; *Burch 1910*: 62.

53

Roubo 1977 (repr. 1769–1775), 3: 970–971 pl. 327. The press would have been meant for amateurs of the higher social classes who etched as a hobby and wanted to print their plates at home, see below, p. 87.

54

Butzmann 1966: 257–258; *Weigel 1698*: 205–206. Perhaps this is the situation depicted by Matthäus Küsel in his *Interior of an Engraver's Workshop* (see Fig. 70).

55

Deutsche Encyclopädie 1778–1804, 23: 711; *Oeconomische Encyclopädie 1773–1858*, 56: 228; *Voit 1786–1790*, 2: 103–104. The plate printers in Nürnberg had their own coat of arms; *Ueber Herkunft, Gebräuche, Meisterstück und Wappen der Handwerke und Künste der Stadt Nürnberg bis zum Anfange des 18. Jhts* (c.1700), Wolfenbüttel, Herzog August Library, Cod. Guelf. 391.5 Novi: 163 (*Kupfferdrucker*).

56

Maxted 1977: xxii, xxiii, xxv, xxvi. Already mentioned is that Catherine, William Blake's wife, together with Blake himself, printed his plates at their home, which probably means that he taught his wife how to print his plates; *Bentley 1978*, 2: 1569–1570; *Keynes 1980*: 52; *Phillips 2004*: 35 n. 39. John Linnel tried to sell the press for Catherine on Blake's death in 1827; *Phillips 2003*: 18. T. Geoghegan (fl.1775–1805) was a London engraver and plate printer, also active in letterpress printing; *Spelman 2002*, 48: 18 item no. 32.

57

Gaskell 2004: 217–218; *Maxted 1977*: xiii, xvii–xviii.

58

Larson 1985: 4; *McNeely Stauffer et al. 1994*, 1: 64–65; *Shadwell 1969*: 33, fig. 48; *Wroth 1994*: 285.

59

Allodi 1980: 199; *Amerikaans leven 1982*: 6 fig. 1; *Hunnisett 1998*: 342; *Shadwell 1969*: no. 25; *Stephens 1950*.

60

Wroth 1994: 287.

61

For further details, see Chapter 3, p. 228.

62

See Chapter 4, p. 304.

63

For steel engravings see Chapter 3, p. 134.

64

The growth of lithography had a considerable negative impact on engraving in Austria; *Edlem von Keeß 1823*, 2: 44.

65

Dyson 1984: 84. The 1817 edition of *Johnstone's London Commercial Guide & Street Directory* contained the addresses of 126 engravers, which would mean that – following Pye – there were some 600 engravers active in London by 1836; this seems exaggerated although there was certainly more employment; *Maxted 1977*: xxv. See Chapter 4, p. 304.

66

Berthiaud (Paris 1837).

67

See for example: *Devrient 1862*. This volume showcases the capacities of a printing establishment capable of performing nearly every graphic process of the day.

68

Ramshaw (1819).

69

Courbin 1988: 179; *Dyson 1984*: 85–86, 91; *Frèrebeau 1974*: 25.

70

Uebersicht 1855: VII: *III. Statistik der Kupfer und Stahlstichdruckereien*.

71

Frizot 1998: 22–31; *Nadeau 1989–1990*.

72

See Chapter 3, pp. 137 and 226.

73

For further discussion see Chapter 3, p. 228 and Chapter 4, p. 309.

74

Denison (London 1895): 92.

75

In Paris, for example, the number of intaglio printshops reduced from 137 in 1860 to 74 in 1915; *Frèrebeau 1974*: 12. *Dyson 1984*: 10.

76

See below under 'The printmaker's workshop'.

77

Neale (Springfield 1927).

78

See: **Delâtre** (Paris 1887); **Goulding** (Sterling 1910).

79

Landau & Parshall 1994: 7–12; *Prints 1996*: 624–625.

80

Well known is the print production by artists at the court of Fontainebleau in the 1540s; *Zerner 1969*. Jacques Callot had his room, which was probably also his atelier, in the ducal palace in Florence, into which a printshop was built in 1619; *Bruwaert 1914*: 841–842. For a printshop in a nunnery near Malines in the fifteenth century see: *Enschedé 1918*; *Hind 1963-2*: 83–84. It seems that the itinerant engraver G.M. supplied this nunnery, and another one near Dendermonde, with engraved plates, or perhaps even printed for them; *Bradshaw 1889*: 247–252. Concerning peripatetic printmakers, French *dominotiers* travelled from market to fair to sell their prints and were probably free from guild duties, but they were not allowed to take on apprentices. *Dominotiers* are mentioned in relation to woodcuts only – there is no information about them also producing engravings or etchings. According to the edict of 27 June 1577 and later regulations *dominotiers*, *imagers* and *tapissiers* were not allowed to own a typographic printing press, although they could have a press with a large tympan with a wooden bed (ie without a stone plate) and without points for registrations; *Servin 1620*, pt. 1: 11, 15–17. Alternatively they could print their woodblocks manually; *Berg & Rooijakkers 1990*: 268; *Garnier 1869*: 151.

81

The block printer Jan van den Berghe (*Jan de Printere*) refused to become a member of the carpenters' guild at Leuven in 1452 because he created imagery and thus held himself in higher esteem than just a craftsman. He was, however, ordered to join the guild because other printers before him also had to join; *Hind 1963-2*: 83, 89, 211. This case probably concerned textile printing with woodblocks. The book printer Adriaan van Liesveld refused to become a member of the Antwerp guild of St. Luke in 1495. He argued that because he did not use brushes and paint to produce imagery he was not obliged to join the guild, which was accepted; *Van der Stock 1994*: 156–157, 162–163; *1998*: 310–311. The Antwerp book printers and publishers, and probably also the plate printers and print publishers, were free until 1557, but were obliged to become members of the guild of St. Luke in 1558; *Van der Stock 1994*: 160–165.

82

Huth 1967: 6, 9–11. Painting and sculpture were free arts and not bound to a guild in Nürnberg until the end of the sixteenth century; *Huth 1967*: 8–9. In Bern guilds were forbidden from preventing craftsmen from gaining too much political influence; *Wagner et al. 1979*: 2.

83

Van der Stock 1998: 27.

84

Ibid., 378–384.

85

Van Dillen 1974: 692 no. 1472, 740–741 no. 1559; *Van der Meulen 1897*: 47–52;*Van Eeghen 1965*: 100, 102–103, 106. By 1663 map or plate printers had to be citizens of the town of Amsterdam and guild members before they were allowed to handle a press; *Boekenoogen & Lessen 1931*, col. 2090.

86

Miedema 1980, 1: 94, 314. Plate printers were part of the guild of St. Luke in Haarlem in 1631, 1635 and 1642. Klaes van Hoeck asked the municipality for protection against the claims of twelve different guilds in 1688. He had come from Leyden to Haarlem to work as a plate printer. Finding little employment in that town he started planishing copper plates to earn an income for both him and his sister, upon which he was confronted by the local guilds. Perhaps there were plate printers in Haarlem in 1702, 1715 and 1751.

87

Lespinasse 1879–1897, 1: 188–191. For example, the guilds in Holland – then the French department of the Zuiderzee – were formally abolished on 31 January 1812; *Van Eeghen 1965*: 129.

88

Van Eeghen 1965: 107. It is unlikely, for moral reasons, that girls with a talent in the visual arts would have been apprenticed outside of the family. Magdalena de Passe came from a family of engravers and she was probably trained by her father, for example; *Veldman 2001*: 200; *Waller 1974*: 250.

89

Five years was the length of time Merten Maes was apprenticed to Gerard de Jode in Antwerp on 1 December 1549; *Van der Stock 1998*: 371–372. Six continuous years of apprenticeships was suggested for engravers and plate printers in Paris in 1640; *Préaud et al. 1987*: 15 no. 1. On 1 November 1649 an Amsterdam plate engraver accepted an apprentice for four years to teach him the craft of plate cutting both in copper, wood and other materials, which he used in his trade of printing caps and other clothes; *Van Dillen 1974*: 542 no. 1061. The ages of apprentices to Paris engravers varied between 10 and 19 years old in the later sixteenth and early seventeenth century; an adult was accepted only occasionally. Apprenticeships lasted from one to nine years; *Grivel 1994*: 40–41.

90

Huth 1967: 10; *Wolf 1990*: 863. The Wierix brothers Johan and Hieronymus dated their earliest plates, precise copies after Dürer's works, and both engraved their ages in the plates from their 12th year onwards. Although they were child prodigies, studying engraving technique still takes time and they would have started their first excercises perhaps two years earlier. They both entered the guild of St. Luke in Antwerp in 1572, at the ages of 23/24 and 19/20 respectively; *Hollstein Dutch & Flemish*, 69, *The Wierix family, introduction and guide to the catalogue*: xi, xv; *Von Wilckens & Strieder 1978*: 25, 111, 117, 163. Training for map engraving lasted six years at the London Admiralty in the twentieth century; *Cooney 1996*: 37.

91

Wolf 1990: 864. Domenico Tempesti came from Florence to Paris to study engraving in 1677, see below. The Spanish government offered grants to Spanish engravers to study in Paris in the eighteenth century; *Hind 1963-1:* 202; *Vega 1989*: 89; *1995*: 149. Danish engraver Jacob Fosie studied in Amsterdam and London in the earlier eighteenth century; *Fosie 1743*: [9], [12]. Frederick Goulding worked in Paris during his itinerant years in 1864; **Goulding** (Sterling 1910): 30.

92

Before that the number of apprentices, either to engravers or printers, does not seem to have been restricted; *Grivel 1994*: 41.

93

Dictionnaire portatif 1766, 2: 73; *Encyclopédie méthodique 1782–1832, Arts et métiers mécaniques*, 3 (1784): 623–624.

94

Wolf 1990: 867.

95

Krünitz 1792, the plate accompanying p. 240, which is a copy after the heading to the chapter on printing in *Halle 1761* (p. 223), which in its turn is a copy of Bosse's plate of 1643.

96

Deutsche Encyclopädie 1778–1804, 23: 711 col. 1–2: 'Kupferdrucker, Kupferdruckerey'; *Oeconomische Encyclopädie 1773–1858*, 56: 228; *Voit 1786–1790*, 2: 105; *Weigel 1698*: 206. Weigel is followed by Voit and the *Oeconomische Encyclopädie*, and the author even encourages engravers to occupy themselves with plate printing.

97

Compare this with Merian's engraver's studio.

98

For apprenticeships in general and for apprenticeships of engravers in particular in France from the sixteenth to the eighteenth century see: *Vasselin 2007*: 24–27, 92–93.

99

Grivel 1994: 41.

100

Bibliothèque Nationale, Paris: Minutier central, LXXXIV, 72, of 16 juillet 1620: fol. 1r–v; *Lothe 1993*: 35.

101

Courboin 1914: 21.

102

Wolf 1990: 863.

103

It was not uncommon for book and plate printing to be carried out in the same workshop, as described above, thus a comparison of working conditions is acceptable.

104

Löwenstein 1987.

105

Lespinasse 1879–1897: 716.

106

Van Eeghen 1965: 108–109.

107

Vordem war der Kupferstecher und der Kupferdrucker in Einer Person vereinigt, jetzt sind es aber Zweyerley Künstler; jener wird zu den freyen, dieser zu den mechanische gerechnet; *Deutsche Encyclopädie 1778–1804*, 23: 711 col. 1–2: 'Kupferdrucker, Kupferdruckerey'. See again Küsel's workshop interior (Fig. 70).

108

Mortimer 1974: 252–253.

109

Gramaccini & Meier 2009: 133; *Landau & Parshall 1994*: 104.

110

Grivel 1994: 41.

111

Meyer 2006: 264.

112

Other references document engravers working by lamplight, see below, p. 92.

113

Dyson 1984: 50–52.

114

Cochin (1767) remarked that lighting conditions for engraving delicate work were poor in wintertime, with only four to five hours of proper lighting to none on grey days; *Furcy-Raynaud 1905*: 105.

115

Goldsmiths were in a more advantageous position due to the fact that they worked with precious metals and therefore were in regular contact with the higher echelons of society; *Karcher 1911*: 70.

116

Stijnman 2010-3.

117

Vasari paid attention to engraving in his life of Marcantonio Raimondi, with reference to the Florentine Maso di Finiguerra, but only in the second edition of his *Vite*; *Vasari 1568*, 2: 74–101. On the position of printmaking in the arts see below, p. 89.

118

The definitive letters patent date from 12 August 1634; *Dictionnaire portatif 1766*, 1: 583–584.

119

AKL, 13, 'Bosse, Abraham': 205; *Préaud 1987*: 15–22. Henri III and Henri IV had already tried to regulate printmaking in France in 1581 and 1597 respectively, but without success; *Grivel 1994*: 39.

120

Bosse's treatise of 1645 should be seen in this light; **Bosse** (Paris 1645). See also Appendix 4, p. 419. A legal act of 15 January 1640 contained a proposal to include twenty-two items in the statutes of a guild of engravers in Paris but it failed. Many of the undersigned have Flemish names, which may mean that the proposal was based on the Flemish example; *Préaud et al. 1987*: 15–19. However, because these rules were never effectuated we do not know about the actual relations between masters and apprentices, but certain conventions would have been observed; *Join-Lambert & Préaud 2004*: 321; *Le Blanc 2004*: 101.

121

Courboin 1914: 150–151. Nevertheless, *de Gravure* was never part of the official name of the Académie and only by the end of the eighteenth century were suggestions made to include it; *McAllister Johnson 2008*. It is interesting to compare this development with Daniel Chodowiecki's frontispiece of 1778 to Carl Heinrich von Heinecken's *Dictionnaire des artistes* and Adam von Bartsch's frontispiece of 1786 for the print volumes of the Vienna court library. Chodowiecki's print shows the allegory of Painting, dressed in white and sitting in a bright light in front of an easel, looking down benevolently upon the allegory of Engraving sitting in a dark dress in Painting's shade and bent over a copper plate; *Von Heinecken 1778–1790*, 1: front. Von Bartsch's print shows the utensils for Sculpture, Painting and Engraving next to each other and of equal size; *Rieger 2007*: 33 fig. 15, cat. no. 11.

122

Gramaccini & Meier 2003: 31; *McAllister Johnson 2008*: 283; *Vasselin 2007*: 48, 89, 94, 166–167.

123

Dyson 1928: 57–58.

124

Oeconomische Encyclopädie 1773–1858, 56: 242; *Vaughan 1900*: 30–31. Monographs have been compiled on the plate printers Frederick Goulding (**Goulding** (Stirling 1910)), Peter Platt (*Hunt 1935*) and Johann D. Scherft (*Scherft 2006*, see also: *ays 1966–1967*). Obituaries: Philip McQueen (*Dyson 1989*), Robert Dutrou (*Miessner 1999*) and Aldo Crommelynck (*Miessner 2009*). The French journal *Nouvelles de l'estampe* occasionally discusses active plate printers; *Coudrain & Piza 2000*; *Laz 2008*; *2008–2009*; *Sourd 2010*. For manuals specifically on plate printing see: **Berthiaud** (Paris 1837): **Mudde** (Utrecht 1987); **Neale** (Springfield 1927); **Stijnman** (De Bilt 1985). Alan Smith was a professional plate printer who wrote a general manual on intaglio printmaking; **Smith** (Alan; Ramsbury 2004).

125

It is suggested that Gillis van Breen was printer to Hendrick Golzius, see above n. 35. Hendrick Goltzius portrayed his assistant Gillis van Breen several times in drawing and woodcut; *Bialler 1992*: 91, four portraits, plus a later discovered drawing in pen and ink in the Rijksmuseum, Amsterdam, inv. no. RP-T-2000-1. *Michael Fennitzer Kupferdrucker in Nürnberg Natus 1641*, Johann Friedrich Leonart, 1660s, mezzotint; *Hanebutt-Benz & Fehle 2009*: 143–144, cat. 55. This portrait shows the plate printer Fennitzer in formal dress, his right hand resting on a copper plate. The famous plate printer Auguste Delâtre is portrayed at his press in the frontispiece to the fifth edition of *Les graveurs du XIXe siècle*, which also discusses his work; *Beraldi 1885–1892*, V: front. The plate printer Leon Leroy, portrayed at his press, worked for Mary Cassatt in the early 1890s; *Mathews & Shapiro 1989*: 44, 61, 69–70, fig. 32. Plate printers are largely anonymous in

comparison to book printers. For example, the portrait collection of the Herzog August Library (Wolfenbüttel) has 128 portraits of book printers, but none of plate printers; *Mortzfeld 2007*: 55–56 (*Buchdrucker*). Lists of book printers were compiled long ago, including maps showing the towns in which they were active but little similar material exists concerning plate printers. *Cannon 1968*: 104–107: 105, shows a map with concentrations of book printers in London in the eighteenth century. Because in some workshops book and plate printing were combined, and because plate printers cooperated with book printers, the first plate printers would also have been found in the area. The cover of the *Gutenberg Jahrbuch 2009* lists the towns in which book printers were active in the first decades after the invention of typography. For a map of the towns in which the first Netherlandish book printers were active see: *Vijfhonderdste verjaring 1973*, map facing p. XIV. The professions 'Drucker' or 'Kupferdrucker' are not found in: *Thieme-Becker Vollmer, Gesamtregister (etc.) – Künstlerische Berufe*, München (etc.): Saur, Seemann, 1997. The professions 'Plate printer' and 'Printer' are not found in: *AKL, Biobibliographischer Index nach Berufen*, München, Leipzig: Saur, 2002–2003. Information on plate printers Auguste Delâtre, Eugène Delâtre and Frederick Goulding can be retrieved because they were also active as artists. Their professions as plate printers are only mentioned as secondary. Similarly, references to plate printing activities are found in Waller's repertory only if the person was also an engraver; *Waller 1974*. *Uebersicht 1855*: VII, gives a contemporary list of 52 towns in Germany and Austria with 197 printshops operating 616 roller presses. For the rest, lists, maps or overviews showing where and when plate printers have been active in the past are missing.

126
Sabbe 1935: 660.

127
From the associated craft of book printing it is known that working days were long and that a lot of drinking went on throughout the day to relieve the monotony; drinking was also an integral part of meetings with social and business contacts, generally held in taverns; *Cannon 1968*: 103–104. See below under 'The plate printer's workshop – Furnishing'. See also: **Gessner** (Leipzig 1740–45) 2: 192. Frederick George Hardcastle was apprenticed for seven years to the London plate printers Dixon & Ross in 1882. 'Times of attendance were from 8 a.m. to 7 p.m. for the first two years and from 9 a.m. to 7 p.m. for the remaining term. An hour for dinner and 30 minutes for tea were allowed. Work finished at 2 p.m. on a Saturday'; *Dyson 1984*: 19.

128
The regulations of German mediaeval guilds prohibited work on Sundays and holidays, although not everyone would have obeyed the rules, while working on Saturdays could be limited; *Karcher 1911*: 87. The Paris plate printers were free on Sundays and holidays; *Lespinasse 1879–1897*: 717. A note to Grand Duke Cosimo de Medici of 27 July 1619 requested payment for two plate printers who had worked during one Sunday and two nights; *Bruwaert 1914*: 843.

129
Everyone involved in the printing business celebrated *Verloren* or *Verzworen maandag*; *Sabbe 1935*: 608–609.

130
Compare this with papermakers who worked 250 days annually; *Heim 1956:* 49.

131
Statistics of Antwerp in 1834. Interiors of plate printshops nearly always show two or three workmen at the press.

132
The inventory (1630) of engraver Jan Jansz. van Doetechum documents that he owned a normal roller press and a small one; *Algemeen 1883*, 15: 2; *Alting Mees 1913-1*: 190.

133
Danckerts 1667, see the *plaatparssen* on p. 699; *Van der Waals 2006*: 205.

134
Von Zesen 1664: 215. On 28 June 1666 Allessandro Segni and Francesco Ricardi visited the famous printing and publishing house of Blaeu in Amsterdam, where they saw nine typographic presses and nine roller presses; *Van Veen 1982*: 157–158. In the fire at Blaeu's of 23 February 1672 ten (*sic*) typographic presses and four roller presses were destroyed. *Van Veen 1982*: 154. Finally, after the firm had ceased trading, three roller presses were auctioned on 7 April 1695. *Proeve 1695*: fol. D2v; *Van Eeghen 1960–1978*, 3: 24. Really large intaglio printshops appear in the nineteenth century, see above: 'Economics – A new economy'.

135
Leidsche Courant, 19 May 1730; *Van Eeghen 1960–1978*, 4: 274 and 5-I: 144.

136
Coyecque 1964, 2: 96 no. 45.

137
Le Bitouzé 1991: 38.

138
Beraldi 1885–1892, V: 171.

139
See Chapter 4, p. 334.

140
… quemadmodum tabulis aeneis imprimerentur edocuit; *Skelton 1966-1*: VI.

141
Letters from Robert W. Macbeth to Frederick Goulding, Madrid, 4 December 1887, 22 January and 25 February 1888, in: **Goulding** (Stirling 1910): 43–47.

142
'Elementary exercises with the burin', are described by Hamerton after a specimen engraved by Leopold Flameng; *Hamerton 1892*: 168–171; see Fig. 146, p. 167.

143
Tempesti (Firenze 1994).

144
Von Wilckens & Strieder 1978.

145

With exceptional talents such as Johannes and Hieronymus Wierix this leads to delusive copies after Dürer's engravings, which could easily be mistaken for originals; *Hollstein Dutch & Flemish*, 69, *The Wierix family, introduction and guide to the catalogue*: xi, xv; *Von Wilckens & Strieder 1978*: 25, 111, 117, 163.

146

Boschloo 1989: 273.

147

For comparison with the training of painters see: *Boschloo 1989*: 268–277.

148

Gramaccini & Meyer 2003: 34. Tempesti came from Florence to Paris in 1676 and Spanish engravers also went to Paris to continue their studies in the eighteenth century; see below, p. 89. German engraver Johann Georg Wille made his fame in Paris and trained apprentices of eight different nationalities; *Courboin 1914*: 20. Among those elected to membership of the Académie Royale de Peinture et de Sculpture between 1655 and 1789 were engravers from Denmark, Germany, Italy, Spain and the southern Netherlands; *Préaud 1982*.

149

Berthiaud (Paris 1837).

150

Ibid., 218–219.

151

Van Dillen 1929: 711 no. 1191. It is not known what this 'invention' could be. For other references to David de Meyne (also Meine or Meyn) see: *Van Dillen 1933*: nos. 464, 597.

152

Note that Bosse, in the introduction to his treatise, first directs himself *Aux Amateurs*, before addressing the professionals in his field (*ceux qui y excellent*); **Bosse** (Paris 1645): [1]–[3], pl. [1], of the introduction.

153

Prints 1996: 629–630; *Rosenbaum 2010*, keywords in subject index *Mezzotinto* and *Radierung*; *Vasselin 2007*: 121–123. Maria de Medici, Queen of France, made a woodcut when she was 14 years old in 1587 (*Maria Medici.F. .MDLXXXVII.*); *Harvey-Lee 1995*, cat. no. [2]. Jean de Beaugrand, secretary to the king and his libraries, studied engraving for two hours per day during three months with Simon Frisius in May–July 1600, ordering a roller press on 19 June 1600; *Grivel 1994*: 41–42; *Meyer 2006*: 264. Constantijn Huygens the Elder, a high-ranking Dutch diplomat, etched in his spare time; **Huygens** (1640): fol. 14r. Böckler, who translated Bosse's manual, says he had done a little etching ([*ich habe mich*] *in dergleichen etwas geübet und beflissen*); **Bosse** (Nürnberg 1652): fol. A7r–v. John Evelyn mentioned that the French king Louis XIV etched and the earl of Sandwich engraved, while he himself was a practising etcher; *Aspital 1980*: xiii; **Evelyn** (London 1662): 131. Queen Christina of Sweden seems to have made engravings; *Hollstein German*, 5, 'Christina': 192. Dutch Stadholder Prince Willem II etched for leisure; *Waller 1974*: 364. Friedrich II the Great of Prussia, Marie Antoinette of France, and Queen Victoria and Prince Albert of England etched for a hobby; **Ashley** (London 1849): III; **Burnet** (1849): 5; **Castle** (London 1849): 3–4; *Craig 1821*: 385. The success of the Société des Aqua-fortistes was due in no small part to the interest of royalty from Portugal and Sweden, as well as amateurs from the higher French social classes; *Cadart & Luquet 1865*: 48–50; **Lalanne** (New York 1981): X. See the entries *Brunsvicensien 7* and *Dilettantengraphik* (*fürstliche*) in the printroom of the Herzog Anton Ulrich-Museum, Braunschweig, referring to amateur works, largely produced by nobility, of the seventeenth, eighteenth and nineteenth centuries. Search for 'Dilettantengraphik' in the database of the *Virtuelles Kupferstichkabinett*; http://www.virtuelles-kupferstichkabinett.de (2010).

154

Ashley (London 1849): III: this manual is written especially for women. **Bayard** (Paris 1901): [6]: offering courses in making *cellulotypies* for women. Tiquet addresses himself to the 'Ladies who, as a hobby, would like to do some etching themselves'; **Tiquet** (Antwerpen 1741): 89. This is similar to Hassell who also meant his book for 'those ladies who pursue the Fine Arts as an amusement'; **Hassell 2** (London 1826): 5. Practical art courses, including etching and lithography, were offered by the Malerinnen-Schule zu Karlsruhe; *Katalog Karlsruhe 1905*: 100. At the founding meeting of the Société des Aqua-fortistes Charles Baudelaire reminisced that 'in the good old days of the Etching Club, […] the ladies themselves were proud to venture an untaught needle across the varnish'; Charles Baudelaire, 'Peintres et aquafortistes', in: *Le Boulevard*, (14 September 1862), quoted from *Ecrits sur l'art*, Paris: Librairie Générale Française, 1999: 461–467.

155

Browne 1 (London 1660); **Browne 2** (London 1669). One of his pupils was the wife of Samuel Pepys to whom he offered a copy of his book: 'Presented this day by Mr. Browne with a book of drawing by him, lately printed, which cost me 20s to him'; *Latham & Matthews 1970–1983*, 9: 561 (27 May 1669). The book was published at 10s bound.

156

Fielding (New York 1880): 201–258; **Le Comte** (Paris 1699–1700) 1: 138–156 (front); **Orlandi** (Napoli 1733): 58; **Sandrart** (Nürnberg 1675–1679) 1, book 2: 49–52. As already mentioned, John Evelyn intended to add his translation of Bosse's monograph to *Sculptura*, but refrained from doing so when he heard about Faithorne's translation; **Evelyn** (London 1662): [1] at the back. The anonymous author of 'Sculptura-historico-technica' explains why he wrote about the technical aspects of etching: '… For the Benefit of those, who either profess the Art, or desire to learn it, he has also added, "Directions for Ingravers", selected from the [p. iv] best and most approved Writers on the Subject, which will be also very serviceable to all Gentlemen, who make Collections, by enabling them to judge of the Goodness and Beauty of Prints'; **Sculptura-historico-technica** (London 1747): iii–iv.

157

Von Bartsch 1821, 1: VII–VIII, 1–47. Bartsch explained all processes correctly and in detail. Missing, however, are specimens illustrating the different methods, making everything rather abstract for those who have not seen or practised the processes.

158

See Chapter 3, p. 191.

159

Evelyn (London 1662): 145–148, esp. pp. 147–148. 'I did not think it necessary that an *Art* so curious, and (as yet) so little vulgar (and which indeed does not succeed where the *Workman* is not an accomplished *Designer*, and has a competent talent in *painting* likewise) was to be

prostituted at so cheap a rate, as the more naked describing of it here, would too soon have expos'd it to.' For the development of the mezzotint technique, see Chapter 3, p. 184.

160

Boschloo 1989: 11–12.

161

Academy or *The Practice of the Visual Arts*, Cornelis Cort after Johannes Stradanus, 1578, engraving; the drawing by Stradanus is dated 1573; *New Hollstein Dutch & Flemish*, 'Cornelis Cort', III: 118–119.

162

Boschloo 1989: 14.

163

For a quick overview see: *Mayer 1987*: 22–23.

164

Boschloo 1989: 33 (Bologna 1582): 33–34 (Rome 1593): 44 (Milan 1620); *AKL*, 57, 'Goltzius, Hendrick': 408–409, Karel van Mander, Cornelis Cornelisz and Hendrick Goltzius together formed a kind of art academy; *Delaborde 1891*: 9; *Hunnisett 1998*: 308; *Lamb 1935*: 11; *Levend kunstonderwijs 1957*: 1; *Pauwels et al. 1987*; *Pevsner 1940*; *Vitet 1861*: 63, 208–220. The Académie Royale de Peinture et Sculpture (est.1648) opened its doors to engravers in 1655 with the intention that the best engravers should reproduce the works of their fellow painters and sculptors, but it was never a training institution; *Boschloo 1989*: 187; *Gramaccini & Meier 2003*: 31; *McAllister Johnson 2008*: 283; *Préaud 1982*; *Vitet 1861*: 404. Teaching at the adjoining École Royale de Peinture et de Sculpture was limited to drawing only (Wikipedia, German version). See above concerning the independence of Paris engravers and the acceptance of engravers to the Académie.

165

The Jesuits organised a kind of art school within their seminaries in Japan in the period 1590–1614, with 23 pupils in 1592 and 14 in 1601; *Jennes 1943*: 132–137. Training included studying Western oil painting and engraving techniques. The intention was to prepare local artists for the production of imagery for proselytising purposes. Interesting for our discussion is that it was more of a school than a master-apprentice system with contracts and guild regulations. See also Chapter 1, p. 59. The Jesuits also taught copper engraving to native Americans in Paraguay in the eighteenth century see Chapter 1, p. 64.

166

Two forerunners are a school in Toulouse and the engraving school at the French Gobelins manufactory (est.1667); *Vasselin 2007*: 93. For the Academy of San Fernando see: http://rabasf.insde.es/ (2010).

167

Caveda 1867: 247, 250–251, 259; *Vega 1989*: 92–95. Palomino taught at his own house because of lack of space in the academy building, as did Jose de Madazo who taught classes in colour and painting. I am grateful to Elena Cenalmor for this information.

168

Hunnisett 1998: 320; *Vega 1989*: 90–91. Mexico City in 1784; *Carrillo y Gariel 1982*: 5–6; *Donahue-Wallace 2006*: 148.

169

St. Petersburg in c.1760 by Georg Friedrich Schmidt (1712–1775); *Hind 1963-1*: 204. Leipzig in 1764; *Zweihundert 1964*: 9, 12. Stockholm in 1766; *Wiebel 2008*: 122. Vienna in 1766; *Boschloo 1989*: 381; *Durstmüller & Frank 1982–1988*, 1: 185; *Hunnisett 1998*: 305, 320–321. Lisbon in 1768; *Jatta & Leme 1996*: 13. Rome in 1780 by Giovanni Volpato (1733–1803); *Hind 1963-1*: 209; *Thieme-Becker*, 34, 'Volpato, Giovanni': 530. Florence in 1793 by Raphael Morghen (1758–1833); *Hind 1963-1*: 209; http://www.newadvent.org/cathen/10568b.htm (2010); *Thieme-Becker*, 25, 'Morgen, Raphael': 250. German *Kupferstichschule* are found in Berlin, Breslau, Düsseldorf, Königsberg, Mannheim, Stütgart and Wilna, among others.

170

Two Koninklijke academies were established in the new Kingdom of the Netherlands in Antwerp and Amsterdam in 1820, both academies were to offer courses in engraving with Amsterdam also offering etching; *Derkinderen 1908*: 12; *Reynaerts 2001*: 10, 57, 104. The Ecole Royale de Gravure in Brussels was established in the same year, but started courses only in 1836; it was merged with the Brussels Koninklijke Academie in 1848; *Hind 1963-1*: 210; *Mayer 1987*: 32. An engraving school was established in Dresden in 1764, but apparently engraving schools no longer existed in Germany by around 1900; *Boschloo 1989*: 356, 358; *Zweihundert 1964*: 9, 12.

171

Hunnisett 1980: 69. The lack of courses in drawing at London institutions would have been compensated for by private initiatives of apprentice engravers and because the capital attracted the most ambitious pupils. Hamerton advised the beginner to first study drawing or painting before trying his hand at etching; **Hamerton** (London 1871): 57–60.

172

Plantenga 1938: 84; *Stuers 1878*, especially pp. 51, 401–416, but without information on etching classes.

173

Cate & Grivel 1992: 184; **Lalanne** (Paris 1866): 83.

174

Hind 1963-1: 319; *Stuers 1878*: 25, 39, 45.

175

Goulding (Stirling 1910): 37.

176

Hind 1963-1: 330; *Short 1904*, the collection was prepared by Miss C.M. Pott.

177

Bailly-Herzberg 1972, 1: 37–51 (esp. p. 42), 259, preface to the first portfolio (1863) of the Société des Aqua-fortistes by Théophile Gautier on pp. 266–267. Some earlier nineteenth-century organisations had already encouraged etching, such as the Apollo Association for the Promotion of the Fine Arts in New York City (1839), the Etching Club (1840) in London and the Haagsche Etsclub in The Hague (1848).

178

Potémont 1 (Paris 1864); **Potémont 2** (Paris 1873).

179

Lalanne (Paris 1878): 1–3. Bosse's treatise had become out of date and Lalanne's manual filled the gap; *Bailly-Herzberg 1972*, 1: 272–273. See Appendix 4, p. 421.

180

Delâtre (Paris 1887).

181

Cadart sailed to New York in 1865/1866 to exhibit modern paintings and prints, also carrying a large amount of etching equipment. He claimed that his mission was successful and that etching clubs sprang up in New York, Philadelphia and Boston. Actually it was more modest, although Samuel Putnam Avery travelled to Paris to buy prints there in 1866; *Bailly-Herzberg 1972*: 211–213, 273, and see below; *Schaar & Hopp 1977*: 51; *Schneider 1982*. The Société des Aqua-fortistes was followed by a succession of other French groups and societies of printmakers up to the present day; *Aliadière et al. 2005–2006*; *Melot 2005–2006*: 12–22; *Vazelle et al. 2005–2006*. New societies of etchers flourished in other European countries from the 1870s, the first being the Société Internationale des Aqua-fortistes (1875) founded by Felicien Rops in Brussels, who later also had an interest in the Société des Aqua-fortistes Belges (1887); *Hind 1963-1*: 335. In 1876 came the Weimar Gesellschaft für Radierkunst; *Prints 1996*: 629. English members of the Société des Aqua-fortistes founded their own Society of Painter-Etchers in London in 1880; **Chattock 2** (1881): 17; **Herkomer** (London 1892): 12–13. The popularity of etching in Germany is evidenced by the etching portfolios published by the Vereine für Original-Radierung in Berlin, München and Karlsruhe in the 1880s and 1890s; *Hind 1963-1*: 336; *Katalog Karlsruhe 1905*. Other German etching societies were founded in Düsseldorf and Weimar. Similar groups included the French Etching Club in New York (est.1866) and the New York Etchers Club (est.1877) with members related to the Société des Aqua-fortistes or the Society of Painter-Etchers; *Bailly-Herzberg 1972*: 214; *Cadart & Luquet 1865*: 18–20; **Chattock 2** (1881): 17; *Hind 1963-1:* 333; **Lalanne** (New York 1981): xi–xiii. The Cincinnati Etchers Club (mainly amateurs) and The Boston Etchers Club were founded in 1879 and 1880 respectively; **Lalanne** (Boston 1880): 63. Many more such groups appeared in the USA after; *Prints 1996*: 628–629. http://en.wikipedia.org/wiki/California_Society_of_Printmakers (2010); http://en.wikipedia.org/wiki/American_print_clubs (2010). For 'The Royal Society of Painter-Printmakers' see: http://artmondo.net/printworks/workshops/re.htm (2010). The Société des Aqua-fortistes was followed in France by the Société des Peintres-Graveurs only in 1889.

182

Derkinderen 1908: 27; *Reynaerts 2001*: 239.

183

Reynaerts 2001: 242.

184

Giltay 1977: 91, 92, 96; **Hamerton** (London 1871); **Lalanne** (Paris 1866); *Zilcken 1902*: 304.

185

The idea for Lalanne's manual may have come from Barbara van Houten, who earlier had studied etching in Paris using this manual.

186

Chattock (1880–1882); **Chattock** (London 1882); **Haden 1** (1866); **Haden 2** (1882); **Hamerton** (London 1871); **Herkomer** (London, New York 1892); **Menpes** (1889); **Menpes** (1890); **Robertson** (London 1883); *Society 1881*.

187

He stayed from November 1854 to February 1855; *Cadart & Luquet 1865*: 20; *Naylor 1975*: vii.

188

Burnet (1849); **Chattock** (1880–1882); **Haden 1** (1866); **Hamerton 1** (1866); **Hamerton 2** (1870); **Hamerton 3** (1875); **Hunt** (1850); **Menpes 1** (1889); **Menpes 2** (1890); **New applications of electricity** (1860); **New method of etching** (1849); **Paton** (1892–1894); **Plate printing** (1849); **Process of hardening** (1858); **Steel on copper-plates** (1858).

189

Boutet (Paris c.1890): [2] at the back.

190

Atelier 17 1993; *Black & Moorhead 1992*: 9, 13, 15.

191

See Appendix 4, p. 421.

192

Cate & Grivel 1992: 176; **Hayter** (London 1949): 207; **Hecht** (1994): 25, 29. In Hayter's words: 'the interdependence of technique and idea is a condition without which idea is lost and technique is a sterile, mechanical operation'; **Hayter** (New York 1981): 5–6; *Hayter 1975*: 91–94. The studio continued in Paris as Atelier Contrepoint (since Hayter's death in 1988) and still offers courses according to Hayter's principles and techniques; *Black & Moorhead 1992*: 391; http://www.ateliercontrepoint.com/a172.html (2010).

193

Derkzen van Angeren 1930; **Lankes** (New York 1936).

194

Rothe 1 (Wien 1925). Linocut became popular in this period, too.

195

The use of *Preßspan* was Richard Rothe's idea. Oswald Zwiener opted for linoleum, while Bruno Zwiener suggested nickel-zinc as a cheap substitute for copper; **Rothe 2** (Wien 1929); **Zwiener** (Bruno; Mühldorf 1928); **Zwiener** (München 1920).

196

Andrews (Englewood Cliffs 1964), 'elementary, high school, and recreation art programs'. **Fricke** (Köln 1984), *Die fünf Folgen der Fernsehreihe 'Graphische Drucktechniken, auf der dieses Buch basiert, wurden im Frühjahr 1982 in der Staatlichen Kunstakademie Düsseldorf gedreht. Die Aufnahmen zu diesem Begleitbuch entstanden während der Dreharbeiten*. **Gilmour** (London 1981), 'Published to accompany the BBC Continuing Education Television Series "Artists in Print" produced by Suzanne Davies. First broadcast on BBC-2 on Monday from 9 March 1981. Published to accompany a series of programmes prepared in consultation with the BBC Continuing Education Advisory Council'. **Ginkel 2** (Utrecht 1985), coursebook accompanying radio and television lessons, the courses were also available on audio and videocassettes. *Rutten & Bulte 2009*, concerns a Dutch studio for children's education aimed at practical art classes for

immigrant children.

197

For a discussion on the meaning of manuals see Appendix 4, p. 419. References to intended audiences are referred to in the annotations to the title descriptions in the bibliographical descriptions. Some of the instructive handbooks for gold- and silversmiths published in the twentieth century also discuss engraving for printmaking; **G.A.B.** (London 191?); **Hilpke** (Stuttgart 1956); **Hübener** (Leipzig 1916); **Streubel** (Leipzig 1955).

198

Burnet (1849).

199

Note that loose articles of encyclopaedias, which were often published in instalments, do exist and that some artists apparently had access to encyclopaedias. Stapart derived and quoted his information about the preparation of the copper plate, the etching ground and printing from articles on the subject in the *Encyclopédie*, including the mistakes; *Diderot & D'Alembert*, 7, 'Gravure': 877, 879, 'Imprimerie en taille douce', 8: 607–623; **Stapart** (Paris 1773): 14–23 (on the copper plate), 23–40 (on the etching ground), 82–83 (on printing). When Alexander Anderson, well known as America's first wood engraver, wanted to learn etching, engraving, mezzotint and aquatint, he had to teach himself from an encyclopedia; *Larson 1982*: 50–51. Japanese etcher Shiba Kôkan claimed that he had learned etching and intaglio printing with the help of a Dutch encyclopaedia, which could have been *Chomel 1778* (or an earlier edition) or *Buys 1769–1778*; *French 1974*: 42–43.

200

The articles in the *Encyclopédie* on etching and intaglio printing are, with some misinterpretations, edited after the works by **Bosse** (Paris 1745) and *Felibien 1699*; *Diderot & D'Alembert 1751–1781*, 7: 877–899, 'Gravure', especially p. 899; 8: 607–623, 'Imprimerie en taille douce', especially p. 621. The article on colour printing and mezzotint is an abbreviated version of part 2 of **Le Blon** (Paris 1756); *Diderot & D'Alembert 1751–1781*, 7: 899–903, esp. pp. 899 and 903. Krünitz copied the integral text of **Tischbein** (Cassel 1790); **Tischbein** (Berlin 1792): 421–458. Similarly, the item 'Etching' in the *Lexicon technicum* gives as reference 'Brown's Ars Pictoria'; **Browne 2** (London 1769); *Harris 1704–1710*: item ETCHING. The text on the aquatint technique by Jean Baptiste Le Prince (1734–1781) was never printed in his lifetime, but published in the *Encyclopédie méthodique* posthumously; **Le Prince** (Paris 1788).

201

See Chapter 3, p. 198. The use of an *échoppe* is not observed in illustrations in any of the translations of his manual.

202

Bosse (Paris 1645): 33–34, pl. 8.

203

Hamerton (London 1871); **Herkomer** (London 1892); **Hubbard 1** (London 1920); **Hubbard 2** (Woodgreen Common 1923); **Lalanne** (Paris 1866); **Ligeron** (Paris 1923), with prints in colour; **Lumsden** (London 1925), only the de-luxe edition has original prints; **Paton** (London 1895), the 2nd ed. has prints in colour; **Poortenaar** (Amsterdam 1930), including one plate with specimens accompanying p. xvi, some prints in colour, the second edition contains reproductions of the specimens while the third and fourth editions revert to originals; **Potémont 2** (Paris 1873), only the first French edition has original prints – all later editions contain reproductions; **Reed** (New York 1914); **Robertson** (Henry Robert; London 1883).

204

Van der Meulen 1897: 277 (see Fig. 86); *Michel 1906*: 557–558. Reproductions of any kind are not under discussion here.

205

West (London 1932) is the only manual with actual photographs tipped in (see Fig. 17, p. 19). **Lankes** (New York 1936) and **Skrbek** (Praha 1937) are the first manuals illustrated with photographs printed from dot-screen autotype blocks.

206

Heller (New York, 3rd ed., 1972): 332, with a list of 'films related to prints and printmakers'. Some manuals contain or are published together with audiovisual information media: **Brooks** (San Francisco 2007); **Brown** (San Francisco 2006); **Ginkel 2** (Utrecht 1985).

207

Some examples are: *Degaast & Frot 1934*; *Klimschs Jahrbuch, eine Übersicht über die Fortschritte aus graphischem Gebiete*, 1 (1900)–33 (1940); *Krüger 1914*, with an extended edition in 1929; *Stiebner et al. 1978*. Concerning publications on recognising printmaking techniques see Introduction, p. 14.

208

Mudde (Utrecht 1987); **Smith** (Paul; Sydney 1983).

209

Andringa 2005; *Brett 1999*; **D'Arcy Hughes** & **Vernon-Morris** (2008): 9–10; *Education 1994, 1995-1, 1995-2, 1995-3, 1995-4, Kowalsky 1999*; *Mumberson 1998, 1999, 2000*; *O'Hanlon 1998*; *Santos 1998*; **Zaffron 2** (1996). http://www.electroetch.com/resp1.htm (2010), which concerned the closure of the printmaking facility in the New School in New York, where Stanley Hayter had started his Studio 17 in 1940 and from where the wave of modern printmaking in the USA began. With thanks to the members of the Yahoo SSNW and MTSU Printmaking Links forums for discussing this topic in 2006 and 2007.

210

For comparison, see Papillon's detailed working conditions for the woodcutter; *Papillon 1766*, 2: 78–79.

211

Mayer 1984: 224, upper illustration: *Kunst-zimmer. Conclave Artificis. Kunst Zimmer sind bestimmt zu sinnen und studieren, und werden nach dem Licht vornehmlich außgewählt; Was der Kopf inventirt, muß dann die Hand ausführen, Das es auf Fleiß und Kunst an Gut und Ruhm nicht fehlt.*

212

Deleschamps (Paris 1836): 88; **Perrot** (Paris 1830): 23.

213

Von Bartsch 1821, I: 7.

214

Tempesti (Firenze 1994): 132. Northern light is generally preferred for studios, such as by Adam von Bartsch (1821); *Von Bartsch 1821*, I: 7. For comparison with the preferred working hours of a woodcutter see: *Papillon 1766*, 2: 79.

215

Merrifield 1849: lxxvi, lxxx–lxxxi, cclxxxiii n. 3, 339, 492–493. Special screens for scribes are documented; *Brack 1485*: fol. XLIIIIv (*Antipita / L(e)uchtsschirm, Absconsorium / liechtschirm*).

216

Beal 1984: 230. One may imagine the smell when the hog's grease became rancid after a while.

217

Similarly, a draughtsman preferred a studio with northern light, but if directed to the south the windows should be covered with oiled paper or thin linen cloth to diffuse the sunlight; *Goeree 1668*: 24–25.

218

Note that the screen is drawn in masterful control of perspective, Bosse's speciality. A screen with a similar function is seen in a design of a studio of a *Graveur à l'eau-forte* for a Sèvres porcelain dish by Jean-Charles Develly of 1827; *Fairclough 1994*: 415, fig. 226.

219

*Il luy faut en ce lieu une espece d'*Abat-jour *c'est a dire un grand chassis de papier net et transparent, ou du moins huillé a la maniere des chassis communs*; **Filleau des Billettes** (Paris 1693–1698): 113, pl. [1] above, where the engraver is shown with a sash between him and the window and fig. B that shows the sash itself.

220

Artist's assistant (London, 2nd ed., 1785?): 199, after **Bowles**; **Bowles** (London 1760?): 30; *Diderot & D'Alembert 1751–1781*, 'Receuil de planches' (etc.), 4me [= 5th vol.], 'Gravure, en taille-douce' (etc.): 1 pl. I fig. 3-l and 6 pl. V fig. 6; **Fraipoint** (Paris 1897): 4; *Merrifield 1967*: lxxvii; **Schoonebeek** (Amsterdam 1698): 20. **Francis** (1842) 3: 383–384, remarks that a sash is necessary for engravers, not for etchers who can easily see what is etched. The bookseller John Garret offered 'several sorts of Coloured Sashes to set before Windows', for private use only and not for use in an engraver's studio; **Book of drawing** (London 1705), titlep.; **Book of drawing** (London 1710), titlep.

221

Fokke (Dordrecht 1796): 286–287.

222

Ackermann sold lamps to engravers; **Fielding** (London 1841): [1] of Ackermann's catalogue of artists' supplies.

223

Filleau des Billettes (Paris 1693–1698): 116, pl. [1] fig. C; *Diderot & D'Alembert 1751–1781*, 'Receuil de planches' (etc.), 4me livraison [= 5th vol.] (1767), 'Gravure, en taille-douce' (etc.): 6, pl. V fig. 7; the same in **Fokke** (Dordrecht 1796): 284–285, fig. 8, pl. VIII, fig. 8. *Buriniste travaillant à la lampe*, De Lorraine after Bauvais, shows engraving by the light from an oil lamp without using any kind of screen; *Courboin 1914*: pl. 12 opp. p. 38.

224

Entry for 7 October 1664; *Latham & Matthews 1970–1983*, 5: 291; *Levis 1915*: 57. On 10 August 1664 Pepys mentioned the mathematician and writing master Edward Cocker who engraved tables for him 'upon my new sliding rule with silver plates'. Thus not a printing plate, but his notes document the use of a glass ball (filled with a liquid) to concentrate artificial light on his work and a screen of oiled paper to filter it again; *Latham & Matthews 1970–1983*, 5: 237, 290–292. Pepys's eyesight was failing and he therefore did not need the glass ball and screen for engraving, but 'to help my eyes by Candle light'; *Latham & Matthews 1970–1983*, 5: 290.

225

Diderot & D'Alembert 1751–1781, 'Receuil de planches' (etc.), 4me livraison [= 5th vol.] (1767), 'Gravure, en taille-douce' (etc.), 'Gravure en cachets': pl. I, fig. 4, *Bocal servant à graver le soir*. Luyken's plate of a goldsmith's workshop perhaps shows a glass globe on the left of the working bench; *Luyken 1694*: pl. 79. *Papillon 1766*, 2: 73, *bocal*. **Querfurt** (Wien 1792): 27. This glass globe was used by cutters of woodblocks in the eighteenth century and by copper and wood engravers in the nineteenth century; **Deleschamps** (Paris 1836): pl. 1; *Jackson 1839*: 651–652; **Šimon** (Praha 1921), frontispiece. I observed the use of glass globes filled with water by modern Japanese woodcut artists working in traditional style *moku-hanga*. Normally clear water was used, but Fielding referred to a French letter engraver who used a blue solution; **Fielding** (London 1841): 75–76. Nineteenth-century wood engravers filled the glass globe with a diluted blue copper sulphate solution; **Chapman** (New York, new ed., 1870): 278; information kindly supplied by Johan de Zoete.

226

Chapman (New York, new ed., 1870): 278.

227

Stuers 1878: 48, 84. James McBey, *Selfportrait in his studio*, etching, 1914, see: *Verhaak 1990*: fig. 21. Lighting by mineral oil was considered as it gives a whiter light with less adulteration, but the fire hazard was too great.

228

Stuers 1878: 84.

229

Paton (London 1895): 180, the use of gaslight is depicted in his illustration of an *Etcher's Studio*: pl. opp. p. 180.

230

Jurkiewicz (Kraków 1938), fig. on front cover.

231

Mayer 1984: 224. The *'Kunstkamer'*, Cornelis Ploos van Amstel, 1758, drawing, in: *Laurentius 1980*: 103. **Villon** (Paris, nouv. ed., 1914) 1: 34.

232

See Chapter 3, p. 198 and Chapter 4, p. 313. Basically the stoves and hotplates are the same as those used in wiping the printing plates and modern suppliers do not differentiate between the two.

233

Bosse (Paris 1645): 44. Paton advises the artist-etcher to wear 'an old suit of clothes, or an apron with a bib to cover the breast'; **Paton** (1892–1893): 50.

234

Baltar (Paris 1998): 4, the engraver Bonvin is depicted wearing an eye shade (c.1860–1870); *Fairclough 1994*: 415, fig. 226, the engraver is wearing a cap with a wide brim (1827); *Verhaak 1990*, fig. 15, the man on the right is wearing a cap with a brim (c.1815). Perhaps the engraver's hat with the brim extended in Kilian's printshop interior of 1620 can be interpreted like this (see Fig. 78). Several other interiors of engravers' studios show engravers wearing hats or caps with wide brims.

235

Fokke (Dordrecht 1796): 187–188, pl. VI, see the semicircles cut out of the engravers' desks.

236

For further details on tools and supports see Chapter 3, p. 164.

237

For further details on tools see Chapter 3, p. 199.

238

Bosse (Paris 1645): 22. **Excellency** (London 1668), see the figure in the upper right of the title page. Rembrandt depicted himself drawing a plate in an etching of 1658, the plate is resting on some form of support and he holds it slightly tilted; *Hollstein Dutch & Flemish*, 18: 169, S 379 and 19: 282, S 379.

239

Bosse (Paris 1645): 33, 44; *Papillon 1766*, 2: 79; *Stijnman 1999*: 33, fig. 13. Merian shows a man working at a table easel, too, but he is clearly drawing and not engraving (see Fig. 11, p. 12). For further supports used in engraving see Chapter 3, p. 169.

240

Longhi (1793), Tav. X, pag. 374.

241

Reference to Longhi's article in the *Oeconomische Courant 1799–1803*, 2 (113) (Nieuwe uitvindingen): 70. His design was copied until the beginning of the twentieth century, but whether it was used in actual practice is doubtful; **Deleschamps** (Paris 1836): 88: pl. 1; **Partington** (London c.1825): 102; **Perrot** (Paris 1830): 23–24, pl. I, fig. 1; **Perrot** (Ilmenau 1831): 62 and 65 figs 7–9; **Perrot** (Paris 1865): 19 pl. 1 fig. 1; **Villon** (Paris 1894, 2nd ed., 1914) 1: 31–33 fig. 14 (after Perrot). Slanting desks are occasionally depicted in nineteenth-century engraver's interiors, although a turntop desk is nowhere to be seen; **Ashley** (London 1849): pl. 1, fig. 10; **Baltar** (Paris 1998): 4, *Portrait de Bonvin, par Courtry*; **Chapman** (New York 1870): 256; *Fairclough 1994*: 415 fig. 226; **Melis-Marini** (Milano, 2nd ed., 1924): tav. II fig. a.

242

The original drawing of 1573 shows a proof on the working bench whereas the print of 1578 shows a leaf with the words *Typorum encorum INCISORIA*.

243

Similar stands can be seen in plate 4 of Stradanus's *Nova Reperta* on book printing. Here they are used by typesetters to hold up the manuscripts to be set.

244

Excellency (London 1668), frontispiece, upper right image; *Fairclough 1994*: 415 fig. 226; *Perspective practique 1642–1647*, 1: [9], [17] and, 2: [11] front, see the illustration with seven professions with the engraver second from the right.

245

This concerns a settlement between engraver and plate printer Hendrik Terbrugghen at Malines and Engele Henrickx, wife of Jan de Cock, a book printer from Antwerp; *Van der Stock 1998*: 337–339. Older roller presses are known – not for use in printing, but for calandering textile cloth and flattening strips of brass or tin. For the historical development of the roller press see Chapter 4, p. 287.

246

Landau & Parshall 1994: 20; *Van der Coelen* 1995: 122; *Van der Stock*: 350, 354.

247

On 24 May 1595 Pieter Bailly received permission from the curators of the university and the mayors of Leyden to insert a couple of windows in the roof of his house in order to install a roller press in the attic and thus run a printshop there; *Molhuysen 1913*: 93.

248

The 1544 inventory of Cornelis Bos shows he had two presses in the attic of his Antwerp house, one for printing woodcuts and another incomplete one possibly for printing engravings; *Van der Stock 1998*: 350, 354, 362. In the 1550s Ippolito Salviani probably installed a roller press in his house in Rome to print the plates for his *Aquatilium animalium historiae* (1554–1558); *Bury 2001*: 125; *Mortimer 1974*, II: 629–632 no. 455. For engravers/plate printers working at home in Paris in 1566 see: *Bimbenet-Privat & Le Bars 1994*.

249

Sambucus 1566: 247; for a discussion of the apparatus in this illustration see Chapter 4, p. 288.

250

Stijnman 2010-2.

251

Bruwaert 1914: 841–842.

252

Tempesti (Firenze 1994): 165.

253

Bosse (Paris 1645): 63–64.

254

The different elements look realistic, but the whole picture is composed carefully; see for example the impossible position of the man in the middle at an extra table away from the window and his back aligning parallel to the arm of the cross of the press.

255

The wooden press underwent a number of improvements in order to reduce resistance in operating the machine until the introduction of gearings that solved this problem. But, although there is no longer a need for it because modern presses turn smoothly, even in relatively modern pictures the printer is sometimes shown pulling with both hands and pushing with a foot to turn the cross of the press to create

some kind of romantic imagery (see Fig. 17, p. 19). For further details on the development of the roller press see Chapter 4, p. 287.

256
Bosse (Paris 1645): 70–71.

257
'An overall of some sort will be required. I get along very well with a white jacket such as a dentist wears, the sleeves being permanently rolled up', otherwise a full length overall is advised; **Strang** (David; London 1930): 98.

258
Stuers 1878: 48.

259
Eder 1922: 78–79; *Michel 1906*: 557, 558; *Van der Meulen 1897*: 277. A window covered with some kind of vellum can be observed in: **Bosse** (Paris 1745): pl. 19 (see Fig. 226, p. 285).

260
Dyson 1984: 84–85.

261
L'Établissement photographique de MM. Goupil et Cie, à Asnières, taken from *L'Illustration,* see: *Béguin 1998*: 125, fig. below right. *Eder 1922*: 78–79; *Michel 1906*: 557, 558; **Profit** (Paris 1913): 109.

262
Ergon 1987, fig. on p. 106; **Jurkiewicz** (Kraków 1938), fig. on front cover; **Strang** (David; London 1930): 17.

263
Berthiaud (Paris 1837): 219, mentions that the apprentice lights the stove which heats the printshop in wintertime. Authors took heating the room for granted so there would be no necessity to mention it in handbooks on printmaking. Most modern Western studios are heated by a central heating system; until recently Japanese studios were often heated by a kerosene burner. Gas or electric heaters are now used.

264
The same stove is used for grounding the plate. A stove is more effective as a heat source in a printshop where it burns continuously. See Chapter 3, p. 198 and Chapter 4, p. 313.

265
Dyson 1984: 85.

266
Ramshaw (1819). This text is largely copied in **Hansard** (1825), in the note on pp. 802–803.

267
Ramshaw (1819): 96. Not to mention the ashes that may contaminate the ink or the freshly pulled impressions, thus spoiling the print. Berthiaud mentioned heating the stove with steam, which he might have seen in Ramshaw's printshop during his studies in London; **Berthiaud** (Paris 1837): 269–272: pl. 3 fig. 2.

268
Rauch (1843). A hotplate similar to Rauch's description is probably seen in the interior of the printshop of W.B. McQueen (see Fig. 87).

269
Goulding (Stirling 1910): 77; *Hughes & Kimber 1880*: 114; *1885*: 20; **Paton** (London, 2nd ed., 1909): 166–167, pl. opp. p. 180. **Hamerton** (London 1881): 86: 'Gas is best, in its absence any kind of [oil] lamp will answer the purpose. French printers commonly use charcoal under ashes.'

270
Lumsden (London 1925): 64, refers to an electric heater in 1908; *Pennell 1936*: 205, 'electric heater is far the best'; **Strang** (David; London 1930): 18, mentions that 'electric heating' is still expensive.

271
Both gas and electricity as heat sources are mentioned by: **Chamberlain** (London 1972): 41; **Hayter** (London 1949): 120; **Ross & Romano** (New York, 2nd ed., 1990): 90; **Verbruggen** (Amsterdam 1981): 37–40. Gas heating is still documented in: **Kätelhöhn** (Möhnesee 1998): 67 pl. on inside front cover; **Smith** (Alan; Ramsbury 2004): pl. on pp. 115–116. The advantage of gas heating is that it can be regulated instantly, while electric hotplates react more slowly.

272
Bosse (Paris 1645): 64 pl. 16 no. C.

273
Luyken's printshop interior shows the use of laths for drying prints underneath the ceiling. Laths are called *stokken* in *Proeve 1695*: fol. D2r. Ropes have the disadvantage that they sag; *Schauplatz 1774–1783*, 1 (1774): pl. accompanying no. 10.

274
Krünitz 1792: 240.

275
Cf. *Cannon 1968*: 103–104. See above under 'Plate printers – Working hours'.

276
Bury 2001: 227.

277
Van der Venne's printer's device of 1625 with the text *Pictoribus atque poetis, Cunst en Boeck-druckery* (For painters and poets, art (= plate) and book printshop) shows a typographic and a roller press (see Fig. 65). Van der Venne died in 1625 and his widow used the device in that and the following year. The same mark or its copies were used by Adriaen van de Venne & Joost Ockers (1628, 1632), Anthony Jansz Tongerloo (1630) and Zacharias Roman (1659), but they are not recorded as plate printers; *Huisstede & Brandhorst 1999*, 2: 1067–1069. The printer's device *Konst Baert Roem* (Art bears fame) used by Adriaen van de Venne and Joost Ockers in 1629 shows a book printer on the left and a plate printer on the right, but the publishers are not known as plate printers. It is used by eleven publishers after them, none of them known as plate printers, meaning the device had an emblematic content only, their publications being dedicated to the visual arts and poetry; *Huisstede & Brandhorst 1999*: 1066. From 1653 to 1670 the Hague address of Hendrick Hondius III is in 'de nieuwe Konst en

Boeckdruckerye in de Hofstraat tegenover de Gouden Leeuw'; *Waller 1974*: 147 (HONDIUS, Henricus (I)).
278
See above under 'Rise of the artist-etcher'. **Denison** (London 1895): 91; **Hamerton** (London 1871): 70; **Hamerton** (London 1881): 86; **Herkomer** (London 1892): 58; **Lalanne** (Boston 1880): 57, note.
279
See above under 'Guilds'.
280
Hind 1963-1: 312–321
281
Jacque (1852): 237, *L'imprimeur à qui l'on remet la planche gravée*.
282
Versteeg 2002: 19.
283
Burnett (1849): 6.
284
Bailly-Herzberg 1972, 1: 22; *Schaar & Hopp 1977*: 51. The Société des Aqua-fortistes ceased to exist on 15 October 1867, Luquet withdrew as compagnon and Cadart continued with Mr Luce as Cadart & Luce, rue Neuve-des-Mathurins 58. For an etching illustrating the façade of the new premises see the new illustrated magazine published by Cadart & Luce: *Illustration nouvelle*, 2 (1 Sept. 1869): pl. 57. For the same and a view of the inner court with the printshop see: *Bailly-Herzberg 1972*: 29–30; *Schaar & Hopp 1977*: 52, 62.
285
Lalanne (Paris 1866), underneath every print in the volume it states *(Paris) Imp. Delatre*.
286
Lalanne, in the first edition of his treatise, guided his readers through the printshop of Auguste Delâtre, who was responsible for the printing in Cadart's studio; **Lalanne** (Paris 1866): 83–94. From the second edition (1878) onwards Delâtre is no longer mentioned and the tour describes a printshop in general.
287
Hamerton 1 (1866): 295.
288
Ibid., **Hamerton** (London 1871): 70; *Roberson 1870*: 1.
289
Chattock describes equipment for transporting the etching plates, a box with a tripod to work in nature, including a mirror to view the landscape in mirror image, a bottle of acid, a tray, etc.; **Chattock** (1880–1882), 4: 12, 16. Paton describes preparing a bag with everything needed for drawing and etching a plate in the countryside, and how to work outdoors; **Paton** (1892–1894) 3: 91–92; **Paton** (London 1895): 124–128 plan II fig. m.
290
Hamerton 1 (1866): 295. It is unlikely that Hamerton carried the press on his back; he would have travelled around by carriage.
291
Bailly-Herzberg 1972: 270, 272.
292
Chattock (London 1882): 52; **Lalanne** (Paris 1866): 85, n. 1.
293
Roberson 1870: 1.
294
For the earliest plans of studios see: **Hayter** (London 1949): 27–29; **Lumsden** (London 1924): 63–65; **Paton** (London 1895): 179–181; **Ziegler** (Halle, 2nd ed., 1912): 265–269.
295
For suppliers in general, see below. For small-size presses in particular see: **Hamerton** (London 1871): 70; **Lalanne** (Paris 1878): 89, n. 1; **Potémont 2** (Paris 1873): [2].
296
Paton (London 1895): 171, plans III and IV.
297
Plowman 2 (London 1924): 62.
298
For home-built presses see Chapter 4, p. 308. Many articles discuss home-made equipment and materials but the manuals with the most elaborate information are: **Banister** (Totowa 1974), throughout the text; **Kok** (De Bilt 1982), throughout the text; **Porter** (London 1933): 76–87; **Silsby** (New York 1943), throughout the text; **Verbruggen** (Amsterdam 1981): 170–201. For papermaking see: *Lamb 2006*.
299
For plans of modern individual studios see: **Middleton** (London 1970): 57; **Strazza** (Milano 1979): 133. For plans of larger studios see: **Brunsdon** (New York 1965): 110 fig. 68; **Peterdi** (New York 1959): 293 fig. XIII.1.
300
Legg 2002; http://www.purchase.edu/departments/AcademicPrograms/Arts/artdesign/VprCourses.aspx (2010); http://www.trinity.edu/departments/art_art_history/pages/page2/facilities_printmaking.htm (2010); http://w3.kcua.ac.jp/about/fineart.html (2010). The Kyoto Seika University, Faculty of Art, in Kyoto and the Meisei University, Department of Art and Design in Tokyo (Ome City) also offer facilities for papermaking.
301
Derkzen Van Angeren 1930; **Erremes** (Leuven 1942): 67; **Hendriks** (Alkmaar 1944): 22; **Lankes** (New York 1936): 60, figs 22, 23.
302

See Chapter 3, pp. 192 and 221.

303

For an introduction to the supply of artists' materials in general see: *Kirby et al. 2010*.

304

See Jan van der Stock's ideas about this, as summarised in the Introduction, p. 3.

305

References to suppliers are given with the title descriptions in the Bibliography, see: Appendix 4, p. 433.

306

Bosse (Amsterdam 1662): [5] at the back.

307

Bosse (Nürnberg 1795–1796) 1: X, XIV; **Browne 2** (London 1675): 39; **Hassell 1** (London 1811): 18; **Meynier** (Hof 1804): 61. J.H. Green (1804) went a little further when he wrote and published his own book, whereas others before him translated an earlier text and had their books published elsewhere; **Green** (J.H.; London 1804): [3].

308

Alken (London 1849): 10, for S. and J. Fuller. **Bishop** (Philadelphia 1879): 22, for Janentzky & Co. **Bowles** (London 1760): 22, 31, for T. Kitchin. **Dröge** (Berlin 1930), for Heintze & Blanckertz. **Fielding** (London 1841) for Ackermann. **Hamerton** (London 1871) for Roberson & Co. **Lalanne** (Paris 1866) for Cadart, see p. 14. **Lalanne** (Paris 1897): 16, 87, with a one-page catalogue of printmaking materials offered by Lamour between p. [4] and p. I. **Mai** (Dresden 1924): 30, for Gneist & Wenzel. **Neale** (Springfield 1927) for Linweave, a paper producer, with a list of distributors of their papers on p. [1], while the manual is printed on and bound in their papers. **Netto 1** (Dresden 1815): XII, 4, for Arnold. **Robertson** (London 1883) for Winsor & Newton. **Shrubsole** (London c.1905): 1 at the back, for George Rowney & Co.

309

Spelman 2008, item 72, broadside by Matthew Darly, London c.1776.

310

English firms: Ackermann and his sons (est.1794), Roberson (est.1819), Hughes & Kimber (est.1820), later Penrose, Rhind, Winsor & Newton and so on, companies that sold printmaking materials at some time; **Ashley** (London 1849), 'Notice' between p. V and 1; **Rhead** (London 1890): 18–19; **Robins** (London 1922), for Hughes & Kimber p. 6 and p. 10 at the back, for Rhind: 7 at the back. For Ackermann and Roberson see: http://www.npg.org.uk/ (2010) and search for 'British artists' suppliers, 1650–1950', a provisional directory of colourmen. The Paris publisher Cadart supplied printmaking supplies to artists in the 1860s, his business being continued by his widow after his death; **Lalanne** (Paris 1866): 14; **Lalanne** (Paris 1879): 15. Lefranc & Bourgeois (est.Paris 1773) developed as an all-round producer and supplier of artists' materials, including its own range of etching materials, presses and printing inks. The firm established a branch in London in 1906 and is now part of the ColArt group; **Bayard** (Paris 1901): [5] at the back; http://www.colart.com/brands.cfm (2010). The firm of Donath supplied materials for etchers in Berlin before 1900; **Stauffer-Bern** (Dresden 1907): 121.

311

See above under 'Workshop training'.

312

Fielding (London 1841): [1]. The list of Sundry Articles (p. 9) also mentions 'French and other Tracing Papers' and 'Etching Ground and Tools'. Lithographic stones, plates, presses and 'every requisite material for the same' are found on p. 13, to show just how much Ackermann was involved in the graphic processes.

313

Hamerton (London 1871): 1–2 at the back. The presses are those designed by Hamerton and illustrated in later catalogues. For this table model press see Chapter 4, p. 308.

314

Advertisements for the inks, paper and presses by Lefranc & Co. and by Besnard, as well as for the plate printer Heuse; **Bayard** (Paris 1901): [5]–[6]. Roberson advertised 'Etching and Copper-Plate Printing Materials (including their) Improved Printing Press' in: 'Modern etching and engraving: European and American', in: *The Studio*, Special Summer Number (1902), AD. XVII. *Hofdrogerie* Carl Roth in Karlsruhe advertised their artists' materials, including etching materials; *Katalog Karlsruhe 1905*: 105.

315

Chapman (New York 1870): 267.

316

Roberson 1870: 1–2.

317

Lalanne (Boston 1880): XIII–XV, 63–64. Sternberg (1949), in speaking about the American situation, let it be known that materials could be bought in 'hardware stores', 'photographic supply shops' and 'drugstores'. 'Only a small part of the supplies require access to a well-stocked art store. Where materials are not locally available all large art stores will mail them'; **Sternberg** (New York 1949): 146. Compare with a similar range of suppliers in: **Reed** (London 1914): 58–61.

318

Preissig (Leipzig 1909): 121–125.

319

Plowman 1 (London 1914): 143–146.

320

Woods (London 1965): 31.

321

For some examples of costs and prices for materials in London and Oxford in the seventeenth and early eighteenth century see: *Griffiths 1998*: 29–30. Manuals may give lists of materials, but never prices. The exception is: **Emanuel** (London 1930): 247–249: 'List of Materials for Etching, with Range of Current London Prices (Liable to Variation)'. Note that payments to or salaries for designers, engravers, plate printers and other people related to the print business are not part of the present study, except for the occasional reference where thought necessary.

322

See also Chapter 3, pp. 133 and 137.

323

Christophle Plantin had contacts with dealers in copper plates and planishers, and ordered ready-prepared copper plates for the engravers whom he contracted; *Bowen & Imhof 2008*: 22.

324

Bosse (Paris 1645): 13; **Bosse** (London 1662): 4; *Diderot & D'Alembert 1751–1781, Seconde livraison, seconde partie* (= vol. 3): 1: *Fig. 6 Ouvrier qui présente un cuivre à un graveur* (see Fig. 101); **Schoonebeek** (Amsterdam 1698): 8; *Voet 1969–1972*, 2: 226. This was probably still the case in the United States in the nineteenth century; **Chapman** (New York, new ed., 1870): 255, '(Copper) plates are to be procured ready prepared'.

325

Pendred 1955: 8; **Spilsbury** (London 1794): 9–10.

326

Mark 'JON[…] // SHOELANE LONDON', impression of the back of a copper plate used for etching by Jan Chalon, active in London 1765–1795; Priv.Coll. Mark 'B.WHITTOW&SON // N.43.SHOE LANE / HOLBORN LONDON', copper plate, anonymous Dutch engraver, beginning nineteenth century, collection museumgoudA, Gouda, inv. no. 51.601; see also: *Bentley 2007*: 756–757. 'Whittow, Shoe-Lane, Holbourn', 'Torond, Little St. Andrew's Street', 'Watts, Queen-Street, Seven Dials'; **Bowles** (London 1760?): 22. 'Fossick and Son, Copper Merchants, &c. 9, Crooked-lane', 'Jones, Copper-plate-maker, 47, Shoe-lane', 'Pengree and Co. Brass and Copper-makers, 24, Snow-hill', Thoyts, Copper Merchant, 26, Bush-lane, Cannon-street', 'Whittow, Brass and Copper-plate-maker, 43, Shoe-lane', all in London in 1785. *Pendred 1955*: 8. 'Pontifex & Co., 22 Lisle Street, Soho'; *Bentley 2007*: 719–721, 727; *Phillips 2004*: 26 n. 22: 27 n. 23; *Phillips 2005*: 148 fig. 56. 'G. Harris, № 31, Shoe Lane', both Pontifex & Co. and G. Harris supplied copper plates for William Blake's *Illustrations of the Book of Job* (1825) and *Illustrations to Dante's Divine Comedy* (1827); *Bentley 2007*: 719; *Phillips 2004*: 26 n. 22; *2005*: 148 fig. 56. For more detailed information on suppliers of Blake's copper plates see: *Bentley 2007*: 751–758. 'Winkles, Lower Road, Islington', 'Hughes, Shoe Lane, Fleet Street', 'Wilson, Harp Alley, Shoe Lane'; **Ashley** (London 1849): V. 'Hughes, Shoe Lane, Fleet Street'; **Castle** (London 1849): 22. 'Hughes, Shoe Lane', 'Large, Dean Street, Getter Lane'; **Francis** (1842): 175.

327

J. Robinson was active in Manchester; **Paton** (1892–1893): 49. Netto stated that polished copper plates for engraving (*Stechkupfer*) were supplied in a number of German capitals, such as Vienna, Berlin, Munich, Dresden and Leipzig; **Netto** (Quedlinburg 1840): 6. German engravers and printmakers could acquire plates with the *Hofkupferschmied* Otto in Berlin around 1900; **Stauffer-Bern** (Dresden 1907): 120. Lalanne gave the address of Moreau, 33 rue Descartes, Paris; **Lalanne** (Paris 1866): 60. Delâtre (1887) recommended the firm of Servant, 1 rue Maître-Albert, Paris; **Delâtre** (Paris 1887): 33.

328

Filleau des Billettes (Paris 1693–1698): 111; *Voet 1969–1972*, 2: 226. Klaas van Hoeck was active as a planisher in Haarlem in 1688; *Miedema 1980*, 1: 314. The engraver Isaac van Jagen (fl. Amsterdam 1682–1727) was also active as a plate polisher for other engravers; Koninklijke Bibliotheek, Den Haag, Ms. 132 F 13-I, fol. 134; *Waller 1974*: 161. Hendrik Koster worked as a planisher of all kinds of metal plates in Amsterdam in 1708–1712; *Schipper-van Lottum 1993–2001*, 6: 620 no. 4326, 701 no. 5212, 7: 736 no. 4572, 758 no. 5621. The Frenchman Abraham George de Mare was active as a planisher (*Kunstplaatslijper*) in Amsterdam around 1800; *Waller 1974*: 214.

329

Buonaccorsi (Ravensburg 1916): [1]; **Delâtre** (Paris 1887): 33; **Lalanne** (Paris 1866): 59–60; **Schwarz** (Nürnberg 1805): 96. For more details see: *Bentley 2007*: 719.

330

Fielding (London 1841): [1] at the back; **Lumsden** (London 1925): [8]; **Paton** (1892–1893): 49; for names of plate producers see the various references below.

331

Castle (London 1849): 22.

332

Verheijden (Den Haag 1736–1739): 171.

333

Herkomer (London 1892); pls. between pp. 80 and 81, 82–83; **Paton** (London, 2nd ed., 1909): 84–85.

334

No references available, but the firm of Sellers is a likely candidate as a supplier of pre-rocked steel mezzotint plates.

335

Preissig (Leipzig 1909): 121.

336

Shin Nihon Zokei 2010: 42.

337

Their marks, and also those of the assaymaster, can be found on the backs of oil paintings on copper and with copper-engraving plates. A common seventeenth-century Antwerp mark is a 'heart' with the initials 'P S', on top of a cross crowned with the cypher '4', which belonged to the Antwerp coppersmith Peeter Stas; *Wadum 1999*, compare with figs 5.5, 5.10–13.

338

Mark 'GK' in rectangle, copper plate, Dutch engraver Daniel Vrijdag (1765–1822), *Rottenvanger*, Priv.Coll. Mark 'CEL', copper plate, anonymous Dutch engraver, eighteenth century, collection museumgoudA, Gouda. Mark 'J;RENNER / MÜNCHEN-SÜD', copper plate by the German printmaker Alf Depser, 1930s, collection Kunstkreis Norden, Norden; this is the firm of Jakob Renner, Dreimühlenstraße 55, Munich, who supplied copper and zinc plates and replanished used plates, see: **Buonaccorsi** (Ravensburg 1916): [1].

339

Hammered marks are sometimes visible in prints, when the back of the plate is used for an etching. Printed marks do not survive the making of the plate, because the ink dissolves readily in the solvents used in cleaning the plate.

340

Symonds (London 1649–1659): fol. 164; **Excellency** (London 1668): 55.

341

Szrajber 2006: 41.

342

Drukplaten were imported from Hamburg, Bremen and the 'Kleine Oost' to Amsterdam in 1779; George M. Welling, http://odur.let.rug.nl/~welling/paalgeld/products.htm (2010). Literally the term means 'printing plates', but the kind of plates or their function is not further defined. It could concern (used) copper plates or woodblocks for printing, but not necessarily.

343

Engravers' plates (1847); *Hunnisett 1980*: 222 n. 23; **Plowman 1** (London 1914): 146, gives Sellers's address as J.W. Sellers & Sons, 121 Arundel Street, Sheffield. The company still existed in 1949, but apparently had moved to New York, or had a branch office there; **Hayter** (London 1949): 55. German hardware shops specialising in English tools also sold steel plates for engraving; **Netto 2** (Quedlinburg 1840): 7.

344

Barthomeuf, 14 rue du Montparnasse, Paris, supplied copper plates at 7 *frs* per kilo plus postage; **Dake** (Amsterdam 1894): 15. One wonders why Dake gives the address. It cannot have been a problem to acquire polished copper plates in Amsterdam in this period because there were enough engravers and etchers available. The firm of M.B. Eisendrath, for example, supplied plates in Amsterdam from 1879 onwards; *Waller 1974*: 443.

345

Advertisement of: 'Nicolaus Power & Cy., Kupfer- und Stahlplatten-Fabrikanten von London in Carlsruhe', in: *Journal für Buchdruckerkunst, Schriftgießerei und die verwandten Fächer* (1844): no. 2, col. 30.

346

Diderot & D'Alembert 1751–1781, Receuil de planches, seconde livraison, seconde partie [= 3rd vol.]*, Chaudronnier*: pl. III.

347

Wadum 1999: 99, 101–102, with further references to prices of copper plates.

348

The price of copper increased significantly in England at the end of the eighteenth century; *Bentley 2007*: 726–727, 732 n. 49, 733. **Francis** (1842): 175; compare with **Fielding** (London 1841): [1] and *Roberson 1880*: 39. For costs of William Blake's copper plates see: *Bentley 2007*: 758–761, tab. 10.

349

Paton (1893–1894): 147; **Rhead** (London 1890): 17.

350

Unprepared copper cost 15 *stuijver* per pound in Antwerp in the sixteenth century, planished it cost 19 *stuijver*; *Wadum 1999*: 101. A polished copper plate cost 55 *sols* to one *écu* per pound in Paris in the eighteenth century; *Courboin 1914*: 33.

351

Perkins 4 (French ed. of 1822): 131.

352

The Sheffield firms of Rhodes, Hoole, Spear & Jackson, and Sellers delivered quality materials; *Hunnisett 1980*: 21. In Belgium polished steel plates were produced by Danjou of Brussels (see Fig. 103). See also Chapter 3, p. 133.

353

Hunnisett 1980: 43; **Turner** (1824): 57.

354

Roberson 1880: 39.

355

Turrel (1817): 141.

356

Francis (1842): 175.

357

See: Chapter 3, p. 154.

358

Cennini 1960: 13.

359

Oeconomische courant 1799–1803, 1(7): 167; **Schwarz** (Nürnberg 1805): 97.

360

Ackermann 1841: 9; *Roberson 1870*: 10; *Roberson 1880*: 39; *Winsor & Newton 1910*: 40.

361

For engraving tools see Chapter 3, p. 164.

362

Bate (London 1634): 138. For Theophilus see Chapter 1, p. 28.

363

Browne 1 (London 1660): 36. Fokke mentions burins from Geneva, Paris and England; **Fokke 1** (Dordrecht 1796): 193.

364

Bowles (London 1760?): 27.

365

Francis (1842): 175, with more addresses of suppliers; see also **Burnet** (1849): 6 col. 2. Knight has already been mentioned above as a supplier of zinc plates and as the publisher of **Bowles** (London 1760?).

366

Verheijden (Den Haag 1736–1739), p. 143: 'Graveerijzers. Engelse. 4 stuks kost 0–2–8. bij Mr. Kegelaer in de Schoolstraet.'

367
Netto 1 (Dresden 1815): 35 fig. 19 on the pl.; **Netto 2** (Quedlinburg 1840): 48. Netto bought his equipment in shops that specialised in English tools; **Netto 2** (Quedlinburg 1840): 7.

368
Chapman (New York, new ed., 1870): 265; **Lalanne** (Boston 1880): 64 n. 3, 68 n. 17. Chapman considered that 'any country blacksmith, from an old file, can shape a graver, and temper it rightly too; possibly not as well as Fenn of London, or Renard of Paris, yet still to serve'; **Chapman** (New York, new ed., 1870): 267.

369
Roller (Wien 1888): 35, without giving a name of a supplier.

370
Steel (London 1938): 8.

371
Fielding (London 1841): [1].

372
Herkomer (London 1892): 82; **Rhead** (London 1890): 63. Mezzotint rockers are measured by the width of their blades and the number of grooves per inch.

373
http://www.eclyons.com/ (2010).

374
Meynier (Hof 1804): 134–135.

375
Schwegman (Haarlem 1806): 6.

376
Bosse (Paris 1645): 19–20; **Schoonebeek** (Amsterdam 1698): 18–19. For etching tools see Chapter 3, p. 196.

377
Green (J.H.; London 1804): 14. See also **Paton** (1892–1894) 2: 49.

378
Lumsden (London 1925): 45.

379
Bishop (Philadelphia 1879): 10; *Roberson 1870*: 2.

380
The list of equipment accompanying Balthasar IV Moretus's order for a roller press in Amsterdam in 1714 also mentions a stove and a grill (*la poisle et le gril pour chauffer la planche*); *Voet 1972*, 2: 221–222.

381
Bosse (Amsterdam 1662): 118–122, [1] and [5] at the back.

382
Spilsbury (London 1794): 11.

383
Ibid., 12.

384
Fielding (London 1841): [1].

385
Ashley (London 1849): V.

386
Roberson 1880: 39.

387
Hubbard 1 (London 1920): [5] at the back; **Paton** (1892–1893): 49; **Preissig** (Leipzig 1909): 122; **Robins** (London 1922): 7 at the back; **Roller** (Wien 1888): 34–35.

388
Roller (Wien 1888): 35. The high price might be due to transport costs and custom duties.

389
Dake (Amsterdam 1894): 5.

390
See: http://www.lawrence.co.uk/acatalog/Etching_Grounds_Varnish.html (2010).

391
Charbonnel 2000: 30, 33; **Preissig** (Leipzig 1909): 121.

392
See Chapter 3, p. 199.

393
Bosse (Paris 1645): 11; on the availability of corrosive salts see the Münchener Taxaproject: *Krekel & Burmester 2000, 2001*.

394
See Chapter 1, p. 48.

395
Bosse (Paris 1645): 5, 45; **Bosse** (Amsterdam 1662): [18], 65; **Bosse** (London 1662): 33. In London, writes Bate (1634), 'strong water … is to be had at the signe of the Legge in Foster Lane a Distiller'; **Bate** (London 1634): 140. About 15 years later Richard Symonds paid a visit to Wenceslaus Hollar and saw him etch a plate: 'He uses to buy his water at the Refyners at Sr John Woolastons howse near Goldsmythe hall & pay 4s the pound. There is Aqua Fortis of 8s. idem'; *Beal 1984*: 291. The different prices probably meant that two strengths of nitric acid

were produced. Similarly, two strengths of nitric acid were produced in Holland around 1800, 'single' and 'double', at 16–18 *stuiver* a pound and 26–30 *stuiver* a pound respectively; *Van der Vuurst 1819*: 227. For different grades and mixtures of nitric acid see: *Demachij 1788*: 77–78. Small-scale production of nitric acid may be represented in Luyken's print *De Scheider*, literally 'The Parter', the maker of *scheiwater* or parting water, ie nitric acid used in the separation of silver from gold; *Luyken 1694*: no. 90. Larger scale production is depicted in the painting *The Nitric Acid Factory in Rome* (c.1761) by Louis Jean-Jacques Durameau; *Snack 1965*: no. 46.

396
Ashley (London 1849): V; **Hassel 1** (London 1911): 16.

397
Cooke (*Transactions*, 1826): 52; **Cooke** (*Franklin Journal*, 1827): 251.

398
Forbes 1970: 246. The *Amsterdamse Courant* (10 May 1703) has an advertisement for a nitric acid producer at the Elandsgracht; *Schipper-van Lottum 1993–2001*, 5: 479 no. 2741.

399
Welling 1999, see: 'Aqua fortis' for the years 1772, 1782 and 1783.

400
Both 'single' and 'double' nitric acid was traded in glass bottles of about 50 pounds each; *Van der Vuurst 1819*: 227. Sulphuric acid was also kept in glass bottles; *Annales de chimie*, 32 (1800, 21 Oct.): 328.

401
Hubbard 1 (Woodgreen Common 1923), note pasted in between pp. 2 and 3 or pp. 48 and 49, depending on the copy.

402
See Chapter 1, p. 34 and Chapter 4, p. 259.

403
Paton (1893–1894): 42; *Roberson 1870*: 1–2.

404
Lalanne (Boston 1880): 72–73.

405
Neale (Springfield, Mass., 1927): [1] at the back; **Pyle** (New York 1941): 101; **Preissig** (Leipzig 1909): 123; **Strang** (David; London 1930): [13]; **Trevelyan** (London 1963): 95.

406
Sourd 1995: 24.

407
Papers collected by me and information kindly supplied by third parties. I do not know of intaglio printing papers made by Chinese, Indian and Korean paper mills but this is highly likely.

408
Additional Act 1657: 50.

409
Prussian export statistics for 1785 show the same: *Mirabeau 1788*, appendix: *Liste des Produits qui ont été exportés de la Prusse Orientale, en mil sept cent quatre-vingt-cinq*. The import in Amsterdam from France was far less, with some odd shipments from other countries; *Welling 1999*, 'Linseed', 'Linseed oil'.

410
Andés 1903: 4.

411
Apps 1958: 16.

412
See Chapter 4, p. 271.

413
See Chapter 4, p. 272.

414
Bosse (Paris 1645): 66; *Pomet 1694*: 256.

415
In Kitzingen Frankfurt black could be ordered from Mr Landmann and in Mark-Steft from Mr Keerl in the later eighteenth century. A hundredweight of the finest quality would cost 15 florins; *Oeconomische Encyclopädie 1773–1858*, 56: 230–231; *Voit 1786–1790*, 2: 95-97. A lesser quality cost about 6 florins per hundredweight in Vienna in 1822. For comparison, a hundredweight of keensoot, a form of lampblack produced in Germany, cost 20–28 florins, vine black 20–24 florins and ivory black 5–8 florins. Ivory black was the most expensive per cubic unit of measure because it is heavier than the other blacks. In Nürnberg Frankfurt black cost 6–65 florins per 100 pounds, depending on quality; *Leuchs 1825*: 380, 397. In 1835 the levy on Frankfurt black was 3 *Thaler* and 20 *Schilling* per hundredweight when imported into Prussia. Import into the *Land* of Hannover and Brunswick was cheaper – only 2 *Thaler* and 2 *Schilling*; *Buchdruckerkunst 1835-3*; *1835-4*. The London plate printers Dixon & Ross were buying Frankfurt black at 1s 3p per pound, while French black was costing them 3s 6p per pound (1840–1851). They imported their Frankfurt black directly from the Gebr. Hänlein of Frankfurt (1857–1862) and later from Governor & Co., London (1872–1881); *Dyson 1984*: 151. For the Gebr. Hänlein see also: *Lorck 1874*: 109.

416
Gentele 1860: 278. It may even be questioned whether it was more the pigment's fame than its actual use that caused it to be mentioned so often. When the Amsterdam paper dealer Ysbrand Vincent tried to acquire the black in 1699 his correspondents in Strasbourg, Mainz, Frankfurt and Nürnberg could not get him any; *Sabbe 1928*: 200, referring to letters of Ysbrand Vincent to Anna Maria de Neuf, widow of Balthasar III Moretus, during 1699, concerning his attempts to acquire 150 pounds of Frankfurt black for the Plantin-Moretus printshop in Antwerp. Vincent estimated the pigment would cost 8 *stuiver* per pound. In the end he could get only some 10–12 pounds from an acquainted Amsterdam plate printer.

417
T.E. Lawrence sold 'Frankfurt Black', which actually is a bone black. The 'Frankfurt Black' sold by Graphic Chemical & Ink was a mixture of bone black and charcoal black. Personal correspondence in 1993 and c.2000 respectively.

418
See Chapter 4**,** p. 280.

419
Hartmann 1942, Appendix, no. 2: 472–473, l. 6-7; *Scholderer 1958*: 107.

420
The ink was tested by two women who prepared ink for their husbands, Jeanne Phelippon, wife of engraver René Boyvin, and Gillete Barrault, wife of Pierre Belleton. Furthermore the studios of engraver Etienne Delaune and of master goldsmith and engraver Nicolas de Villier were visited; *Bimbenet-Privat & Le Bars 1994*.

421
More references to book printers supplying ink for their colleagues or even specialised ink makers can be found in later centuries; *Bloy 1967*: 66–67. On 15 June 1640, M. Sublet de Noyers, involved in the establishment of an Imprimerie Royale in Paris, wrote a letter to M. Brasset, secretary at the Dutch embassy. He asked if Brasset could inquire whether it would be possible that four printers and four typesetters might like to work in Paris. He especially asked that one of the workmen should be familiar with making printing ink because he understood that Dutch printers had a secret recipe for making high quality printing ink; *Evers 1911*. The Haarlem book printer Isaac van Wesbusch produced soft and hard ink and let his colleagues know they could order the ink in any quantity; *Oprechte Haerlemsche Courant*, (17 February 1671).

422
Sentence de police, qui defend au nommé HOYAU, de faire de l'encre pour les imprimeurs en taille-douce, dans les quartiers habites de la Ville de Paris; Et qui lui ordonne de se retiere dans des lieux remaux, lorsqui'il voudra vaquer à cette Profession, à peine de cent livres d'amende. Paris, Du Vendredy douze Decembre 1732, Paris: P.J. Mariette (1732); *Bloy 1967*: 80 ill. 4; *Courboin 1914*: 5 n. 1; *Coyecque 1964*, 2: 98. The *sentence* was because he charred sheeps' bones for making bone black, which smelled rather penetrating. He was still producing black pigments for plate printers in 1739; *Le Bitouzé 1991*: 42.

423
J. Termeulen, *op de Princegraft over de Wester Kerk te Amsterdam*, offers for sale (parts of) the inventory of a bookprinting shop. He also sells thick and thin burned linseed oil for book and plate printers as well as ready-made printing ink, sent in little casks; *Nederlandsche Courant,* (1784) no. 44 (Monday 12 April), verso.

424
Bloy 1967: 67–70, 74–76, 81–85. *Maxted 1977*: xxiii–xxvi, 5–6. Pendred's Vademecum of 1785 mentions three printing ink makers. *Holden's Triennial Directory* for London of 1802 mentions eight ink makers. *Johnstone's London Commercial Guide & Street Directory* of 1817 lists eleven ink makers; *Pigot & Co.'s London … Directory* of 1822 gives eight ink makers. The numbers given vary as they are dependent on the arrangement of categories or shifting of criteria by the compilers of the statistics, as well as to usual changes in profession and people moving on or dying.

425
Dyson 1984: 95. Goulding made his own printing ink as he mentioned in a lecture in 1873; **Goulding** (Stirling 1910): 74.

426
Buchdruckerkunst 1835-1.

427
Dyson 1984: 148; *Frèrebeau 1974*: 14; *Lorck 1874*: 107.

428
Fischer & Naumann 1837.

429
Lorck 1874: 107–109. P. Thiergarten, whose address was 36 Rue de Seine, Paris, advertised as a supplier of black pigments, oil varnishes and furthermore anything needed for intaglio and lithographic printing, in: *Journal für Buchdruckerkunst, Schriftgießerei und die verwandten Fächer* (1844) 2: col. 32. Note that the London plate printers Dixon and Ross did buy Frankfurt black pigment from the Gebr. Hänlein of Frankfurt in the period 1857–1862; *Dyson 1984*: 24, 150.

430
In 1982 Charbonnel merged with, and in 1989 was taken over by, Lefranc & Bourgeois, who continued producing inks under the brand name 'Charbonnel'; *Charbonnel 1989*: [1]; *2000*: 6. Lefranc & Bourgeois have made their own intaglio inks probably since the late nineteenth century; **Bayard** (Paris 1901), advertising on p. [5]. Six printing ink manufacturers were counted in the Netherlands in 1878 but nothing is said about the kind and quality of their inks; 'Holland', *The Printing Times and Lithographer*, new series 4 (1878): 252. In Denmark etchers could buy varnish and ready-prepared ink with Pachts Farvefabrik in the 1890s; **Aagaard** (Kjøbenhavn 1894): 72.

431
Dyson 1984: 148; *Frèrebeau 1974*: 14.

432
In a lecture on 6 May 1904, Goulding stated that ink making 'is done now pretty mechanically and … it is left very much to the "Trade" to supply'; **Goulding** (Stirling 1910): 75. For similar remarks see: *Lorck 1874*: 107; *Ringwalt 1981* (repr. 1871): 217; *Seemann 1894*: 51.

433
Lefranc & Bourgeois (France), Bumpodo (Japan), Haruzo (Japan), Joop Stoop (The Netherlands), Peter van Ginkel (The Netherlands), Intaglio Printmaker (UK), Caligo (UK), Graphic Chemical and Ink Co. (USA), Akua (USA), Faust (USA) – all operate internationally. There are in addition some local ink manufacturers.

434
See Chapter 4, p. 287.

435
Bosse (Paris 1645): 57–64, pl. 11–13.

436
Based on the plans of the 1645 edition of Bosse's treatise, together with master carpenter Herman den Otter, I reconstructed a wooden roller press for the Rembrandt House Museum in Amsterdam in spring/summer 2003; **Bosse** (Paris 1645): 57–64 pl. 11-13; *Otter 2011*. The press has operated since September 2003, giving daily demonstrations to the museum's visitors. Based on the plans in the 1745 edition a reconstruction is kept by the Arie Collegio Hall in Minamishimbara, a town east of Nagasaki, Japan, in the 1990s; **Bosse** (Paris 1745): 129–144 pl. 14–19. The press is intended for display purposes only and is not in use. Various small-scale models exist of copies after the designs in editions of Bosse's manual.

437
Roubo 1977: vol. 3, pp. 970–971 accompanying pl. 327, figs 3–6.

438
See Chapter 4, p. 304.

439
Typically, a design for a table model roller press is given in Roubo's encyclopaedic manual on joinery; *Roubo 1977*, 3 (repr. 1775): 970–971 pl. 327 figs 3–6.

440
Moxon 1978: 12, 45, 253–256.

441
Ibid., 253, note. The compilers of the modern edition give some further details about five 'printers joiners' in London in the eighteenth century and two more in Oxford. There were eleven printers' joiners and eight printers' smiths active in London in 1817, and nine printers' joiners in 1822; *Maxted 1977*: xxv–xxvi.

442
Grivel 1994: 42; *Meyer 2006*: 264.

443
This is a wooden roller press with metal rollers, gearing, messing bearings and metal spindles. The press was manufactured by Jacob Bernard Haas, Lisbon, 1802 or shortly afterwards, and is kept by the Portugese Mint in Lisbon. The press was first used by Luís André Dupuis and then by Francesco Bartolozzi until 1810; *Jatta 1996*: 57.

444
After the death of the Amsterdam print dealer Cornelis Claesz the inventory of the shop was auctioned, among which were 'several' roller presses, *Verscheyden Parsen om Const en Caerten op te drucken*; *Claesz 1610*: fol. B4r. Three roller presses were sold at fl. 70,–, fl. 84,–, and fl 72,– respectively at the auction of the inventory of the printshop of Joan Blaeu, Thursday 7 April 1695; *Proeve 1695*; *Van Eeghen 1960–1978*, 3: 24.

445
The press was smuggled into Antwerp on 17 December 1714 not, as would nowadays be the case, to escape import duties but to avoid difficulties with the Antwerp guild of carpenters who would have immediately protested about 'unfair' competition; *Sabbe 1928*: 200–202; *Van Eeghen 1960–1978*, 4: 256; *Voet 1969–1972*, 2: 222.

446
Janssen 1986: 324–326, n. 232.

447
Museum Plantin-Moretus in Antwerp, shelfmark: Arch. 697: no. 55; *Dyson 1984*: 83; *Phillips 2003*: 17, 19.

448
Dewing was the first professional engraver and plate printer in North America; *Larson 1985*: 4; *McNeely Stauffer et al. 1994*, 1: 64–65; *Shadwell*: 33, fig. 48; *Wroth 1994*: 285. See Chapter 1, p. 62.

449
Fosie 1743: [8]–[12].

450
Compare with the first metal book printing press constructed by Wilhelm Haas and Son, and by Earl Stanhope in this period; *Moran 1978*: 40–41, 49–57.

451
Bathe & Bathe 1943: pl. XX, opp. p. 90. The very first metal roller press was produced in Paris in the 1690s; **Filleau des Billettes** (Paris 1693–1698): 165 pl. [4]. See also Chapter 4, p. 304 and Fig. 248, p. 303.

452
Solly (1819): 59.

453
Jöntzen (1836): col. 75.

454
Krause 1904, *1955*; *Lilien & Gerhardt 1978*: 93.

455
Dyson 1982–1983: 11–12; *1984*: 108–111; **Lumsden** (London 1925): [2]; **Paton** (London 1895): 171; **Plowman** (London 1914): 144–145; **Robbins** (London 1922): 6 at the back.

456
Among the machines in their 'Catalogue of printing presses and printer's materials' (1881) two roller presses are illustrated; *Hoe 1980*: 34–35. On Hoe's death his three sons took over and business bloomed all through the nineteenth century, declining again in the twentieth century until it failed in 1969.

457
Pennell 1921: 205, ill. on p. 213 of a press by Sturgis which is based on a press by Haddon & Son designed by Frank Short; **Plowman** 1 (London 1914): 143–144.

458

Philip Hamerton designed the plans in 1866 and it was put into production by 1870; **Hamerton 1** (1866): 295; **Hamerton** (London 1871): 70. See Chapter 4, p. 308.

459

The Paris printshop of Lacourière et Frélaut (est.1929), where so many important twentieth-century artists had their works printed, closed in January 2007; *Dyson 2008*. Some modern small printshops with one or two presses are currently active in Paris.

460

The company moved out of London and is now based in Binfield, Berkshire; *Bain 1966*; *Dyson 1984*.

461

Cate & Grivel 1992.

462

Charbonnel 1989: [1].

463

The firm of Ackermann also still exists, but as print dealers only; *Maxted 1977*: xiv; http://findarticles.com/p/articles/mi_m0PAL/is_509_159/ai_n6134753 (2010).

Producing the Matrix

> In the hands of the artist-printmaker, the intaglio plate, the materials, and the techniques form a web of dynamic, continuous patterns in which the artist is an active participant. In this way, printmaking becomes a living art – a path of learning and discovery through which to express oneself.
>
> *N. Krishna Reddy*[1]

Intaglio printing plates can be produced in a large variety of ways, the most common being the techniques referred to as 'engraving' or 'etching', but there is so much more. Within the context of this study the word 'matrix' is therefore chosen as a general term for printing formes produced in intaglio printmaking. The history of the production of the printing plate is also marked by continuous invention, reinvention and development of plate-making techniques. For example, 'aquatint' was invented independently three times – in Sweden in the early 1650s, Holland in the 1750s, and France in the 1760s – while a new version of the French technique was developed almost independently in England around 1770.

The present study concentrates on manual intaglio printmaking procedures. To place these in the larger context, attention is also paid to mechanical, photomechanical and digital processes because: they developed from manual processes; they were often combined in the nineteenth century; hybrid techniques are common in contemporary printmaking.

The Printing Plate

Very little research has been carried out on the study of historic printing plates and very few publications are dedicated to the subject.[2] A number of printrooms keep plates for comparison with their prints or as historic examples.[3] Four chalcographies – in Brussels, Madrid, Paris and Rome – have larger collections of printing plates.[4] They produce restrikes, which are for sale. Some other larger plate collections exist, such as that at the Museum Plantin-Moretus in Antwerp, and many more plates are spread over smaller collections.

Until 1800 few metals other than copper and its alloys were used for intaglio printmaking. Copper alloys can be manipulated in many ways, cause few problems in printing and relatively large print runs can be pulled from copper alloy plates before wear becomes visible. Some brass plates are handed down, and brass and bronze is sometimes referred to as plate material. Occasionally iron was used but rarely reached beyond the experimental stage. It could be etched easily but was difficult to engrave and rusted quickly. The softer tin, or pewter, was utilised for printing musical scores after 1700 as the soft metal could be hammered with punches. However, printing using tin creates spots because the ink adheres strongly to the metal, creating plate tone in the impression. Zinc plates, on the market from around 1800, are suitable for etching, less so for engraving and not at all for long print runs because the metal is rather soft. The qualities of glass and especially its high wear resistance were certainly recognised when techniques were developed to etch glass in the eighteenth century, but by the time the problem of breakage in printing had been solved in the mid-nineteenth century, the focus of the printing trade had already moved in different directions.

Steel was favoured for four decades after a suitable working method was found in 1819. The technique is termed 'steel engraving', although in most cases the steel was not engraved but etched. Steel, because of its hardness, allows the finest textures to be printed in runs of tens of thousands and the metal prints meticulously. Its properties proved

ideal for the particular 'smooth' style of imagery appreciated in the period. Steel plates were used until the introduction of steelfaced copper plates in England in 1858 made working steel plates obsolete and printmakers reverted to the use of copper. Steelfacing (see below) adds to the versatility of copper and permits the printing of longer runs.

Engravers did not immediately stop working in steel just like that, of course. The printing trade was concentrating on other techniques – photography had been introduced and printing was being mechanised on a large scale. The handmade etched print no longer fitted into industrial processes. Artists opposed to these changes became more and more involved in etching copper plates manually, until it was *bon ton* to prepare and print the plate themselves. In this way the 'artist-etcher' evolved.

Separation of printmakers and the printing trade has since been quite clear-cut; printmakers had their own plate materials. Because there was no longer a need to print editions in their thousands, many other (softer) plate materials were experimented with, such as aluminium, plastic and cardboard. Each plate material has its specific properties and allows for particular manipulation, which shows in the prints pulled from it.

Nylon or steel plates covered with a light-sensitive photopolymer layer are used by the printing industry and attracted the attention of some printmakers in the mid-1980s. Ten years later photopolymer films used in the computer industry were successfully introduced into intaglio printmaking as they blended so well with digitally generated imagery.

A major reason for the popularity of these materials is that they present fewer health and safety issues when compared to the etching of metal with mineral acids. Apart from new plate materials, other kinds of etching fluids were also developed alongside new types of printing inks and cleaners in an effort to improve the health and safety aspects. The effect of this so called 'non-toxic' – an inappropriate term given the reactive chemicals used – movement was the creation of prints that appeared markedly different from etchings on metal. This has been accompanied by the development of alternative techniques offering greater opportunities to printmakers.

Metal plate

From the Middle Ages up to the end of the eighteenth century only a few metals were available in plates: gold, silver, copper, iron, tin, lead and some of their alloys. Metal can be both engraved with special tools and etched with particular etchants. Copper was the metal of choice for intaglio printing plates while steel became of major importance between 1820 and 1860. Printmakers' interest in other metals, mainly zinc and aluminium, escalated in the second half of the twentieth century.

It is rare to find any research into the actual materials used in intaglio printmaking. A recent count of the Calcografía Nacional in Madrid showed that 88% of their collection are 'copper' plates as compared to other metals, stone, wood and linoleum, but no further distinction is made between copper and its alloys.[5] Such observations are nearly always visual; scientific analyses of the extant printing plates could help to quantify the use of particular metals and their alloys for printing plates.[6]

Copper
From the early days of intaglio printmaking, copper was the standard plate material used (see Fig. 19, p. 25)[7] because it can be etched, is soft enough for engraving, can be scraped and polished and is hard enough to withstand printing up to a few thousand copies. Copper has always been relatively expensive, although still cheaper than gold and silver, and was commonly available. It is the plate material most frequently mentioned in documents and the majority of extant historical printing plates are made of copper.

Bosse is quite particular about the copper needed, probably because it was quite difficult in his day to maintain full control of the production of the metal and hence the quality of the plates.[8] Copper was mined all over Europe and Russia, but according to the sources, good quality copper came from Hungary, Norway or Sweden.[9] By the nineteenth century, copper production in France was concentrated in four factories in Romilly, Imphy, Montataire and Essonne.[10] Villon is the last author of a printmaking manual to discuss the format, thickness and purity of copper plates; the purest is electrolytically deposited copper.[11] Most authors after him suggest simply using copper, or another metal, without further specifications.[12]

Historical sources do not provide detailed information about copper, which in any case would be difficult given the absence of scientific standards. Analysis of existing materials may support further research into the provenance and processing of the metal. This is still uncommon in art history but in a dedicated project, measurements (height, width, thickness and weight) of a group of 82 Rembrandt plates were taken before they were sold at auction in the spring of 1993, after which they were dispersed all over the world.[13] Metal analysis was not possible at the time, but by calculating the volume of a plate using these data and dividing weight by volume, the weight per cubic unit of the specific object can be found. Results of the calculations are positioned within a range of 6.00 to 10.89, the average being between 7.5 and 10 kg per dm^3.[14]

The voluminal mass of (cast) copper is 8.9 kg per dm^3 at 20°C; for hammered and rolled plates the number is higher because the metal is more compact. For an alloyed copper the value is different; a copper-zinc alloy type of brass has a voluminal mass of 8.4 kg/dm^3, for example. As these are precise measurements how can the differences be explained? When larger amounts of the plate are etched or engraved, more metal is removed but the measurements of the plate remain the same, resulting in a (slightly) lower value per cubic unit. Further deviations are due to the varnish that protects Rembrandt's plates as well as residues from steelfacing and printing ink, but all this does not explain the large range of the results calculated.

Brass and bronze

Copper alloys would have been used frequently, but are rarely mentioned in manuals.[15] There are a few documentary references to copper alloys and brass plates are discussed now and again.[16] Its use would have been a matter of personal taste – Bosse, for example, was not happy with it and rejected it.[17]

Brass is harder than copper and thus wears more slowly, an argument to choose the harder metal. Knowledge about producing suitable alloys and more homogeneous mixtures was becoming more widely available, which may be why Stapart (1773) gives details about copper and brass compositions.[18] How often brass was used as opposed to plain copper cannot be estimated. Deleschamps (1836) says vaguely that its use is fairly common (*assez répandu*) as an intermediary between the softer copper and the harder steel (he was writing during a period in which steel engraving was flourishing).[19] Some decades later, brass seems to have lost its favoured position, probably due to the introduction of steelfacing, despite the fact that brass could yield more than double the number of copies than could be pulled from copper plates.[20]

Bronze, a copper-tin alloy harder than copper but softer than steel, is mentioned in nineteenth-century European printmaking manuals when discussing etching.[21] Its drawback is that the two metals of which it is composed react differently to the nitric acid then commonly used as an etchant, for which reason some hydrochloric acid was added to regulate the biting.[22]

Gold and silver

Gold and silver are found as materials for printing plates only occasionally. The earliest reference is that by Dürer, who wrote to Georg Spalatin in 1520 about a crucifixion he had cut in a small circular gold plate and from which he had pulled some impressions.[23] Medallions to commemorate special events such as weddings or portraits of famous persons, for example, are occasionally engraved from precious metals. Because of the intrinsic value of gold and silver such engraved plates were held in high esteem and kept in special collections.[24] Gold and silver plates, also including three-dimensional engraved objects, were not intended for printing, although some were proofed in small numbers (Figs 109 and 110).[25] Impressions commonly, but not always, can be recognised because they are finely engraved.[26] Typically, they are often of oval or round shape when conceived as medallions, the prints have texts in reverse and publishers' addresses are missing because impressions were meant for *intimi* and not for trade.[27] Engraved brass or copper plates are sometimes gilded in order to accord them a special status.[28]

Tin and lead

The use of tin printing plates is rarely found in art historical studies. A tin or pewter (*stangno*) printing plate is found in the Rosselli inventory of 1527 that may have been used for relief printing.[29] William Blake etched four plates for Hayley's *Little Tom the Sailor* (1800) on pewter.[30] Some of the prints illustrating the second edition (1827) of Tischbein's manual are, according to the accompanying list, printed from tin plates.[31] Some more examples probably exist, but the metal was clearly not favoured for the production of imagery. Tin or pewter plates were more commonly used for musical scores, certainly in the eighteenth century (Fig. 111).[32] Later on in the nineteenth century, lithography became a preferred medium for printing music, but tin plates continued to be used until the early twentieth century.[33]

References to lead intaglio printing plates are not found. Deleschamps discusses an alloy of lead and antimony, or typemetal, which is suitable for engraving secondary work. The combination of the two metals complicates the etching process because when one metal is corroded by a particular acid, the other metal does not react and vice versa.[34] Lead is occasionally encountered in modern printmaking studios. The material is soft, can be carved, manipulated with soldering tongs and folded – all of which creates interesting textures. Pulling an impression from a lead plate in intaglio conflicts with the material's soft character: textures and relief are flattened, and plates are stretched under the high pressure needed for intaglio printing. Printing with anything other than the darker colours will foul the ink because inking and wiping the soft metal leaves particles that discolour the ink. Lead is therefore not suitable for meticulous printing, although the metal has interesting characteristics for the experimental artist.

Iron and steel

Controlled corrosion of metals by means of acid-resistant materials was known by the end of the thirteenth century, documented in the fourteenth century and applied to the decoration of arms, tools and locks in the fifteenth century.

Based on the available knowledge of the time, the first etched intaglio printing plates were iron.[35] The etching of iron plates lasted from shortly before 1500 until the 1540s. Thereafter knowledge of etching iron and steel objects was widespread through the centuries but the etching of iron printing plates was the exception rather than the rule.[36]

A search for harder materials for printing plates, such as glass and steel, started before 1800, driven by the need to find printing papers of value for longer print runs than could be printed from copper. Glass would have been preferred due to its better wear resistance, but it fractures easily when passed through the press and it is virtually impossible to make alterations (see the discussion on glass below). Steel provided better options. The engraving of steel dies and punches, shoe buckles, gun locks and swordblades had already been known for centuries,[37] but for printmaking purposes there were two problems: how to prepare larger plates and how to engrave them.

The answers to both these questions were known: the steel plate had to be softened, engraved and then hardened again, and burins needed to be harder than the plate metal. Burins made of special steel alloys created harder and tougher steels than was possible by carburising (hardening) plain iron. More information about rare metals became available by the late eighteenth century and as a consequence knowledge on the use of alloys for burins increased.[38] In order to soften the plate it is heated and slowly cooled again with the result that the steel decarburises (carbon is removed) and becomes softer. Then follows engraving, after which the plate is heated to be carburised (carbon is introduced) and quickly cooled to harden again. The problem is that plates of 1.5–2 mm thick buckle on cooling.

The first promising trials in making steel-engraving plates were performed in parallel and independently from each other in the United States and in France. An English patent was granted to Joseph C. Dyer on behalf of the American Jacob Perkins on 1 October 1810. The Frenchman C.P. Molard engraved two heads on a steel plate (including the date '8bre 1810') that was printed by Gonord in an edition of 40,000 copies (Fig. 112).[39] Molard based his method on a decarburising process invented by a Mr Schey in Paris and patented in 1808.[40]

Jacob Perkins was an American engineer and former engraver who took out a large number of patents.[41] For engraving steel printing plates he combined his knowledge of steel with the urgent need for printing papers of value (banknotes, stocks) in long print runs that could not be counterfeited. Initially, Perkins prevented the buckling of the steel plates during hardening by using blocks of 0.5–1.5 inch thick,[42] but the added weight made them difficult to handle. He therefore constructed a special, full metal press. A block was inserted into the bed and heated or warmed in the press, thereby eliminating the need for it to be moved from the working bench to the press and back again.[43]

Perkins's invention also came about due to the abovementioned need for printed papers of value, which could not be counterfeited, for long print runs. On the basis of the 1810 patent, his companion Dyer contacted the Bank of England. The bank's engravers made a series of tests but conceded defeat in 1813 – engraving steel took four times longer than engraving copper and plates were damaged in the hardening process.[44]

Others also endeavoured to work on steel. Charles Turner, advised by James Watt, attempted working in mezzotint on steel but failed because the material was too hard. Success was achieved after 1820.[45] The Bank of England offered £20,000 to anyone who could devise a method to prevent counterfeiting, an incentive to Perkins who set sail to England in 1819.[46] By that time Englishman Charles Warren had resolved the problem of buckling by using a thin saw blade, which was run through a roller press to flatten it again after hardening.[47] The invention, although intended for papers of value, had the advantage that the plates could be engraved almost as if they were copper plates and printed on a normal roller press, while giving ten times as many impressions.[48]

Whereas Perkins's blocks were good for pulling hundreds of thousands of impressions and eventually proved ideal for the printing of postal stamps and the like, Warren's plates could only print up to 25,000.[49] However, the potential of his invention was quickly recognised and soon applied to illustrations in books and magazines that were produced in smaller quantities. Warren's invention flourished as 'steel engraving' for four decades, albeit that problems were encountered in the uniform softening of the plates.[50] But on the whole, steel engraving was a resounding success, and the process was quickly taken up and practised overseas.[51]

But engraving, even in softened steel, remained a slow and laborious task and only shallow, thin grooves could be produced. Efforts were therefore aimed at refining the etching process, particularly for etching steel, and the first recipes for etchants for steel printing plates were published in 1825.[52] For the next three decades steel was the preferred plate material throughout Europe and the United States when longer print runs were needed.[53]

Copper was not forgotten however – the metal was still easier to handle but simply could not print sufficient impressions because it was too soft and wore quickly. The solution was found by facing the plate with a thin layer of iron (see 'Steelfacing' below) and soon any engraver or etcher with artistic aspirations had turned to copper again. The *Printing Times and Lithographer* stated in 1882: 'Speaking of the prizes awarded to the students of the Royal Academy, The Academy well says: "We are sorry to observe that one of the prizes for which there was no competition was that of steel-engraving."'[54] The use of steel plates did continue, and references to their engraving and etching are found long into the twentieth century, but rarely with more information other than that steel can also be etched.[55]

However, the disappearance of steel engraving was not only due to the introduction of steelfacing, but also to the massive explosion of other printmaking techniques. Intaglio printmaking as a major graphic technique had already been superseded by lithography, wood engraving and by the mechanisation of planographic and relief printing from

the 1840s, while the new photomechanical processes were progressing well by the mid-1850s.[56] Etching iron and steel for artistic purposes reappeared in the 1940s, more generally in experimental forms such as tinned iron plate or flattened tin cans.[57]

Zinc

Some occasional finds of metallic zinc have come down to us from antiquity, but zinc was probably not recognised as such then. The metal was known in the Middle Ages and applied as the product of a particular kind of zinc-rich earth (calamine) melted together with copper to make brass. After polishing, brass objects have the golden appearance so much admired for household ware and lithurgical objects. Pure metallic zinc was found condensed in the smelting ovens in the sixteenth century and was used locally. Pure zinc was already being produced in China and India around the year 1000 and ingots were imported into Europe from shortly before 1600.[58]

Zinc can be engraved, but the metal's structure is too irregular for refined work. Etching zinc is easy because it reacts quickly, but the metal is soft, wears rapidly in printing and is therefore unsuitable for longer print runs. It can be worked easily, is cheaper than copper and is an appropriate option for shorter print runs.

The metal was mined in the eighteenth century in central Europe.[59] It probably became available in plates around 1800 and etchings from zinc are found shortly afterwards.[60] Starting with Heinrich Wilhelm Eberhard (1822), the use of zinc plates is mentioned regularly in nineteenth-century printmaking manuals.[61] Zinc only became a truly popular plate material for etching in Europe in the course of the twentieth century as it was considerably cheaper than the traditional copper and because there was no longer a need for lengthy print runs.[62]

Steelfacing

Throughout the ages different ways have been sought to extend the life of a printing plate. It was common to engrave new copies of a plate or to repeat the design as often as needed.[63] Theodor Thon (1831) suggested printing the earlier copies of a plate with greyish ink, making the ink blacker in the course of printing to limit differences between earlier and later impressions.[64] It is not likely this suggestion went further than the idea given the time and costs involved in preparing different batches of ink and the amounts of lead white that would have been needed. Another consideration is the influence such inks would have on the appearance of the impressions. Engravers would probably not have been too happy with seeing the first proofs of their plates already looking 'worn' instead of the crisp black and white appearance with which they were familiar.

An effective solution to the problem of wear was found in 'galvanisation' or plating. This involved covering an object with a thin layer of metal, generally iron, by means of electrolysis. In 'steelfacing', a mild steel plate (iron with 0.2–0.4% carbon) is connected to the anode (+ pole) of a battery and hung in a salts solution. The copper plate is connected to the cathode (– pole) in the bath, a current is passed through and the steel plate releases ions into the solution leaving the copper plate covered with a very thin layer of iron.[65]

The discovery of electricity in the eighteenth century brought a wave of new inventions. Electrolytically covering metal objects with thin layers of another metal by electrolysis (galvanisation) became very popular.[66] The history of the electric plating process is complex with many players, but in the field of intaglio printmaking two names stand out. Electroplating was invented by Moritz Hermann von Jacobi in February 1837 and presented to the Academy of Sciences in St. Petersburg, Russia, on 5 October 1838.[67] In Liverpool, Thomas Spencer 'reinvented' the process and presented a paper at the Liverpool Polytechnic Society on 12 September 1839; C.J. Jordan was simultaneously working on the process in London.[68] Spencer not only observed plating of the metal connected to the cathode (– pole), but also corrosion of metal connected to the anode (+ pole). While developments in plating allowed the replication of printing formes called 'electrotypes' and steelfacing, corrosion progressed towards electrolytic etching, discussed above.[69]

The idea of covering an engraved copper plate with another metal to extend its lifecycle followed quickly. Immediately after the presentation of the daguerreotype process in 1839, attempts were made to convert the new medium into a printing plate.[70] The first problem to overcome was the superficial texture of the soft silver (or silvered) plate, which needed to be strengthened to avoid it wearing off after printing just a few impressions. Fizeau therefore discussed copperfacing daguerreotype plates in 1844.[71]

Henri Garnier, supported by Jean Joubert, developed a version suitable for galvanising copper printing plates with iron – commonly known as 'steelfacing' – in Paris in 1857. Mr Jaquin took out an English patent in March 1858 and Joubert gave an official presentation on Wednesday, 24 November 1858 at 8.00 pm at the Society of Arts.[72] The text of Joubert's process was published two days later and with that steelfacing became widely known.[73] He was challenged by Henry Bradbury in the ensuing discussion in the *Journal of the Society of Arts* during 1859.[74]

Bradbury, during his itinerant years, had studied at the k. und k. Hof- und Staatsdruckerei in Vienna from 1852 to 1853, travelling to other major printing houses in Germany and Paris afterwards and acquainting himself with the latest developments in the printing trade.[75] Commenting on Joubert's steelfacing method, he refers to the already existing methods of protecting copper plates by facing them with gold or silver, which he had seen during his travels and from which kind of plates he had himself printed on his return to England.[76] He also quotes from one of his lectures at

the Royal Institution in 1856, in which he alluded to metalfaced electrotypes that 'yielded on an average 1600 perfect impressions – and experiments are in course of operation for increasing this to between 3000 and 4000'.[77]

Bradbury countered Joubert with his own zincplating and nickelplating methods, the first being a lot cheaper and the second being more durable, including mention of his experiments with palladium and platinum.[78] He also stated that Joubert had made a tidy profit by offering steelfacing for 2–6d per square inch, while the job could be carried out for a farthing (¼d) per square inch.[79] The discussion died out after six months and metalfacing was quickly accepted both in England and overseas, becoming the preferred method for protecting both artistic copper plates as well as intaglio plates, and relief printing blocks for the printing trade.[80]

With the invention of steelfacing copper plates, engravers and etchers returned to copper – for aquatint and mezzotint plates the process was a welcome addition. The plating protected the fragile surface textures that rendered the subtle tones, which otherwise would wear quickly in printing.

Galvanising the printing plate with steel (iron) is effective and can pull more impressions per copper plate. In addition, at the first signs of wear of the thin layer, the iron can be washed off quickly with dilute (5%) nitric acid, which does not corrode the copper, allowing the plate to be steelfaced again,[81] and permitting tens of thousands of impressions to be pulled from a copper plate with plain etching or engraving. Zinc can also be steelfaced.[82] Direct plating the iron on the zinc is possible, but the iron cannot be washed off without the nitric acid corroding the zinc, so the answer is to first face with copper and then with iron.[83] Rust on steelfacing does not affect the copper plate but annoyingly the plate has to be defaced and galvanised again.[84] Other plating metals were therefore tried, such as chrome, nickel and cobalt, which are very hard and do not rust.[85]

Steelfacing and chromefacing are still in use, although it is more and more difficult to find companies specialised in handling intaglio printing plates. They are mentioned in modern manuals, but only rarely are details provided.[86] The difference between the two is that printing ink leaves a thin film of ink (plate tone) on steel after wiping, while a chromefaced surface wipes clean. Chrome is also harder, allowing longer print runs.[87] Depending on the technical possibilities and the kind of impression wanted, the printmaker may choose one or the other. When printing in black, steel may be preferred because the minor plate tone left makes the print look livelier. Chromefacing may be preferred in colour printing, especially when bright colours on a clean white surface are desired.

Other metals

Of the other metals tried for intaglio printmaking since the beginning of the twentieth century, aluminium is the most favoured.[88] Because of its amphoteric character the metal can be etched by both an acid, such as hydrochloric acid, and an alkali, such as sodium hydroxide. It can be deep-etched with a copper sulphate and kitchen salt solution.[89] The softer varieties – alloys with iron can be as brittle as glass – are suitable for drypoint, but only in small print runs because the metal wears rapidly.[90] The metal has the further advantage that it is cheaper than zinc, although that may depend on the region and the period. Other metals mentioned include magnesium and 'micro-metal', apparently a zinc alloy.[91]

Non-metal plate

Non-metal plates suitable for intaglio printing were tried in the nineteenth century but only found favour in the late twentieth century. The more commonly found are discussed below.

Glass

Glass, and glass-like material, can be worked in various mechanical ways: it can be engraved with a diamond point and with an electric drill, and it can be ground with carborundum and sandblasted. The material is resistant to most chemicals, stimulating the search to find suitable etchants.[92]

Indications are that glass etching was used occasionally in stained glass windows in the Middle Ages and some mediaeval recipes for etching glass have been handed down.[93] Heinrich Schwankhardt from Nürnberg is said to have etched glass in 1670. In all likelihood his technique involved nitric acid acting on impurities in the glass, such as sodium and potassium compounds. The impurities would dissolve in the acid and the remaining glass particles could be brushed off in cleaning.[94] From Schwankhardt on, recipes for etching glass with nitric acid or related salts solutions can be found.[95]

Johann Georg Weygand published a text on etching glass with hydrofluoric acid in 1725. The essence of his recipe involved heating a mixture of calcium fluoride and nitric acid for 24 hours. This creates hydrofluoric acid, the only mordant capable of corroding glass itself.[96] However, information on this method was not disseminated throughout western Europe until the end of the eighteenth century. Texts on printmaking tended to cite it as an additional etchant, not always recognising it as a method of making intaglio printing plates.[97] Etching glass with hydrofluoric acid was seen as 'more curious than useful'.[98]

Following the development of a mordant suitable for etching glass, the next step was to prepare glass printing plates. The wear resistance of glass is high, which makes it ideal for the production of long print runs such as banknotes. The first attempts to print from glass plates date from the final decade of the eighteenth century. Starting in France, Mr Puymaurin presented a glass intaglio printing plate to the Académie des Sciences in 1787.[99] The Scottish professor, Patrick Wilson, considered the problem in the early 1790s[100] and the practical aspects were further worked on in Austria and France.[101]

The advantages of glass over copper are clear: finer and more delicate lines can be achieved and the high wear resistance allows for longer print runs. As a consequence several authors discussed etching glass printing plates, also known as 'hyalography', in the first half of the nineteenth century.[102] The major obstacle remained breakage, a problem that was more or less resolved by Bromeis and Boettger by the 1850s when they fixed the glass plate into a depression in a wooden block (Fig. 113). This allowed the plate to be handled much as any other intaglio plate – it could be inked, wiped and printed. Even in the event of breakage, the plate remained firmly held in the woodblock – printing could continue although any cracks in the plate would show up in the impression.[103]

The solution to the problems of printing from glass plates came too late to be of use. Glass plates were used, for example, in collotype (*Lichtdruck*), a planographic process, and *cliché verre*, a photographic process. Glass was not used for intaglio techniques, however. Nevertheless, printing from glass continued to intrigue printmakers. Materials improved – modern glass is more resistant to breakage – and the beds of roller presses are now made very smooth and flat, guaranteeing successful printing from glass plates.[104]

Plastics

The oldest type of plastic is celluloid, and the first references to its use in drypoint date from 1901. Émile Bayard claimed the process as *cellulotypie, procedé Émile Bayard breveté S.G.D.G.* and at the same time, Walter Ziegler published a short description in his manual.[105] Feliksa Jabłcyńskiego seems also to have invented the process in the same period.[106] Whosoever of the three may be the earlier, the material was found worth mentioning by later authors and marked the beginning of the use of plastics and plastic-coated boards as intaglio plates.[107]

The use of modern plastics, such as acetate and plexiglass for intaglio printmaking, started in the 1950s and was followed by a stream of references.[108] Plastics can be treated mechanically by means of scratching, sawing and cutting, by working with an electric drill and by heat such as with a flame torch or soldering tool.[109] Working on transparent plastic has the advantage that the design can be placed underneath the plate before being scratched into the plate.[110]

Plastics cannot be etched in the same way as metals, but some are sensitive to organic solvents. Ketones such as acetone can create particular surface textures.[111] A matted surface will give a light tone, but will last for only a few impressions because the plastic is too soft to withstand the abrasive action of the pigment particles in wiping. Textures can be created by dissolving plastic in toluene or xylene and modelling this paste on the plate's surface.[112]

Plastics can be engraved with a burin, but the material is often either too soft or too brittle. The edges of the grooves are not that sharp compared to engraving in copper and consequently they look more like drypoint lines in the print. In the 1990s new kinds of polymers became available that were better suited to engraving and could be applied for both printing in relief and in intaglio. The material, a kind of resin, is marketed as Resingrave™.[113]

Nylon or thin steel plates with photosensitive coatings were initially used in the printing industry, but became of interest to printmakers in the 1980s.[114] Known earlier as 'flexograph' and used for rather coarse relief printing on non-flat surfaces, more refined forms were developed in the 1980s that could be used for intaglio printmaking because no acid was needed to create the image. Another form are the photopolymer films, plastics mixed with photosensitive chemicals that were developed for the computer industry. Upon exposure to light the films harden. By covering with a positive or negative transparency, only the parts of the layer not covered are hardened, the unexposed soft parts are washed out with water until only the image remains, the rest is fixed and the result can be printed in intaglio or relief. Photopolymer films, which can be applied to supporting metal or plastic plates, became part of the printmaking studio by the mid-1990s.

Cardboard, linoleum, paper and wood

A material called *Glasspapier* was used for drypoint in the 1820s. Lines were drawn into its surface with a steel needle, and tones were made using a roulette. For printing the sheet was pasted to a plate of tin or ivory, or a smooth wooden plank.[115] *Preßspan* is thin compressed board, used in children's education a century later. Its smooth surface was scratched with a specially designed needle and the plate was printed like a drypoint.[116]

In the 1840s, the German Furchau suggested coating a plate made of linen or cotton with layers of boiled linseed oil and chalk. Plates could be produced in large sizes, the coating was flexible, and the material could be worked effortlesly – the plate was light and could therefore be easily transported. The use of paper or cardboard as a base material was also possible. Lines were drawn with a drypoint and printing carried out as normal. Tests proved disappoint-

ing, however, because the maximum print run that could be achieved was only 300, wiping was slower and edges drawn with thicker needles could crumble.[117]

The material sounds similar to linoleum – a compressed mixture of cork, chalk and linseed oil.[118] Linoleum was often used for relief printing from 1900 onwards, but can also be cut and printed in intaglio.[119] Its smooth surface allows wiping, the larger gouged areas are rough and hold ink to print tones. Its surface can be worked with a diluted lye (sodium hydroxide), which saponifies the oil and dissolves the chalk. The linoleum can be painted on using a brush with lye and after cleaning an intaglio impression looks like a watercolour, making it comparable to an aquatint technique.[120]

Printing woodblocks in intaglio is possible if the material, such as boxwood or palmwood, is dense and the block's surface is polished smoothly.[121] Mounting board, layered cardboard, masonite plates, plywood and softer kinds of wood, coated with shellac or acrylic varnish, as well as laminated paper used for milk and fruit juice cartons, can be cut, scratched and peeled to convert them into intaglio printing plates. Cuts made with a knife print as lines and tonal areas can be created by peeling off parts of the surface layer.

The combination of various materials pasted to a base plate is called 'collagraphy' (from 'collage' and 'graphic'). Its potential has attracted many proponents in the past half century, for which reason collagraphy is treated in more detail below.[122]

Other materials

Basically any material sufficiently hard to resist wear in wiping and printing may be used, provided its surface is smooth enough or is coated to prevent too much absorption of the ink. Ivory plates, for example, can be engraved when relatively fresh in order to create straight lines; when too old it is brittle, lines become ragged and the plate can break in printing.[123]

Limestone and marble can be etched easily, and are used to create tangible reliefs.[124] Historical etched stone plates with raised texts in reverse are assumed to have been used for relief printing.[125] Linear designs can be etched into lithographic stones but this method can only be used for planographic printing.[126] The method is not recorded as having been used in intaglio printing.

Plate production

Copper was melted from ore in a number of steps and shaped to ingots,[127] the ingots being hammered into the plates manually. The practice of hammering by machines powered by watermills dates back to the fifteenth century in some German towns, while in France this was performed only in the eighteenth century.[128] Hammering by machines was still practised in the nineteenth century.[129] Flattening copper plates in rolling mills developed only slowly over the centuries.

Hammering and rolling

After initial flattening, presumably by hammering, printing plates were cut to size and further hammered by hand.[130] Hammering was favoured by engravers because it gave their plates a more compact and homogeneous structure, which enabled better handling of the burin.[131] The plate expanded during hammering and was cut straight afterwards.

Engravers did use uncut plates, at least occasionally, as can be seen in some impressions. Early examples are found in the *Geographia* by Francesco Berlinghieri (1482). The 31 engraved illustrations show that most plate edges were curved and irregular with strongly rounded corners, meaning the ingots were hammered to plates and the plates used as they were: uncut and full size. Cracks due to hammering and traces of sanding are visible in most impressions.[132]

Something similar, although perhaps not the same, can be seen in some etchings by Anthony van Dyck that show irregular, wavy edges in their first states (see Fig. 117, the wavy edge of the uncut bottom edge).[133] whereas in the second states the plates are cut a few millimetres all around.[134] A further example is a plate with irregular edges depicted in the upper right corner of the frame around Goltzius's portrait of Coornhert (c.1592) (Fig. 114).[135] The difference between the earlier Italian plates and the later Netherlandish plates seems to be that the Netherlandish plates show a more regular character, with straight corners compared to the more rounded corners of the plates in the *Geographia*. Perhaps we are seeing plates that were hammered first, cut to size and hammered a second time especially for use in engraving, whereby the plates enlarged further.

Roller presses for printing engravings and for flattening soft metals either developed in parallel from a common ancestor, or the one developed after the other.[136] The harder metals, copper and iron, were traditionally hammered to plates. The softer metals, lead, tin, silver and gold, were flattened by roller presses at least as early as the end of the fifteenth century.[137] Such a machine can be seen illustrated in Pantheo's 1530 publication on alchemy (Fig. 115).[138] De Caus (1615) informs us that lead and tin were first cast in plates and next further flattened in rolling mills that look similar to the hand-operated roller presses used for intaglio printing (Fig. 116).[139] Reliefs are embossed in strips of

lead for keeping glass in windows and in precious metal for making coins by means of small mangles in the sixteenth century.[140] Small mangles for rolling strips of gold and silver were used by seventeenth-century goldsmiths and by instrument makers for preparing strips of copper and brass.[141]

There are indications for the rolling of copper plates in the seventeenth century and perhaps even before 1600, but it certainly was not in common use.[142] Rolling mills for producing larger copper plates are found more often in the second half of the eighteenth century, such as the factory for copper plates in Romilly (France), which opened in 1782. Such machines were not common, though, as they were not known in the United States before 1800 and not in Austria before 1820.[143]

Whether or not rolled copper plates were used is also related to the qualities of the metal needed for engraving and printing editions. A comparison with the rolling of iron plates is appropriate here. The Wallon iron producer Englebert des Presseux constructed a slitting mill (*fenderie*) for the production of iron rods in 1513, news of his invention spreading across Europe from around 1600.[144] An iron bar was heated until white hot (1300°C and above) and passed between two plain iron rollers powered by a water mill. The flattened bar was heated and passed again and again between the rollers until a thin plate was created that was sliced into strips by cutting wheels.[145] The iron strips were further processed and finally hardened for further use.

Similarly, a bar of copper has to be heated and run between rollers to flatten it to a plate.[146] This would have sufficed for painting supports, but the drawback of heating copper is that the metal becomes too soft for engraving.[147] A copper plate needs to be flattened when cold in order to make it more compact, tougher and wear-resistant. Hot-rolling a copper plate that is intended for intaglio printing is therefore not desirable and cold-rolling could only be performed when rollers could be turned with enough power to overcome resistance.[148] Rolling had the advantage that it produced copper plates of even thickness, so the plates did not need to be planished to level them.[149] In the course of the nineteenth century, copper and zinc plates could be rolled to 0.25 mm precisely and by the mid-twentieth century to micrometre accuracy.[150]

Cutting and bevelling

In most cases, plates are supplied cut to size according to the design to be carried out. Cutting can be done by running a needle or knife along a steel ruler a few times. The cut line is aligned with the edge of a table and the extending part is moved down and up until it breaks off. This can be observed in the lower part of the first state of Anthony van Dyck's etched portrait of Paulus Pontius. A line is deeply carved underneath the portrait, but the strip underneath has not broken off, which happened in the second state. The edges show small cuts or scratches at regular intervals that look like traces from cutting the edges, perhaps with a small handheld shear (Fig. 117). The coppersmith used heavy shears in the seventeenth century and perhaps earlier (Fig. 118).[151] Plates are cut with shears of various designs nowadays (Figs 119 and 120).

The plate edges are sharp when cut and will be rough after etching in areas where the acid penetrates the thin or damaged ground, therefore before printing they need to be bevelled and polished. Bevelling edges and rounding corners prevent problems in wiping and printing: the printer may cut his hand on a sharp corner in wiping the plate and rough edges retain ink, which shows in the print. Furthermore, a bevelled edge is required in order for the plate to be moved under the roller and for the roller to be gradually moved on top of the plate. When the diameter of the roller is too small and the plate proportionally too thick, the plate will halt at the roller and will not move underneath it. When enough felt is on top of the plate and the diameter of the roller sufficient, an unbevelled plate can be run through but the paper may break at the gap between the plate edge and the bed of the press. Sharp edges will cut paper and felt when running the plate through the press.[152]

Edges can be bevelled by filing them down to remove enough material. By passing a honing stone along the edges or scraping them, only the cutting edge will be taken off, which with thinner plates may be sufficient. Next a polishing steel is run along the edges to compress the burrs. Sharp corners are rounded with a honing stone or emery paper.[153] At a place and period during which relations between engravers and printers were sensitive, this task might have led to some heated discussion. Bosse is quite particular about it: bevelling the edges is the printer's job, but he complains that often they just print the plate in the state in which it is handed over to them.[154]

Plate formats[155]

The map of the world in Francesco Berlinghieri's *Geographia* (c.43 × 60 cm) and the *Interior of a Ruined Church* (c.71 × 51 cm) by Italian Bernardo Prevedari shows the large plate sizes that were available to Italian engravers around 1480 – and continued getting bigger.[156] Very large plates confront the printer with two problems: the size of the paper should be at least as large as the plate and the width of the rollers should be wider than the width of the smaller side of the (rectangular) plate. If the paper sheets were too small, the plate could be printed on two slightly overlapping sheets (see Fig. 21, p. 27).

Limits to the size of plate formats were reached, for a while, by the middle of the sixteenth century. The problem of producing even larger images was solved by cutting the image on different plates, printing these on separate sheets

and pasting them together to form the complete image.[157] Images of processions and pageants commonly comprise a series of plates, the impressions being pasted together.[158] The reproduction of the Trajan column by Leonardo Sermei in 1576 is exceptional: its 130 etched prints pasted together form, each with a width of about 44 cm, a roll of 33 cm high and well over 56 m long.[159]

Hieronymus Cock is thought to have worked in Italy in the 1540s. By 1548 he had set up a print publishing business in Antwerp after examples he would have seen in Rome, and he persuaded the Italian engraver Giorgio Ghisi to come and work for him. The engravers of the Ghisi family were used to bigger plate formats and Giorgio made some large prints for Cock; the first print he made in 1550 measured up to 51 × 81.5 cm.[160] Ghisi engraved two separate plates that were printed on two separate sheets and pasted together.[161] After he returned to Italy, production of extremely large prints continued in Antwerp but on a minor scale.[162] However, when Cock's former engraver, Cornelis Cort, arrived in Italy in 1565, the formats of his plates increased dramatically.[163]

Working on very small plates of just a few square centimetres is not very practical: it is easier to hold a format of, say, 10 × 10 cm or larger. The sensible solution is to engrave several smaller designs on one larger plate.[164] The plate could be cut before printing or printed as a whole and the images cut out of the larger sheets, a practice often seen with book illustrations of the eighteenth and nineteenth centuries (Fig. 121).[165]

Coppersmiths working in larger towns in the sixteenth and seventeenth centuries probably would have had enough customers to allow them to cut plates according to standard formats. Antwerp painters working on copper, for example, could buy standard plate sizes at that time.[166] The precision of the 'standard' formats supplied can be questioned, however, because even in the case of print series that require all plates to be the same format, differences of several millimetres up to one centimetre are common. As well as requesting a stock plate available in a range of sizes, an engraver could also ask the coppersmith for a specific format.[167] Standard plate formats were also available from suppliers of artists' materials in the nineteenth century.[168]

A plate of 12 × 9 *pouces* (c.30 × 22.5 cm) should be a *teston* thick – bigger ones should be proportionally thicker, writes Bosse (1645).[169] The Dutch edition (1662) translates *teston* as *halve Rijxdaelder*, and Adriaan Schoonebeek (1698) states that a plate of about the size of a common sheet of paper (32 × 41.5 cm) should be thinner than a *Rijksdaalder* (1.5–2 mm).[170] Similar measurements are given in eighteenth-century sources: a 12 × 9 inch plate should be about one line (1/12 inch ≈ 2 mm) thick.[171] Bartsch (1821) considered that a plate of 18 × 20 *Zoll* (c.46 × 51 cm) should be one line thick.[172]

In practice the plate should be thick enough to prevent it being cut or etched right through and of a size that allows for sufficient rigidity. Thickness is not related to the quality of the impression – thin plates can print as well as thicker plates.[173] Plates thicker than 2.5 mm may present a problem when they pass through a roller press. The bed may halt and the lower roller slip because it is not possible to move the plate underneath the roller.[174] It might succeed, however, with a strongly bevelled edge and extra blankets on the press.

Historical copper plates are sometimes reproduced in catalogues that give the height and width; thicknesses are rarely shown. However, the full dimensions of the majority of Rembrandt's copper plates were measured by Erik Hinterding. Thicknesses vary from 0.5 to 1.84 mm, the average being between 0.8 and 1.5 mm, which accords with the Dutch translation of Bosse.[175] Measurements of some of William Blake's plates confirm eighteenth-century references.[176]

Some really large impressions demonstrate just how big the formats of plates and paper could reach; it should also be borne in mind that the rollers of the press upon which plates are printed should be larger and the bed longer than the plate to be printed. German engraver Johann-Daniel Herz made some extremely large etchings in the third quarter of the eighteenth century. One particular plate – *The City of Jerusalem from Above* – measures 82 cm in height and 121.5 cm in width.[177] This concurs with the maximum plate format available in France in 1830 of 3½ × 4 ft (105 × 120 cm).[178] In 1770, James Basire was commissioned by the Society of Antiquaries to reproduce in engraving a painting illustrating the meeting of Henry VIII of England and François I of France in 1532: *The Field of the Cloth of Gold*. His plate measured 27 × 49¼ in. (67.5 × 122.5 cm).[179]

Modern plate formats in western Europe conform to 100 × 200 cm for copper and 100 × 225 cm for zinc. Copper is supplied in sheets of 2 × 8 ft in North America.[180] Roofing zinc in New Zealand is supplied in rolls of 10 m.[181] Plates are supplied in thicknesses of 0.2 mm gradations.

Pre-shaped plates and cut-shape plates
The majority of printing plates are cut rectangularly, as in most cases imagery is applied to a rectangular surface, but occasionally the plate format is adapted to its image. Two kinds of adapted plate formats can be differentiated: the 'pre-shaped plate' and the 'cut-shape plate'.

The pre-shaped plate is cut according to the design of the main composition with a small margin at the edges. Examples are the designs of cups and beakers by Bernard Zan (1584), which are suggestive of the final effects of these designs (Fig. 122).[182] Circular, oval and egg-shaped plates might be included in this definition depending on the concept of the design, such as engraved medallions.[183]

With cut-shape plates, the plate is first engraved or etched before being cut to shape, which may be regardless of

the design. Cutting a plate after the first state has been etched or engraved is sometimes seen and is carried out on aesthetic grounds, for example to remove traces of hammering or sanding (see Fig. 117).[184] Printmakers who design and etch their own plates often change the dimensions of the printing plate to suit the composition, Rembrandt being a well-known early example.[185] With modern printmaking this occurs frequently.[186]

Plates that are cut a short distance from the outlines of the design after engraving or etching form a grey area. Such plates look pre-shaped, but may be also be considered as cut-shape plates. Further research into earlier states or comparable works by the same engraver may clarify matters.

The opposite of cutting the plate is adding material or joining several pieces to create one plate (note this is different from jigsaw printing in which several loose pieces are laid next to each other on the bed of the press to be printed in one run).[187] In this case, plates are joined mechanically to make a new plate. Examples include plates cut by Thomas Geminus for a pirated edition of Andreas Vesalius's book on anatomy (Fig. 123). Geminus copied the illustrations on separate pieces of copper and locked these together to make one larger plate. The rivets holding the pieces together and the chinks between them are clearly visible.

Planing and polishing

Prepared copper plates were sold in larger cities such as Paris and London, and in some Dutch towns in the seventeenth century. In all other cases engravers would have been happy to leave the sanding and polishing of the plate's surface to the coppersmith or professional planisher.[188] Nevertheless, Bosse describes the process in detail in the event that no coppersmith is available.[189] English authors from the 1660s continued to provide this information.[190] If an engraver is reluctant to prepare his plates, someone can be found to do it for him.[191] Filleau des Billettes nuanced this in the 1690s (as did other authors up to the early twentieth century), remarking that the sanding is done by coppersmiths or specialised workmen, while the engraver only polishes the plate.[192] Nowadays copper and zinc plates are supplied homogeneously rolled and simply require some polishing before use.

The blows of the hammer also left dents as evidenced by the backs of many historical plates. Occasionally dents can be observed in impressions of poorly prepared plate surfaces, where they appear as darker, undefined round 'stains'.[193] The surface to be engraved or etched therefore first needed to be properly planished. The plate was fixed between nails on a table or workbench and the surface made level with a tool not unlike a plane.[194] The surface was sanded and polished in stages until it shone like a mirror. A sandstone with water was used to level the most obvious differences and then a block of pumice was employed to remove the scratches on the plate left by the sandstone. Alexander Browne divided this into two steps: using first the pumice followed by the 'moulton stone'. A block of charcoal in oil or water was then rubbed over the surface to further smoothen the blemishes.[195]

The plate was thoroughly rinsed after each step in order to wash off particles that might damage the surface in the next stage. The scratches were smoothened with a polishing tool, a piece of steel that was rubbed over the surface with some oil as a lubricant in order to compress the burrs and ridges. A tongue-shaped piece of steel, a few centimetres long, with a handle was available to copper engravers in the first half of the seventeenth century (Fig. 124; see Fig. 78, p. 92, to the left of the engraver).[196] Bigger versions with a handle that could be placed against the shoulder appeared before 1700.[197] In the eighteenth century a new model was introduced: a slightly curved piece of steel with handles on either side, which allowed the engraver to use his full weight.[198] Finally the plate was polished by rubbing its surface with a tightly rolled piece of felt and some oil. Bosse recommended sending the plate to a printer to have an impression made on blank paper – once an even tone had been achieved the plate could be considered really smooth.[199]

Plates continued to be prepared in this or a similar manner until the nineteenth century[200] when flattening copper plates using heavy rolling presses eliminated the problem of dents.[201] Simultaneously, machines were built for planishing the metal.[202] Now plate metal is supplied with a certain level of shine; further polishing with fine-grained, waterproof emery paper and finishing with a mild abrasive is all that is needed.

Protecting plates

Protecting the printing plate extends its life span, increases print runs and thereby profit. Engravers and printers went to great lengths to keep the plate in perfect condition, or at least to prevent it from being damaged, because of its economic value.[203] Wrapping a copper plate in a proof or maculature of the plate itself (for recognition purposes) was and still is common; such wrappers can sometimes be found in print collections (Fig. 125).[204]

Wrapping up the plate protects against mechanical damage,[205] helps to maintain a microclimate around the plate, shielding against rapid changes in humidity, and avoids the problems caused by condensation when plates are moved from a cool storage room to a warmer place; the dampness caused by condensation may enhance corrosion of the metal. The smallest plates are stored horizontally; larger plates are commonly stored vertically in printshops, leaving a little space in between the plates to avoid abrasion.

In principle, copper and brass plates do not require any coating when handled with proper gloves and stored dry.

They may discolour, but do not form a crust when kept dry and wrapped up in acid-free paper. Discoloration will not affect the impression and will disappear once printing commences because the plate's surface is polished by the pigment particles in the ink. Any formation of crusts on the plate is due to salts and water, or an atmosphere that contains sulphur compounds, ammonia or organic acids, as is visible in copper roofing and bronze statues.[206] Plates were stored in a dry place and rubbed with fat or oil to prevent corrosion.[207] Nowadays, etching ground, asphaltum varnish, Vaseline (petroleum jelly) and metal lacquers are used.[208]

Tin or pewter plates turn matt and will develop tin pest (visible as bulbous pitted crusts) if stored in cool conditions.[209] Zinc corrodes to white zinc oxide, then to white zinc hydroxycarbonate. In an urban air-polluted atmosphere it can also corrode to white zinc sulphide or another sulphur compound. Removal of corrosion crusts leaves indentations that show as pitted textures in the impression.

The disadvantage of iron and steel plates, and similarly that of steelfacing, is that the iron rusts very quickly. Rusting of early sixteenth-century iron etching plates is commonly visible in later impressions.[210] Again, in the nineteenth century, iron in the form of steel was favoured for printing plates. A steel plate may be hard, but like the iron plates of three centuries before, it also rusts, thereby losing its advantage over the traditional copper plate.

The mirror-polished steel plate must be well protected against rust immediately after printing.[211] The nineteenth-century introduction of steel engravings was accompanied by discussions about how to protect the plates. In 1822, the use of molten natural rubber (latex) or rubber dissolved in turpentine was proposed.[212] Charles Turner (1824) suggested rubbing the warm plate with sheep's fat.[213] Covering the plates with wax, wax mixtures, liquid grounds or varnishes was preferred, but it had to be done meticulously. The plates were stored in a dry place and at the first sign of rust every plate had to be cleaned and inspected. Rust was polished away and the plates were again covered and wrapped up in acid-free paper.[214]

By the twentieth century, zinc and steel plates were covered with shellac, asphaltum varnish and petroleum jelly.[215] Clear shellac lacquer allows the design to be seen, but it may crack and chip over time. A layer of asphaltum varnish is stronger and remains flexible, but it is too dark for the surface of the plate to be visible.

Jirí Cejka proposed protecting the metal plate with silicone oil, which works well in combination with protective wrapping.[216] Acrylic resists may be used on copper and have the advantage of being colourless, so the image can be seen.[217] The acrylic can be cleaned off the copper again with a mild alkaline solution. This is difficult on zinc, which corrodes much faster than copper when in contact with a base. Acrylic-covered zinc can be cleaned with a high-grade alcohol, but this works more slowly. Aluminium forms its own protective coating by oxidation, but in a marine climate the salty air may react with the aluminium causing further corrosion. Chromefaced plates do not corrode and wrapping up in paper to protect them from mechanical damage is sufficient.[218]

Solarplates and plates covered with photopolymer film have a relatively soft surface. The polymer layers darken to a deep purple and become a little harder over time, nevertheless they are still more sensitive to mechanical damage than metal plates. Such plates can be wrapped up, but the film forms blisters and may peel off after some time.

Recycling plates

Recycling or reusing plates can be done in various ways and for different reasons. One reason may be a change of mind by the engraver who, having already scratched his first design into the plate, discards it for another idea; the original scratches can, however, still be seen in the final impression (Fig. 126). Cutting the best, least-worked parts from an older plate provides an economic solution.[219] Another reason for reuse is that the plate represents an investment, its costs being related to the actual price of the metal and the financial situation of the engraver – historically as well as today, plates are still an investment.

Having served its purpose, the plate's surface could be sanded down and polished to be etched or engraved again;[220] an engraver might not have been able to afford to buy new plates or he may have lost interest in the work created. With the introduction of steelfacing an almost complete recovery of a copper plate became possible. Its surface was carefully coated with etching ground leaving the grooves open. These were filled by means of galvanisation and after cleaning and polishing, the plate was ready for use again.[221]

Another alternative is to use the back of the plate rather than reuse the front.[222] Nowadays this is not a real problem – the plates are rolled and are smooth on both sides therefore just polishing should be sufficient. In the past, however, copper plates were hammered, the front was sanded and polished but the reverse of the plate was marred by cracks and dents.[223] In order to reuse the plate, the blemishes on the back had to be sanded down and this side of the plate polished.[224]

Re-engraving and re-biting

A worn plate can be re-engraved in order to pull extra impressions from it.[225] When worn, the image looks forlorn with little contrast and faint lines. By cutting the lines a little deeper and wider, another few hundred impressions can

be pulled by carefully tracing the grooves with a burin. Much depends, however, on the intended quality of the print and the depth and width of the original grooves. With regard to quality, sometimes re-engraved lines were not cut within the original grooves, but adjacent to them, creating a rather hazy effect in the impression. In most other cases, the reworked areas of the plate exhibit a loss of their original subtlety – the widening of the lines results in a dark undefined image.

Re-biting an etched plate is technically possible but can be hazardous. The surface needs to be covered with ground or lacquer again in such a way that the grooves are kept open. However, the grooves may be (partly) filled with ground, which has to be scraped out before biting. Conversely, filling all the grooves with ground as well as covering the surface of the plate is possible, but the ground has a tendency to congeal leaving only a thin layer of ground at these edges, which will soon succumb to the action of the acid.[226]

The darker parts of mezzotints can be rocked with a small rocker or a roulette to raise some extra burr, but little more can be done without noticeably changing the original image.[227] Aquatint is too sensitive, and once worn it cannot be revived again. It is, however, possible to polish off a fine grain aquatint and etch another one instead providing the supportive etched outlines are sufficiently strong.

An exceptional phenomenon can be seen in plates by the Dutch artist Cornelis Apostool. When working in England in the early 1790s he produced etchings using Ploos van Amstel's transfer method, which was only used by Dutch engravers. The etchings appeared in Samuel Ireland's *A Picturesque Tour through Holland, Brabant and Part of France* (London 1790). For the second edition of 1795 the tones of this Dutch kind of aquatint were polished off – keeping the original outlines – and new aquatint tones etched, now by means of the liquid-grain process. Because the liquid-grain technique was only used in England at that time, the plates would have been re-bitten by an English engraver.

Artists occasionally rework their own plates or those of their colleagues. This does not concern restrikes (ie pulling later editions of older plates, which is relatively common) or states.[228] Reworking in this case means to radically change someone else's printing plate. For example, Rembrandt famously acquired the etching plate by Hercules Segers of *Tobias and the Angel*, scraped off the main figures and reworked it in drypoint to create *Flight into Egypt* (Fig. 127).[229]

Cooperation between two or more engravers to create the image on one plate is found occasionally, for example one may specialise in landscapes and the other in figures (Fig. 128). Texts in addresses are commonly engraved by specialists.[230] Modern printmakers may rework the original design or overprint the earlier impression with a new plate in such cooperation projects.

Finally, the reuse of plates for different purposes may also be encountered. Oil paintings may have been painted on the versos of engraved plates;[231] plates can be used as, or inserted in, book covers; framed for use as wall decorations; or given a new status as sculptural objects. Conversely, impressions can be pulled from decorative plates and medals originally not intended as printing plates.[232] Nineteenth-century researchers occasionally printed pre-1400 engraved plates in order to demonstrate the antecedents of intaglio printmaking (Fig. 129).[233] Nowadays printmakers utilise non-printmaking materials as printing plates, such as flattened tin cans, roof lead, milk cartons or *objets trouvés*. The materials are used because of their interesting shapes and textures, or further processed for printing. The next step is combining those materials in 'collagraphs'.[234]

Transferring the Design

It should not have been too difficult for the experienced etcher or engraver to make a freehand copy in mirror image of a model or a picture.[235] He could normally engrave his plate or draw in his etching ground freely without the need for a preliminary design. The etcher could make a preparatory drawing directly on the etching ground with soft crayon or brush and watercolour, taking care not to scratch the ground.[236] Commonly, however, sketches or copies of originals were transferred onto the plate one way or the other.[237] This process is not new: the copying of one image to reproduce it as (part of) another image in drawings and paintings was used in Europe from Carolingian times. Transferring a design was known in China from at least the ninth century AD and there is also evidence for its use in Egypt from the fifteenth century BC. A number of transfer techiques were in use by draughtsmen, painters and printmakers alike, such as tracing, pouncing and squaring.[238] More refined transfer techniques have been developed for intaglio printmaking, a summary of which follows.[239]

The print does not usually reveal the type of transfer technique used. However, comparable to the underdrawings of paintings, engravings sometimes show lines lightly scratched into the plate that divert from the actual engraved lines. Similarly they can be described as *pentimenti* (see Fig. 126). Such *pentimenti* are unlikely to be seen in etchings as the design is first transferred onto the etching ground which is removed after etching, leaving no trace.[240] Likewise a design may be transferred in different ways and therefore only occasionally can the process used be deduced, espe-

cially as surviving designs that exhibit visual evidence of a transfer process are rare.

When the etching or engraving was made after an original design or a drawing after a painting or sculpture, the quality of the image in the final print was largely dependent on the skills of the engraver, therefore a thorough training in drawing was considered important. The engraver always interpreted the original in his own way, however, which might have led to discrepancies.[241] It was only with the introduction of photography in printmaking that personal interpretation of an original was limited, although here, too, retouching as well as the quality of the analogue or, nowadays, the digital picture from which the printing forme is derived still depends on personal interpretation.

Tracing

A common way to transfer a design onto a plate to be etched is to rub some black crayon on the verso of a preparatory drawing or print. Instead of using the verso side of the drawing, a second sheet of paper can be placed between the drawing and the plate and rubbed with a crayon. Nowadays ready-prepared carbon paper or dressmakers' pattern paper is used, with the same effect. The paper is laid on the printing plate covered with etching ground, and secured to it with some wax or folded around to fix it in place. The outlines of the design (drawing or print) are traced with a blunt point, leaving indentations in the traced lines.[242] By this action crayon powder is transferred onto the etching ground. After lifting the paper, black lines can be seen on the golden brown ground. The engraver traces these lines again with a needle and the plate is ready for etching (Fig. 130).[243]

A further step is to place carbon paper underneath the drawing but with the coloured side up. By tracing the drawing, the outlines appear in mirror image on the verso side of the drawing. These lines are then traced to transfer them onto the printing plate and the impression becomes 'normal' again.[244] If no indentations can be found, but the outlines of the design are visible on the verso side, the drawing was probably traced by placing it face down on a light source or against a windowpane in order to view the design from the back.[245]

If the engraver does not want to work on the recto or verso side of the drawing he can use transparent paper. This is placed on the drawing and the outlines visible through it are traced with ink or crayon. The actual transfer process is then done by tracing or by offsetting the drawing onto the transparent sheet. One variation is to make a copy in crayon of the original drawing, place it face down on the plate, rub the back with oil to render the paper transparent and trace the drawn lines to make an offset of the crayon lines in reverse.[246]

Because the crayon of the traced lines does not stick to blank metal, the copper plate to be engraved is first covered with a film of wax. The drawing is traced, the crayon sticks to the wax and the lines are scratched lightly into the plate's surface with a drypoint. Next the wax is removed by heating the plate and rubbing it off with a cloth, after which the plate can be engraved. The engraver will follow the drypoint lines, but corrections can often be seen because the scratched lines are still visible as *pentimenti*.[247] Hatching in the design is not copied from the drawing, but is completed according to the engraver's interpretation. As a guide to horizontal or vertical hatching, first some straight drypoint lines can be drawn using a ruler, which are then followed in engraving.[248]

The etching plate provides opportunities to increase the contrast between crayon lines and ground, because the ground can be covered with a black or white layer. In order to blacken or smoke it, the plate is turned at an angle with the ground facing down, a burning wax candle moved underneath melts the ground and the soot of the smoking candle sticks to it.[249] The ground is covered with a dull black layer after cooling. Bosse illustrates the use of a normal candle with one wick (Fig. 131). By 1800 a number of wax-covered wicks twisted together were introduced, which together create a lot of smoke that quickly covers the ground with soot; this technique is still used today (Fig. 132).[250] A transfer in red, or even better, white crayon contrasts excellently with this black layer.[251]

Smoking the plate improves the visibility of the lines of the design. When the etching needle is drawn through the blackened ground the metal is laid bare and the shiny copper contrasts strongly with the surrounding matt black ground. When using this method, the etcher has to remember that he is drawing in the negative, making light lines in a dark background. He has to guide his needle accordingly, because drawn lines may seem wider than they actually are and the lines in hatchings may have to be drawn more closely to each other.[252]

In order to give the ground a surface closer to the white of the paper of the original design or eventual print, the engraver can cover it with a white watercolour paint upon which he can trace the design with red or black crayon, charcoal or pencil.[253] The copper in the drawn lines will therefore appear reddish against the white surface colour.

An early reference to this technique can be found in a letter dated 19 June 1622 from Pieter Paul Rubens to Pieter van Veen. Rubens expresses his delight that Van Veen had found the recipe for a white ground that he once saw Adam Elsheimer use.[254] Sadly Rubens does not give any technical details, for which we have to look to later sources. A solution of gum arabic is mixed with some lead white to make a watercolour paint and the addition of a few drops of oxgall prevents reticulation of the paint on the ground. The paint is brushed on the ground and left to dry.[255] Instead of gum arabic, Faithorne prescribes starch in his English translation of Bosse's treatise.[256] Although, according to Hendrik Schwegman, the use of white grounds had declined by the end of the eighteenth century, recipes for white

grounds are found in nineteenth-century manuals, new kinds even being invented then.[257]

The coloured grounds described by John Bate (1634) are typical. Instead of covering an etching ground with a black or white layer, he offers recipes for red, white and black grounds. These recipes explain how to mix grounds with pigments and are occasionally copied by other English authors.[258] It does not seem likely they were often used in practice, however, because mixing pigment particles with an etching ground can make the ground porous and more sensitive to penetration by the acid, resulting in foul biting.

From the seventeenth century, recipes for carbon paper, transparent tracing paper and gelatin sheets for transferring designs were often recorded in connection with etching and engraving techniques. These recipes probably date back to the fifteenth century. The earliest known descriptions for making transparent parchment and paper, and gelatin for tracing designs, are given by Cennino Cennini (c.1400).[259] The many later recipes for the preparation of transparent paper mention the use of oils, turpentine, spermaceti or naphtha, with which paper should be permeated in order to make it transparent.[260]

Pouncing

In this method the sheet is perforated with needles along the outlines of the design.[261] The sheet is then placed on the plate and charcoal dust pounced through the small holes onto the surface underneath. The sheet may also be first perforated with another sheet underneath, this sheet in its turn being used in the actual pouncing. The pouncing leaves a series of black dots on the wax layer of the plate to be engraved, or on the (whitened) etching ground. The dots are then traced with a drypoint for engraving or with an etching needle respectively. An anonymous seventeenth-century (?) author recommends pouncing as a way 'to make an etching after a print without much trouble, even if you cannot draw'.[262]

The drawback of pouncing the original drawing is that when pouncing the front of the sheet, the drawing becomes invisible due to the residual charcoal, in which case it makes more sense that a second sheet underneath the original would have been pricked and then used for pouncing. Perforated drawings and prints from around 1500 onwards, especially prints bound in volumes that show no sign of charcoal dust, seem to suggest this process.[263]

It is also possible that the design would have been pricked directly into the plate underneath, leaving a series of holes in the metal. This is arguably observed in some engravings such as a Pegasus by Jacopo de' Barberi (Fig. 133). To the left of Pegasus's left wing is a series of dots that could be due to needling the design directly into the copper. The engraver would have then altered his plan, scratched a row of dashes in the plate farther to the right and engraved the wing accordingly.

Squaring

Domenico Tempesti, mentioned above, described the squaring of a drawing as a technique used by engravers and painters alike to enlarge or diminish the design.[264] In this process the drawing is divided into squares by horizontal and vertical lines running at regular intervals. A smaller or larger drawing is begun with the same number of horizontal and vertical lines. The engraver copies the outlines in every square of the original in the corresponding square of the copy, which can then be transferred onto the plate. Various descriptions of the technique exist, and squared drawings and prints have survived. John Hassell chose to explain his reference to squaring with an illustration rather than giving detailed written instructions (Fig. 134).[265] He showed how a smaller drawing can be enlarged and a larger drawing reduced while keeping the same proportions.

A drawing or print with a grid, however, does not indicate whether it was used specifically for making a print. Stronger evidence is provided if the outlines and the grid are on the back of the sheet. This means that the design was traced against the light and then squared for copying as a mirror image. Once printed, the design would be the correct way round (Figs 135–137). Squaring a painting can be done in two ways. When the painting is varnished and framed a grid can be painted on top of the varnish using a watercolour. A drop of oxgall mixed in the watercolour prevents its reticulation on the varnish and the watercolour can be cleaned off again with a damp sponge afterwards. Alternatively, in order to avoid touching the paint itself, threads can be stretched over the picture from top to bottom and from left to right, and pinned at the edges of the painting.[266]

Offsetting

A simple means of reversing the design is offsetting the original or its tracing. A crayon or pencil drawing is lightly moistened, placed on the plate covered with etching ground or, for engraving, a thin layer of wax and the whole run through the press.[267] When a press is not available this can also be done by firmly rubbing the back of the drawing.[268] Powder from the crayon or pencil lines sticks to the ground or wax when the paper is removed, revealing the design. In order to preserve the original, the design is traced onto transparent paper, or thin paper is traced against the light, and this is offset onto the printing plate.[269]

Another way to make reversed offsets is by using leaves of gelatin. A leaf is placed on the drawing and the image is scratched into the gelatin with a sharp needle. Any burr is scraped off, fine crayon powder or graphite is rubbed into the scratches and the surplus brushed off. The leaf is turned over, placed on the plate and rubbed from the back with a drop of oil as lubricant and a polishing steel or a tooth to transfer the crayon.[270] Josef Roller (1888) used *Gelatinepapier* for this – a highly transparent paper that can also be run through the press with gentle pressure.[271] A variant is rubbing the gelatine sheet with sulphur powder. The copper plate is covered with a film of fat instead of wax and the sulphur offsets from the gelatin onto the plate. Upon warming the plate the sulphur and the copper react chemically and the lines appear black.[272]

Making a counterproof of a freshly pulled impression is a typical printing technique.[273] When making a transfer, the fresh proof is placed on another plate and the whole run through the press. The counterproof renders the reversed design in every detail, making it an ideal way of replicating a plate in order to extend the print run (see Figs 260 and 261, pp. 322 and 323).[274] In modern printmaking this is commonly used to prepare plates for multiple-plate printing.

Counterproofing was also used for older prints. A newer print would be slightly dampened, the copper plate rubbed with wax, and both the paper and plate run through the press. Enough ink would offset from the print to be able to see the details.[275] Impressions could also be taken from already hardened ink lines. The ink of an old print was saponified by soaking the print in a mild lye or soap.[276] This softened the dried oil varnish in the ink, which then could be offset onto the plate.

A variation of counterproofing, for copying the outlines of a painting, is described by Jacque Christoph Le Blon (1756) for use in the preparation of the plates for his colour printing method.[277] A window the size of the mezzotint plate was cut out of a sheet of cardboard. Finely woven fabric was stretched over the window and sewn to the cardboard. This was placed face down on the surface of the painting, its outlines were traced onto the fabric with a fine brush with white oil paint and the paint was left to dry. A watercolour was prepared by mixing white pigment (chalk?) with alcohol and some oxgall. The lines in oil paint on the gauze were traced with this watercolour, the cardboard frame placed around the copper plate and the gauze pressed against the rocked plate surface in order to offset the watercolour against the plate's surface. This was repeated with all the other plates.[278]

Instead of a frame with a gauze, a transparent paper can be placed on the original. The outlines of the painting are traced with red crayon or a mixture of vermilion in water, the sheet is placed face down on a ground plate and the whole run through the press to offset the design on the etching ground.[279]

A direct method is found in the manuscript by Mattheus Verheijden (1736–1739).[280] A water-soluble mixture is made from the white of an egg and writing ink. The outlines of the design of the painting are traced with this mixture, damp paper is placed on the painting and the whole covered with dry paper. The dry sheet is rubbed until the lines offset onto the damp paper; the remaining egg mixture is washed off the painting with a damp sponge. The offset image can in turn be transferred onto the printing plate, for example by rubbing the back of the paper with crayon powder and tracing the lines, or by tracing the offset onto transparent paper and using this for transferring.

Photography

With the introduction of photography, photographs were used in much the same way as drawings, ie they were traced and the outlines transferred onto the printing plate. Photomechanical techniques such as photogravure were used to transfer a design and etch it into the printing plate. The process by itself is sufficient to reproduce the original more perfectly than can be achieved by any transfer technique. Some artists went a step further by using the photogravure process to turn their drawings or watercolours into printing plates on which they continued to work.[281]

In modern transfer techniques, a photocopy – either in negative or positive – of the original is made. This is dampened, touched up with a solution of asphaltum in natural turpentine, rubbed with diluted gum arabic and rolled with ink, just as a lithograph is prepared for printing. The paper is placed on the plate, the whole run through the press and the paper peeled off; after drying the ink is acid-resistant and the plate can be etched. A variation involves printing the photocopy on the plate and covering the plate with a thin layer of transparent shellac varnish. When the varnish is dry, the plate is rubbed with white spirit to dissolve the ink underneath. Another method is offsetting the toner of a laser printed image onto the printing plate by means of heat.[282]

Image and mirror image

With the exception of offset lithography, stencil techniques and digital printmaking, all printing processes typically produce impressions in reverse. Examination of historical prints suggests that it apparently did not matter much, even with portraits, whether or not prints were reversed.

Some written evidence documents that in some cases care was taken to ensure that the final print was the right way round. Nicolaas van der Horst wrote a note – under his drawing of *Maria de Medici's Entry into the Palace at Brussels in 1631* – asking the engraver to cut the plate in reverse. To this end his preparatory drawing should be transferred in reverse onto the plate, for which Van der Horst recommended that the engraver should either hold it up to the light by sticking it to a windowpane or soak it with oil, thus making the drawing visible from the verso side.[283]

To obtain an impression that was the right way round, the engraver could cut or etch the design in mirror image into the plate, as Van der Horst requested. Several of the transfer techniques mentioned above are appropriate. For example, the engraver could place a sheet of transparent paper on the original, trace the outlines, turn the sheet over, lay it on the plate and trace the outlines again, which would make the design appear in reverse on the plate.[284] In the impression the design would then be 'normal'. A mirror might help the engraver to compare the original to the work on the plate, although he should be able to manage without because working in reverse was, and is, common in printmaking.[285]

Draughtsmen such as Johannes Stradanus, Hendrick Goltzius and Jan Luyken often drew preparatory designs in reverse. The engraver simply transferred the design straight onto the plate. He could follow the model exactly while engraving or etching it, therefore the print would be correct (Figs 138 and 139). Perhaps here we can find a clue as to why the designs in so many prints are in reverse. The engraver placed the design next to his plate and engraved or etched according to the design. This would have been relatively easy because there was no need to reverse it or 're-think' the model to mirror image.[286]

A typical example of paying attention to working in reverse is found in the Dutch translation (1662) of Bosse's treatise. Here all the plates of the original edition were copied in mirror image except for numbers 5, 9 and 10 (which appear opposite pp. 32, 74 and 77 respectively in the Dutch translation), because they show right hands working.[287] A clear case is plate 19 of the third French edition (1745) of Bosse's treatise.[288] The etching shows the working bench of the plate printer and from our left to the right we can see the ink stone, the heater and the jigger (see Fig. 226, p. 285). The line underneath the image notes, however, that the ink stone and the heater should be on the right and the jigger on the left.[289] This correction is observed in the copy for the German translation and in the copy accompanying the item on plate printing in the *Encyclopédie*.[290]

The compiler of a German book of recipes (1703) describes how to regenerate the ink on old prints, which can then be offset onto a blank sheet of paper. He remarks that text pages can also be copied in this manner, although a mirror would be needed to read the text now written backwards. In his opinion this is less of a problem for reversed images.[291]

According to Heinrich Wölfflin certain principles prohibit the reversal of compositions.[292] There are, however, clear cases where the artist reversed the original design for the sake of the composition. The setting of the original sketch of Jean-Baptiste Greuze's design for *Le Fils puni* (1778) was made to look more dramatic and the composition turned 180 degrees for the final painting.[293] The question is: why do we see the phenomenon so often in intaglio printmaking, both in reproductive prints as well as in the works of artists who printed their own designs and even in the portraits they made?[294]

In the case of Dürer, Christine Vogt concluded that although he seemed to have been aware of the problem and took great care to ensure that the print showed everything the way it was supposed to be, in many cases he was indifferent.[295] In Goltzius's series of four engravings of the *Story of Lucretia* (c.1578), somewhat puzzling is the fact that the preparatory drawing for the first plate is in reverse but not the second.[296] Raymond Keller observed that of the 57 reproductive engravings Rubens had made after his paintings only five were not reversed, although all were made under his supervision.[297] Adam von Bartsch, himself a professional engraver, remarked that 'if the engraver wants the prints to be in the same direction as the originals, the plates have to be worked in reverse'.[298] In other words, Bartsch did not think it always necessary to engrave the plate in reverse.

Rembrandt is infamous for showing Christ raising Lazarus from the dead with his left hand and for similar usages of the left hand when the right hand seems obligatory; even the use of both right and left hands can be seen in some prints.[299] The preparatory drawings of the *Portrait of Jan Six* show that he transferred the design straight from the drawing onto the plate, and in the print the design is in reverse.[300] He did not seem concerned – paying more attention to the effects of the image as a whole rather than the minor details.[301] And what is more, patrons accepted it, as Rembrandt was commissioned in 1655 to etch a portrait of Otto van Kattenburgh of the same quality.[302]

The mere presence or absence of traces of some form of transfer process on an original drawing cannot be regarded as definite proof of whether or not the drawing was copied in reverse. Various techniques or combinations of techniques are available to the engraver to produce a mirror-image plate with little effort. It could be argued that not all techniques were known from the beginning of intaglio printmaking, or by all printmakers, and an engraver's possible lack of interest in the problem should also be taken into account. Nevertheless the question remains as to why engravers chose both to correct as well as to retain the reversed image. The conclusion must be that in most cases neither the engraver nor his audience regarded the matter as being of any importance.[303]

Mechanical Procedures

The differences between the training of engraving and the training of etching is reflected in the manuals published. There are but a handful of monographs on the technique of copper engraving and most authors of printmaking manuals devote only a few words to the subject of engraving, if at all.[304] Consider, however, that mastering engraving takes years of training and is not something that can be learned by just reading a book. Discussed here are mechanical procedures for making intaglio printing plates. The tools, materials and techniques used to create continuous lines, tonal areas or crayon-like textures are discussed below.

Line

There are two main mechanical means by which a continuous intaglio line can be produced: scratching and cutting. Pulling a sharp point through the plate's surface towards the body (scratching) draws a groove and at the same time raises burrs to the left and the right of the groove; this is the so-called 'drypoint' technique. The other method – pushing a burin away through the plate's surface (cutting) thereby removing material – is termed 'engraving'.

Drypoint

The basic drypoint technique simply involves scratching the plate's surface with a hard and sharp point of round section. A sharpened steel needle performs well; more durable are points made of hard precious or semi-precious stones such as diamonds or rubies set in steel pens.[305] Less expensive than diamond points, as effective although not as long-lasting, are modern steel pens with a 'widia' point.[306] Other sharp tools may be used, too, such as knives, scraper blades and steel nails.[307]

In pulling the point through the plate's surface metal is pushed aside, and burrs rise on both sides of the groove. Straightforward scratching raises burrs of equal height to the left and right. By tilting the tool to the right more burr is raised on the left and vice versa. The plate is rubbed with a mixture of tallow or Vaseline and some black pigment, black oil paint or just some black printing ink to get an idea of the developing image during engraving.[308]

Scratching the initial design in the plate to be engraved was common and often its remaining scratches can be seen as guidelines for the burin.[309] Drypoint lines can be a deliberate part of an engraving. When the burrs are scraped off only thin grooves are left that are suitable for the more delicate (lighter) parts of an engraving, such as fine details, tones on human skin, water, sky, drapery and for architecture.[310]

In creating a complete plate using the drypoint technique in the way described by Bartsch (1821), the surface of a plate is scratched with the point and all the burrs are scraped off.[311] Edlem von Keeß (1823) describes how the burrs of the first lines are also scraped off, but the others are left in order to achieve certain picturesque effects.[312] For modern printmakers it is the burr and its effects in printing that play a major aesthetic role. A clean wiped, deeply cut drypoint line can show an ink line in the middle with thin un-inked lines at either side (the tops of the burrs) and beyond that fading inked lines. More typically this fading is used to create characteristic lines by playing with the amount of ink left behind the burrs.

Leaving the burrs ensures that extra ink is retained behind the raised metal when wiping the plate. The print shows lines wider than just the grooves. The edges of a printed drypoint line are undefined because the ink is wiped from the surface of the plate behind the burrs instead of being retained in the grooves only. Impressions from drypoint plates are therefore described as 'velvety'. Drypoint burrs do not last long – they quickly wear in wiping, break off and are flattened in printing.[313] The grooves remain but the velvety effect disappears and the shallow grooves leave only meagre impressions. Steelfacing copper or zinc plates gives the burrs greater resistance to wear caused by wiping but does not prevent them from being gradually flattened in printing.[314]

Pure drypoint prints showing the characteristic velvety lines are rarely seen before the later nineteenth century: first because graphic techniques were aimed at printing editions in large numbers for which drypoint is unsuitable and secondly because, with the exception of Rembrandt, a 'clean' line was required. We come across it, though, where the stylus has been used by inexperienced engravers – such as cartographers and mathematicians who wished to illustrate their own publications – instead of using a burin.[315] Because they were not trained as engravers and had no artistic intentions, they often drew straight lines using a ruler or circles using the steel points of a pair of compasses to scratch into the plate's surface (Fig. 140).

Using drypoint

Drypoint has a particular potential, which attracted the attention of early engravers. When a longer print run is not required, a scratched line is as valid as an engraved line, as shown in fifteenth-century prints where drypoint hatching was used to suggest volume (see Fig. 30, p. 32).[316]

Hercules Segers first etched his landscapes and in the second state, created tones by drawing series of drypoint lines next to each other or by cross-hatching them.[317] The lines are thin and it is more the ink left behind the burrs that prints the tone than the hatching itself. Also, Segers's handwriting is usually somewhat tense in contrast to the drypoint lines that look as though they have been drawn using a ruler. He is therefore wilfully creating a tonal effect by scratching the plate.

Rembrandt was the first to realise the full potential of the dramatic effects that can be created by the ink left behind the burrs (see Fig. 260, p. 322). The early proofs of his drypoint plates are rich in tone.[318] Later proofs – probably printed by professional plate printers not working under his supervision – appear stark and unimaginative, although there was enough burr left. The printers did their usual job of printing a plate cleanly, but creating tonal effects by leaving more or less ink on the plate was not part of their job.

The possibilities of drypoint were explored by printmakers from the second half of the nineteenth century (Fig. 141). The American James McNeill Whistler studied etching in the late 1850s in Paris and started to use drypoint then. His English brother-in-law, Seymour Haden, practised drypoint from around 1860, after which other English artist-etchers adopted the technique.[319] According to Lalanne (1866), drypoint can be used when fine lines are needed: one scratches the lines into the metal and next scrape off the burrs.[320] This is still similar to its earlier use by copper engravers, but a decade later French Impressionists left the burrs in order to fully utilise their potential.[321] They also advanced technically in the sense that their plates could be steelfaced to withstand pulling editions of a few hundred; enough to supply the market. German expressionists also appreciated the drypoint technique as it was so straightforward. It is now part of the artist-etcher's standard practice.

Engraving

The copper plate to be engraved is warmed, a film of wax is rubbed on its surface and left to cool. The design is transferred, the crayon powder sticking to the wax. The engraver traces the lines with a drypoint, lightly scratching into the metal. When finished the wax is removed by warming the plate again and rubbing off the liquid wax with a cloth or alternatively with some solvent.[322] Now the plate is ready to be engraved.[323]

The burin

Engraving is performed with a so-called 'burin', a simple instrument consisting of a thin straight steel shaft set in a handle.[324] The shaft commonly has a quadrangular- or lozenge-shaped section with its face cut obliquely at an angle between 30 and 55 degrees to form a sharp tip where the sides meet. The other end of the shaft is set in a handle usually shaped in the form of a mushroom that sits comfortably in the palm of the hand from which it is pushed forward.[325] A section with the lower sides of the shaft forming an angle of 90 degrees is common. When the lower sides form an angle of 70 degrees or less the burin will cut relatively finer lines and more subtle hatching.[326] Wider lines are cut deeper with a burin with a sharper section.

Burins of round or oval section called 'scorpers' are described by Theophilus (c.1100–1125).[327] Scorpers are suitable for removing larger amounts of material such as gouges in woodcutting. Their grooves can only retain a small amount of ink because they are shallow, so are less practical for cutting printing plates. Nevertheless, burins with triangular, flat-bottomed or curved-bottomed sections became available in the eighteenth and nineteenth centuries, the different sections being used depending on their purpose.[328]

The burin in its simplicity is an almost perfect instrument, which from Theophilus's description to the present day has hardly changed in form. Vasari (1568) was the first author since Theophilus to refer to the tool – Theophilus writing about burins for decorating metal objects, Vasari briefly mentioning the use of a burin for engraving *nielli* and intaglio printing plates.[329]

Over time a large variety of types of burins for specific purposes were developed and the quality of the steel has been improved, but the basic shape remains the same: a steel rod of lozenge section of about 10 cm long set in a mushroom-shaped handle on one side, its cutting end (shield) cut down obliquely away from the handle (Fig. 142). The top of the shield may be filed flat to shape a more comfortable position for the index finger. The only change made in the nineteenth century was bending the shaft to a 30-degree angle just below the handle for an ergonomically more efficient grip, allowing the hand to travel freely over the surface of the plate. First examples appear early in the nineteenth century becoming common after the beginning of the twentieth century, although straight burins can still be found (Fig. 143).[330]

A good quality type of steel was needed for the shaft.[331] Knowledge of hardening and sharpening is an essential prerequisite for good performance of the tool, and thereby for the smoothness and neatness of the grooves, and ease of engraving.[332] The cutting tip of the shaft was hardened (tempered) by heating the metal to a yellow straw colour (c.1100°C) to achieve the ideal degree of hardness – not too soft and not too hard.[333] Hardening the steel in this manner is superficial – during use so much material is honed off that the tip will require hardening again.

With the introduction of massive steel (see below) engravers no longer needed to harden the tips of their burins but they still needed sharpening, requiring the engraver's full attention.[334] On average the angle of the shield is filed

down to some 45 degrees. Steeper angles are common and sharper tips are only used for refined work requiring minimum force in engraving due to the risk of the tip breaking off.[335] The three sides of the tip were honed on a stone with some olive oil in the past and with a mineral oil today (Fig. 144).[336]

Illustrations of the interiors of engravers' studios commonly show that the copper engraver had a number of burins lying around on his desk (Fig. 29, p. 31, Fig. 67, p. 79, Fig. 70, p. 82, Fig. 75, p. 88, Fig. 78, p. 92, Fig. 79, p. 93, Fig. 80, p. 94, Fig. 81, p. 94, Fig. 84, p. 97, and Figs 147–151).[337] If working with only one burin, its point needed to be sharpened every ten to fifteen minutes therefore an engraver would sharpen some burins in advance to avoid any delays while working. Burins with sections of various widths are available: blades with a lozenge section of a wider angle cut wider lines; blades with steeper angles cut finer lines; and curves are more easily engraved with thin blades.

As already mentioned, the tip of the burin needs to be kept sharp so honing stones were usually located close to the engraver's working area, if possible with a small bowl containing oil (see Figs 144 (III, IIII), 147 (H) and 151; see also Fig. 27, p. 30, Fig. 78, p. 32 and Fig. 79 (i), p. 93). A variety of stones for sharpening tools was mentioned, for example, 'the oil-stone, must be of the Turkey sort'.[338] Arkansas stone, which is both hard and abrasive, is currently used for honing the steel. Some historical copper plates show evidence of the engraver having tested the sharpness of a burin on the back of the plate, a common practice.[339]

The introduction of steel printing plates before 1820 created new requirements: the steel of the burin needed to be harder and the points more enduring.[340] The discovery of new metals saw the introduction of new alloys, such as steel alloyed with rhodium. With these new alloys massive steel could be produced instead of iron hardened only superficially.[341]

The length of the shaft of the burin for engraving copper was c.10 cm, while for engraving steel it was around 8–9 cm long.[342]

Handling the burin

The burin is held between the thumb and the tips of the middle, ring and small fingers of the right hand. It is pushed from the palm of the hand by moving the arm forward and guided using the tip of the index finger (Fig. 145).[343] Straight lines are cut by pushing the burin away from the body, curved lines by pushing the burin and at the same time turning the plate (Fig. 146). Dots are made by holding the burin almost vertically and carefully 'ticking' into the plate. The skilled engraver is able to cut the minutest details, but occasionally punches are used for small circles and semicircles, letters and cyphers.[344]

The point is first 'dipped' in the plate's surface and then the burin is guided parallel to it. Some metal, which forms curls in front of the burin, will be removed in engraving. This excess metal will be removed when the burin 'surfaces' again and the line will end pointed; if the engraver stops while engraving a line, the curls of metal will remain attached to the plate and have to be cut off, in which case the line will be squared, or, if not well defined, more rounded or drop-shaped. In the print, the start of an engraved line therefore always looks sharp, while the opposite end can be either sharp or square. The same groove can also be re-engraved beginning from the other side, which may give a line with two square ends. As well as removing metal, some material is also pushed aside to form modest burrs to the left and the right of the groove, which will wear off in polishing or during the first printing.

Bosse (1645) was the first to, briefly, describe the technique of engraving. He regarded it as more complex than etching and the technical aspects difficult to explain, and suggested that a visit to a professional engraver would be helpful. He therefore just described the basics, demonstrating the sharpening and handling of the burin.[345] The Florentine Domenico Tempesti, who studied under Robert Nanteuil in Paris in 1677–1680, compiled a manuscript during his apprenticeship years. Tempesti's notes are detailed, for example, showing the different ways of cutting the tip of the burin.[346] This reflects the knowledge and habits of Paris engravers in the period, but his manuscript was not intended for publication and the information was not published until recently.[347]

Bosse's directions on engraving are summary. When Charles-Nicolas Cochin the Younger edited the 1745 edition of the treatise he remarked that Bosse had largely neglected instructions for engraving. He therefore extended the subject with advice on rendering different materials, architecture and landscape, which he had taken almost literally from Florent le Comte (1699).[348] Cochin in his turn was followed by the article on engraving in the *Encyclopédie*, lavishly illustrated – and much copied by later authors – with the tools needed.[349]

Other seventeenth- and eighteenth-century manuals do mention engraving, but rarely go into details. The anonymous *Neu vollständiger Reiß-Buch* (1707), for example, summarises in 26 points the techniques of etching and engraving, but although adequate, the text is not suitable as a 'teach yourself' manual.[350] The tools of engraving are mentioned and illustrated in Jean Guélard's completely engraved – images as well as texts – book on crafts (1743) (Fig. 147). The necessary tools lie around on the table: ruler, compasses, a drypoint, several burins, a polishing tool, a honing stone, a bottle or bowl of oil, and a piece of cloth to rub some blacking in the grooves for clarification of how the print will look (see below under 'Other tools').[351]

The first extensive description of engraving is found in Aristide-Michel Perrot's reference work (1830) about the state of the art of engraving and etching[352] and Henri Dubouchet (c.1891) gives some concise engraving lessons.[353]

Monographs on the technique of engraving were not published until the twentieth century.[354]

Plate supports

The way in which the engraver worked on a slanting desk is described above.[355] Usually he tilted his plate during engraving, which could be done in various ways. The oldest depictions show how the plates were held with one hand and the burin guided with the other hand (Figs 148 and 151; see also Fig. 27, p. 30). It is possible that the plates rested on some kind of support, but this is not depicted.

A plate support, not described in detail in any source, is a sphere on a foot or stand. It must have been a common device, available in several versions, given how often it is depicted in workshop interiors between 1582 and 1647. A metal pin with a spherical top inserted into the working bench is visible in a drawing of a printshop interior by Stradanus and may therefore have been used only in Italy where he was living at the time (Fig. 149).

Most other studio interiors show a wooden sphere on a foot standing on the working bench. Resting the plate on the sphere allows the engraver to turn it at any angle in every possible direction (Fig. 150; see also Fig. 11, p. 12).[356] Goltzius's portrait of Coornhert of 1592 shows just such a stand covered with what looks like a piece of leather (see Fig. 114), probably to provide grip and prevent the plate from slipping. Not all depictions of engravers' spheres are as well defined or of the same shape. Sometimes they seem more like the upper half of a sphere, the flat part laying on the working bench. A clear example is seen in the portrait of Pieter de Jode the Younger by Anthony van Dyck for his *Iconography* (1630–1640). On the table in the lower left a copper plate is leaning against a sphere cut in half, the cut flat part attached to the top of a square block.[357]

In a goldsmith's workshop, what looks like a leather cushion can be seen in a painting by Niklaus Manuel of 1515.[358] The cushion has the shape of a nine-pointed star. A silver plate is stuck to the flat centre of the cushion, perhaps with some pitch, and a young man is engraving the plate by holding one of the points of the star with his left hand and pushing the burin with his other hand.

It is not before Wolfang Kilian (1621) that an engraver of printing plates is illustrated with a clearly recognisable leather cushion underneath his plate (see Fig. 78, p. 92).[359] The image shows the plate supported on the cushion, the engraver guides the plate with one hand and pushes his burin with the other hand. John Bate (1634) is the first to mention that 'there ought to bee a little bagge of sand under your Plate, to the end that you might turne your plate upon it as your worke doth require'.[360] A round leather cushion (*coussinet*), 6 inches in diameter, 3–4 inches thick and filled with sand is described and illustrated by Bosse (1645).[361] Cröker (1736) mentions that usually leather cushions are round, but some are square. The smaller round ones are 5½ *Zoll* in diameter and 1¾ *Zoll* thick, the larger ones 8 *Zoll* in diameter and 2¼ *Zoll* thick.[362] The cushion is half a *voet* square, or square with rounded corners, and 3 or 4 *duim* thick, according to Chomel (1778).[363] Engravers would have had a small cushion for engraving smaller plates and a large one for bigger plates.[364]

The sphere and cushion were apparently used concurrently for a while because Lairesse (1707) stated that the plate does not lay flat on the table, but on a 'ball or sand pillow'.[365] The engraver's sphere eventually disappeared but the use of leather cushions has continued to the present day (see Figs 147 and 153; see also Fig. 79, p. 93). Other plate supports have also been devised. Alois Kosch-Görlitz (1932) stuck his copper plate to a kind of turntable that allowed him to move his plate to the left and the right but not up and down.[366] Very small plates are fixed to woodblocks for better handling;[367] they can also be turned on a coin or a larger piece of stiff paper.

Other tools

Early interiors of engravers' studios show the tools and materials already mentioned: plates, a support, various burins, a honing stone with a small cup with olive oil, and a burnisher. Later on, a scraper or a combination scraper-burnisher also appears. As mentioned above, when engraving a line in copper the metal removed from the plate forms curls in front of the burin. The raised copper is cut off with the sharp side of the shield of the burin or with a 'sharp iron' (*vifue areste*).[368] Some seventeenth-century images show scrapers that resemble flat knife blades.[369] The scraper with a three-sided steel blade seems to have been around by 1690 and by the mid-eighteenth century had become a standard tool.[370] When ready, the engraver checks that the plate's surface is smooth using his fingers, some oil is poured on the plate, and burrs are scraped off and burnished.[371]

A stand with the design to be copied is placed in front of the engraver or at the side of his working bench (Fig. 151; see also Fig. 149). Sometimes a small piece of cloth is visible (Fig. 147 [no. F], Fig. 148 [underneath the plate], Fig. 151 [between the plate and burins]; see also Fig. 27, p. 30 [lower right corner]). This is a piece of blackened felt that is rubbed over the freshly engraved plate in order to gauge the final effect of the engraving, the black being retained in the grooves.[372] A mirror, referred to earlier, is seen around 1800;[373] it is used to either check the image on the plate or to look at the design or original and establish how it should appear on the plate.[374]

The close work is very demanding on the engraver's eyes. The biographies of various engravers, including that of Lucas Vorstermans, the celebrated engraver of Rubens and Van Dyck, cite loss of eyesight.[375] In some depictions of earlier studio interiors, spectacles can be seen (Figs 148 and 151; see also Fig. 84, p. 97).[376] Magnifying glasses are

shown in some seventeenth-century studio interiors (Fig. 152) and are sometimes mentioned in manuals and inventories.[377] In the twentieth century, engravers started wearing an extra pair of magnifying glasses in front of their normal glasses (Fig. 153).[378]

Corrections and repairs

Some repairs are possible in engraving. When wrongly engraved lines are very thin, the sides of the grooves can be pushed inwards with the polishing tool. The surface closes up and with some further polishing the repair becomes almost invisible.[379] Thicker lines and hatchings can be erased by scraping off the metal locally until the erroneous grooves have been removed. The area is hollowed out in this way and the plate is hammered from behind to bring it level with the surface.[380] To prevent indentation in printing again some pieces of paper are pasted underneath on the back.[381] The exact location for hammering on the back was defined by means of a pair of callipers; with one point positioned on the place to be raised, the point opposite marks the place on the verso to be hammered. Alternatively, a thread can be tied crosswise around the plate and the cross hammered at the back to align with the cross on the front.[382] A special hammer was used for this with one side of the head ball-shaped and the other side flat.[383]

Electrolysis was used in the nineteenth and twentieth centuries to fill the wrongly engraved grooves, instead of scraping them away. The surface of the plate is covered with varnish or etching ground, leaving the grooves to be repaired open, or the complete area to be corrected is left uncovered. Next the plate is galvanised (copper is deposited on the plate by electrolysis), by which process the grooves are filled, and after cleaning and polishing the plate becomes smooth again.[384] Because the deposited copper does not have the compact structure of a hammered plate, the engraver has to ensure that the burin does not slip into the filled groove.

Specialisations

In eighteenth-century Paris the most famous engravers were too busy to engrave every plate personally so specialists were employed for the engraving of, for example, landscapes, figures or decoration.[385] The engraving of letters and maps had already developed into a specialisation in other cities.

Engraving letters and ciphers in metal objects was practised in the Middle Ages before the introduction of intaglio printmaking, engravers having adapted to working in reverse.[386] Instead of a burin, letter punches hammered texts into the plate. The use of letter punches for intaglio printing plates is found in maps as early as the fifteenth century, such as in those by Konrad Sweynheym for his 1477 Ptolemy edition.[387] Georg Hartmann used letter punches for the engraved paper sundials he marketed in Nürnberg in the second quarter of the sixteenth century (Fig. 154).

Printing plates began to exhibit more and more engraved text, sixteenth-century Italian prints in particular display some good quality letter engraving. The situation became more complicated when masters in calligraphy wanted to publish embellished specimens of their virtuoso writing. French calligraphers in the late sixteenth and early seventeenth century had difficulties finding French copper engravers to transfer their works into engraving and therefore hired specialist foreign engravers, such as Simon Frisius.[388] In the prologue to his *Arte de escrivir* (1650) Spanish master calligrapher Juan de Casanova explains that because he could not find an engraver skilful enough to engrave his models, he decided to learn engraving and to cut the specimens himself. His explanation of the technique is the first practical instruction of how to engrave letters in copper.[389] Engraving texts in printing plates was a job for specialists, but their names are rarely found in the plates' addresses.[390]

The engraving of geographical maps involved using techniques to express the various topographical elements, such as the relief of mountains and shading for particular terrains. All could be done with a burin, but different punches were also used, such as circles for designating towns, triangles and crosses, as well as ciphers and letters. The punch was lightly hammered into the plate and the raised metal scraped off and polished.[391]

Engraved musical scores first appeared in the early 1530s but only became more common in the 1580s.[392] The intaglio printed music of that period shows that first a five-pointed rake was used for scratching the staff into the copper plate and next the annotation was engraved with a normal burin. This method continued until the eighteenth century when the engraver could also make use of special punches for the various signs and letters, with slurs being cut with a burin (see Fig. 111).[393] Copper and tin plates were used in the eighteenth and nineteenth centuries, but the cheaper, softer tin (or pewter) was preferred as it could be worked faster than copper and because punches could be hammered deeper into the soft metal.[394] The engraving of music was superseded by lithography in the nineteenth century, but was still practised until the 1930s, if not the 1950s, before it finally disappeared.[395]

Engraving systems

Different engraving systems have been developed over the centuries but a more detailed discussion of these in this study would not be appropriate. Nevertheless some historical developments will be highlighted in order to illustrate the relationships between particular methods of engraving and the appearances of prints.

It has already been observed that the first engravers did little more than follow the outlines of the design and its details, with some hatching to suggest volume, which gradually became more realistic in the last decades of the fifteenth

century.[396] Early German and Italian engravings show hatching with straight parallel running lines that make figures look rather stiff. Marcantonio Raimondi allowed his hatching to curve systematically around the volumes of the limbs and trunks to create ideal bodies (Fig. 155).

North of the Alps, his contemporary Albrecht Dürer developed engraving towards rendering a more rational-looking world. His fur is fur, his cloth is cloth, as Erasmus observed; Dürer was capable of rendering colour just using black lines (Fig. 156).[397] His designs, due to his more homogeneous manner of engraving and the deep black printing ink used, exhibit strong contrasts.

Missing in Dürer's prints, however, is tonality, one of the major features in the engravings of Lucas van Leyden, as recognised from Vasari and Van Mander onwards.[398] Lucas's engravings achieve tonality due to differences in line widths, and variety in hatching with additional dotting and stippling (Fig. 157). Also, his plates are often printed with inks prepared with a grey, instead of deep black, pigment to emphasise the atmospherical perspective.

Andreas Vesalius published his standard work on human anatomy illustrated with woodcuts in 1543,[399] and Thomas Geminus copied the plates in engraving two years later.[400] Vesalius's illustrations still have an aesthetically appealing value, with the anatomical figures dramatically posed in imaginary landscapes, and with a careful layout of texts and illustrations. Geminus copied Vesalius's woodcuts in engraving in a more compact and professional way (see Fig. 123). The figures still pose dramatically but they are just a little smaller than the originals and inverted in one instance, and landscape details are deleted. Instead of Vesalius's folding plates and figures within the text, Geminus efficiently compiled various figures on one plate, printed the plates separately, and supplied illustrations and text on separate sheets. Vesalius's woodcuts imitate lines with tapering ends and cross-hatching drawn by pen and ink but Geminus's engraving manner does not imitate – the cross-hatching and tapering ends of his lines are just how they should look in engraving.[401]

When Ippolito Salviani's book on marine animals was published in 1554, care was taken that the fish, rays and sharks were as vividly and realistically depicted as possible.[402] His engraver Nicolaus Beatrizet used only lines to depict the animals, but managed to reproduce their volumes, as well as the colours and textures of their skins (Fig. 158). More important than Geminus's copies of woodcuts, Salviani's project shows a growing interest in depicting a rational world. The engraver met the needs of the project in a way familiar to him by engraving more or fewer lines to reproduce shadows and highlights, colours and volumes. But regardless of how modern the engraving may look, all the lines are thin and evenly engraved – there is no variation in width, no playing with the possibilities offered by the medium.

The *schwellende Taille*

Typically an engraved line starts with a point and from there widens until the desired width has been reached, continuing at the same width to the pointed or square end. When the handle of the burin is moved down again, the tip of the burin moves up and the engraved line ends in a point. When the engraver stops in the middle of his movement with the groove still of the same width, the line will end square.

Rather unexpectedly, given the earlier Italian feeling for tonal values, it was someone from the north, Cornelis Cort from Hoorn, who came up with new ideas for creating more realistic impressions by systematically exploiting the possibilities of the medium. Lines became longer and engraved in various thicknesses. Importantly, he started experimenting with variable width lines (*schwellende Taille*) shortly before he left for Italy in 1565.[403] It is therefore not surprising that he became eminent in the service of Titian, the painter recognising the value of the engraver's ability to reproduce his works in a more sophisticated technique than those used by any of Cort's Italian fellow engravers.

Cort's idea was to widen the groove locally, instead of keeping the same width along the path followed by the burin as was common until then. In detail, the differences are minor, but a well-aimed conglomerate of swelling grooves gives a voluminous effect (Fig. 159). Following on from Cort, tones and volumes could be created, surface textures rendered and colours suggested with an engraving system of parallel and crossing lines, keeping to the contours of the volume. Just the mere swelling of lines, with the cross-hatching interspersed with minute dots, was sufficient to create the metal shine of an iron helmet, the bulging muscles of a hero or the blushing cheeks of a nymph.

The engraver knows that holding the burin at a steeper or shallower angle creates wider or thinner lines respectively. It is disciplined training that ensures that all lines are of equal width and most apprentices strove to achieve it. That the technique was already practised before is evidenced by a portrait engraved in 1550 ('MDL') of Cosimo I de' Medici at the age of 28. The print shows subtle tonal effects created by allowing the parallel running diagonal lines that form the hatching for the face swell in engraving in order to render the structure of bones and muscles underneath the skin (Fig. 160). Engraving with swelling lines was also practised in Antwerp in that period, as shown in a series of *Compartments* published, and perhaps also engraved by Hieronymus Cock in 1553. The prints exhibit lines of various widths, while swelling of lines can be observed particularly in the engraved texts (Fig. 161).

Cort's invention was to clearly accentuate technical possibilities to create expressive features in the engraved image. His style found favour and was followed in Italy long into the seventeenth century, as well as in the northern Netherlands. Hendrick Goltzius developed the idea further in the last quarter of the seventeenth century, creating a

true system of engraving with swelling lines, almost mechanically engraving cross-hatching, dots and flicks,[404] and culminating in the virtuoso engraving of the Dutch Mannerists with such prominent figures as Jan Muller (see Fig. 1, p. 4), Jacques de Gheyn II, Jan Saenredam and Simon Frisius.

Frisius, who worked in Paris, was one of Bosse's major influences.[405] Bosse found an ally in Robert Nanteuil as both men sought the most accomplished manner of creating an image by means of parallel swelling and tapering lines. The idea that Bosse put forward, after a question by Nanteuil, was that the direction of the lines should follow the direction of the light catching the object instead of merely adding more or less (cross-) hatching, which meant close adherence to the rules of perspective to create spatial effects.[406] This worked well and changed the appearance of both Bosse's and Nanteuil's works.

Together with Claude Mellan and Pierre Aubert, he further developed a method of using parallel lines only, even without cross-hatching, relying on local swelling of lines only to create tones and volumes (see Fig. 128). This style culminated in France with Claude Mellan's masterpiece *La Sainte Face* (1649). Cut along a spiral, the single though undulating line renders a three-dimensional effect (Fig. 162).

Giannantonio Faldoni brought Mellan's engraving method to Venice, where it was further refined by Giovanni Marco Pitteri. He eliminated outlines and engraved areas of parallel lines made up of series of elongated triangular dashes. These together combined to achieve a subtle and suggestive rendering of light reflections and tonal effects.[407] The atmospheric effect he could create in this manner was eminently suitable for the reproduction of Carravagesque designs. The tonal scale of his engraving system could compete with that of a mezzotint, if not surpass it in brilliancy as a mezzotint tended to be murky. Most successful was Pitteri's *Series of Apostles* after drawings by Giovanni Battista Piazzetta.[408] Pitteri received a Venetian patent (*privilegio Excellentiss, Senatus*) for the series on 7 September 1742 and the prints became an immediate success (Fig. 163).

Decline of engraving

Learning copper engraving was the major component in the basic training of engravers and the technique was refined still further in the nineteenth century with the introduction and development of steel engraving. The characteristics of nineteenth-century engraving, 'in comparison with the work of other centuries', as Hamerton commented, 'are chiefly a more thorough and delicate rendering of local colour, light and shade, and texture'.[409]

Nevertheless, the rapid progress of lithography and wood engraving, the mechanisation of the printing trade, but above all the application of photography, largely diminished the value of engraving in copper and steel. Serious efforts were made to keep engraving alive in France, but it largely disappeared in England[410] – the Royal Academy in London held contests for engravers in the nineteenth century but by 1889 there were simply no candidates.[411]

By the 1920s the role of engraving had been reduced to cutting blocks for postage stamps and banknotes.[412] This is not to say that more traditional engraving or engraving per se had completely died out – there even was a modest revival of the process in England and Germany at the time, preceded by the work of Dutch engraver Pieter Dupont in the first decade of the twentieth century, and it remained in use for book plates (*ex libris*).[413] Joseph Hecht and Stanley Hayter, working in Paris, abandoned traditions and used engraving from a Surrealistic point of view, the flow of the burin being guided more by impulse than reason (see Fig. 10, p. 9).[414] Nowadays engraving copper or steel is still practised by a small number of printmakers (Fig. 164).[415]

Tone

Hatching more or less densely suggests tonal values, which developed into true engraving systems for the suggestion of volume, as described above. Dotting with punches was typical for fifteenth and early sixteenth century metalcuts (printed in relief), where it was used primarily for decoration, volume being secondary. Typical of engraving is the addition of dots and flicks to the hatched lines for planes and for smooth transitions from highlights to shadows, visible in prints from the early sixteenth century.

Dotted engravings were created by Giulio Campagnola and some immediate followers shortly after 1500 (see Fig. 34, p. 34).[416] Tilting the burin instead of moving it parallel to the surface of the plate made way for a new dimension in printmaking. Not that his technique was new – dotting can be observed as early as the twelfth century in engraved objects but it was only used for decorating the surface of a metal plate evenly at that time whereas Campagnola's idea was to produce a smoothness in the printed image that would reproduce tone, volume and through that a sophistication, a mood or atmosphere as compared to the rather harsh naturalistic engraving of Dürer.[417]

Dotting larger surfaces rather than just transitional areas became an intrinsic part of engraving, either on its own or for the rendering of skin, faces and hands. It was especially suitable for rendering ethereal images such as those of God, angels and souls in otherwise linearly engraved surroundings. Examples are found in works by Raphael Sadeler I (Fig. 165; see also Fig. 187).[418]

The technique is relatively simple: the burin is inserted into the plate at a steep angle and the burr raised cut off.

In one variation, the engraver picks out tiny bits of copper holding his burin in the normal position. Any burrs raised are scraped off and polished to achieve a crisp tone. Special burins with sabre-shaped blades were available for the task, which probably allowed for a more ergonomical grip (Fig. 166, nos. 8 and 12).[419]

The effect of such movements are triangular dots, finer and better defined than dots made by pen and ink (see Figs 150 and 176). The technical difference is that a well-honed burin tip is sharper than the inked tip of a quill pen thereby ensuring that in printing the ink kept within the engraved pit will not run in printing whereas a drop of writing ink would soak into the paper. Consequently a dotted engraving allows for nuances not possible with dotted pen and ink drawings; conversely washed ink drawings can be represented by means of dotting.

Instead of the tip of a graver, a punch can also be used, which produces round instead of triangular dots. Bernhard Zan produced a series of designs of decorated plates, cups, etc. for goldsmiths in 1581 (see Fig. 122). All the lines were made by punching fine dots in two stages: the dotted lines forming the outlines print a little darker, the dotted lines forming the tones print a little lighter.[420] Other goldsmiths followed Zan's example.[421] Typical of this technique are the five prints by Janus Lutma the Younger (1681) in what he called *opus mallei* (hammerwork), made by dots hammered into the plates using a punch.[422]

François-Philippe Charpentier and Per Gustaf Floding invented some sort of machine in order to mechanise the repetitive motion of dotting. They may each have invented a machine independently but they joined forces at some point to publish a series of prints with dotted tones in 1762. In addition, the plates were worked with various punches and direct etching.[423] The tool (*outil*) of Pierre-André Barabé (1763) produced a multitude of small triangular dots in the plate allowing light tones as well as deep shadows to be made *dans le goût du lavis*. Initially his invention was intended for architectural prints for which mezzotint is unsuited as it cannot create sharp details.[424]

Another mechanical means of producing tones is by hatching with a drypoint, which is found from the earliest engravings onwards (see Fig. 30, p. 32).[425] Alternatively, scratching the plate with hard materials such as polishing stones, slate pencils and special stone sticks is found regularly over the centuries.[426] Drypoint has the potential to create tones, as has been described previously for works by the Master of the Playing Cards, Hercules Segers and Rembrandt, were it not for the burr that wears rapidly. There was a brief flirtation with tonal drypoint techniques before a technically more effective variety of drypoint arrived in the form of 'mezzotint'.

Mezzotint

The mezzotint process first developed as another printmaking technique, fitting comfortably in the engraver's usual business of making portraits and genre pieces etc., for which the method lends itself well. However, its potential for the reproduction of paintings was soon realised. In the eighteenth century in particular, in combination with colour printing, facsimiles of oil paintings were made that astonished their audiences.[427] Mezzotint's application to the reproduction of paintings revived in England in the 1830s then gradually faded again to almost disappear in the second half of the twentieth century,[428] when it experienced a revival for the purpose of creating original works of art.[429] The early history of the mezzotint technique is exceptional when compared with other engraving processes – because it has been documented and studied relatively well, it became fashionable quickly and has enjoyed long-lasting popularity. It is therefore treated more extensively here.

A new invention

The first new graphic process of which the name of its inventor and the year of invention are known, and which was to become a standard method in printmaking, is 'mezzotint'. The German military officer and amateur artist Ludwig von Siegen, then residing in Amsterdam, reported on a new printmaking technique invented by him in a letter dated 19/29 August 1642 to his superior Wilhelm VI *Landgraf* of Hessen-Kassel.[430] With the letter he sent a portrait of Wilhelm's mother Amelia Elisabetha *Landgräfin* of Hessen-Kassel engraved by Von Siegen using his new technique and dated in the plate '1642' (Fig. 167).[431]

Von Siegen does not provide any technical details in his letter, but the print itself demonstrates how, using his method, he built up tones in gradations from light greys to blacks by means of some kind of drypoint technique. In other words, he invented the first printmaking process by which continuous, tonal gradations from the white of the paper to deep black are created, instead of using different steps such as hatching or dotting.

During his lifetime Joachim von Sandrart (1675) was the first to attribute the mezzotint process to Von Siegen, although placing its invention in the year 1648.[432] Apparently various stories circulated then. Three years later, Samuel van Hoogstraeten expressed some doubt, referring to Prince Ruprecht von der Pfalz, 'or somebody else before him' as the inventor of the process.[433] Gilles Filleau des Billettes (1693) also thought it was someone other than the prince.[434] John Evelyn (1697), to whom the mezzotint technique was demonstrated by Prince Ruprecht in 1661, was not aware of Von Siegen until later in his life. Moving into the field of print history again, he mentioned the 'late *Melanochalcographer N. de Seigen*; who in the year 1648, first produced the *Mezzo-Tinto* Graving'.[435] Later authors generally credit Prince Ruprecht as the inventor. Von Heinecken (1771) recognised Von Siegen, but that did not improve matters greatly.[436] Finally, in 1839, Leon de Laborde published a facsimile of Von Siegen's 1642 letter to Wilhelm VI, which settled the dispute

and established Von Siegen as the inventor of the mezzotint technique beyond any doubt.[437]

With regard to the terminology of the word 'mezzotint', Evelyn in his diaries for 1661 referred to 'Mezzo Tinto'.[438] Alexander Browne, who published the first technical description of the process in 1669, called it 'Mezo Tinto,'[439] a term that has remained in use in most languages since. The French, however, tended to refer to *la manière anglaise* because it was mostly practised in England, rarely in France. They also called it the *manière noire* ('black manner') by which name the process is also known in other languages.[440]

Technique

Although Von Siegen reported the invention to his superior, he never published anything, nor is a manuscript of his known giving practical details of the process. The prints themselves reveal that his method was 'additive'. He first etched a dotted outline and next built up tones from light greys to blacks with series of dots created mechanically with a kind of tool. He did not make the dots by 'ticking' with the point of a burin or a punch, but he used an instrument with one row of teeth that moved back and forth over the plate leaving series of regularly spaced dots. The points of the tool were driven into the metal that consequently was pushed up around the tiny holes.

The tool raised burrs just as in drypoint and did not remove the material as a burin does in cutting; where needed the burr was reduced again by polishing. So much ink was left behind the burrs in wiping a mezzotint plate that in the print a continuous tone is observed; the dots are not sharply defined as in engraving or etching. This makes it the first true 'half-tone process'. In other words, it is the first printmaking process by which continuous tonal gradations could be created from the white of the paper to the deepest black or any colour.

By running his tool less or more frequently over the same part of the design, Von Siegen produced various hues of grey to black: the black was a solid saturated black and not a series of individual lines or dots, while the greys were actual greys; highlights were made by polishing down burrs.

Close observation of his prints provides clues as to what Von Siegen's tool may have looked like. The instrument left traces of evenly spaced single dots, ordered in zigzags, with the lines of dots at sharp angles to each other. These traces give the impression that he used a toothed roll, moving it forwards and backwards.[441] But a similar, if not same effect can be achieved by rocking a chisel with the lower end of its blade curved and the bevelled edge of the blade engraved with radial grooves; such an instrument can be seen in a manuscript by John Evelyn.[442]

Evelyn's notes are illustrated with some sketches.[443] The first is of a 'Hatcher', the chisel-shaped tool used for rocking the plate's surface (Fig. 168). The second is of the 'style', a scraping tool, 'likewise made either like a narrow chizell, or like a pen-knife'; the blade 'ought to be very sharp'. The engraver might have two such tools. The other end of the style can be tongue-shaped to form a polishing tool or 'Burnisher'. Depicted is a (steel) rod with, on the right side, the blade of the scraper called a 'chizell', its cutting edge slightly out of line with the handle. The other end, called a 'burnisher', resembles a common tongue-shaped polishing tool.[444] Burnishers could also be acquired separately and the 'style' set in a handle for comfort of use.

The third sketch in Evelyn's manuscript illustrates how to 'wriggle' the hatcher vertically, horizontally and, if needed, once or twice diagonally over the plate.[445] Next the design is traced on the plate, and the tones scraped and polished. Browne (1669) described something similar but without giving any details of his rocking tool, just calling it the 'Engin'.[446] The anonymous author of *The Excellency of the Pen and Pencil* (1688) gave instructions that the tool should move over the plate in the four directions, repeating each twenty times. The illustration shows the instruments for mezzotint: a roulette (The Engine) and four scrapers made of flat pieces of metal. The depicted 'Burnisher' is not mentioned in the text (Fig. 169).[447] This scheme for rocking the plate in four directions can be found in manuals throughout the eighteenth and nineteenth centuries and is visible in mezzotints of that period (Fig. 170).[448] Not until the second half of the twentieth century did it become customary to rock the plate in additional different directions.[449]

Prince Ruprecht, perhaps in discussion with others, invented several methods to roughen the plate's surface. For example, his *Large Executioner* (1658) does not show Von Siegen's dotted texture.[450] Instead the plate is covered with semicircular lines, the centres of which seem to have been close to the upper left, middle left and lower left as judged from the print. It has been argued that Ruprecht used a needle set in one arm of a pair of compasses, a device that became more popularly known as the 'pole and pivot'.[451] The expression alliterates well, but does not sound convincing. One has to both turn the (large) pair of compasses and with some force scrape the needle through the metal in one movement, which is not easy.

Given the regular curvilinear texture that can be seen, a simpler method seems more plausible. A nail is hammered into one side of a wooden tabletop, a rope is bound to the nail and secured to ensure it cannot move. The other end of the rope is tied to a drypoint. A copper plate is placed on the other side of the tabletop, the rope stretched and the drypoint moved over the plate in a semicircular movement. By turning the rope around the nail the rope gradually and regularly winds itself up around the nail, while at the same time the engraver can scratch lines with the needle into the plate at regular distances. After preparing the plate's surface in this manner, Prince Ruprecht scraped or polished down the burrs. Apparently this was a one-off experiment. In the *Standard Bearer* and in the *Old Man's Head in Right Profile* of the same year, the textures appear to have been made with a rocker.[452]

The latter method did not really progress any further once the techniques of rocking the complete plate's surface and scraping down the burr had been established. The method and tools were refined, however, and the tonal scale and the detailing extended due to the improving skills of the mezzotinters.

Rockers and rollers

Evelyn's manuscript shows a chisel-shaped tool, but new developments were in the pipeline. On the right of his sketch of the Hatcher he had already noted that 'They hatch now with a steele Cylinder or Roller', in other words a roulette. Browne does not describe the tool – he merely mentions the 'Engin' without explaining what it looks like, stating 'As for the manner or shape of the Engin, they are divers.'[453]

The mezzotints by Allart van Everdingen and William Sherwin have a peculiar texture. These engravers are popularly said to have prepared their plates with a rat-tail file weighted with a piece of lead, but there is no contemporaneous source to confirm this.[454] The use of lead sounds impressive, but lacks any practical validity, because the effect of the extra weight is negligible.[455]

More plausible than a rat-tail file is the technique of rolling a small toothed wheel over the plate using the force of a man's weight. The pressure exerted on the few square millimetres where the wheel's surface touches the plate is enough to drive its teeth into the copper. Edward Luttrell's treatise of 1683 describes a roulette with a flat cross-hatched surface. The 'roule', as he calls it, is placed in a large handle held against the shoulder when pushing it to the plate.[456]

A smaller 'Engine' is shown in the *The Excellency of the Pen and Pencil* (1688): a wheel held between the two teeth of the fork-shaped extreme of a bar set in a handle. The wheel has a flat tread, which means it does not have one row of teeth but a particular texture such as a cross-hatching engraved in it that creates a multiple pointed surface, similar to Luttrell's description. The accompanying text advises the reader to 'get a Roll made of the best steel, about one Inch Diameter, and one Third thick and hatcht round the edge and crost again at right Angles' (see Fig. 169).[457]

A slightly larger toothed wheel set in a handle is depicted by Andreas Glorez (1699) and he also shows an engraver working the chisel-shaped tool with radial grooves (Fig. 171).[458] Comparable to Evelyn's sketch the grooves seem to be cut on the bevelled edge, or facet, of the blade instead of on the flat side.

The use of a toothed wheel for mezzotint probably disappeared around 1700, although the use of small-size roulettes to build up tonal areas experienced a revival in France in the last quarter of the eighteenth century.[459] The difference can be seen in Cröker's manual (1736) in which he depicts and describes all the instruments for mezzotint but does not include a roulette. His illustration of a rocker blade shows that the grooves were no longer cut radially but parallel, and they are cut on the facet of the blade in common with sketches of rockers in other eighteenth-century sources (Fig. 172; compare with Fig. 174, A–B).[460] The teeth are sharpened by honing the blade from the other, flat, side down.

By the middle of the eighteenth century the rocking tool was nearing its final defined shape.[461] The last step entailed cutting the grooves on the flat side of the blade, leaving a smooth facet on the other side. This is first observed in Fielding's manual of 1841 (see Fig. 166, no. 10) and is comparable to a modern mezzotint rocker blade (Fig. 173).[462] The advantage of parallel grooves is that the distances between the teeth remain constant when the blade loses material due to sharpening. With radial grooves, the distances between the teeth (number of teeth per inch) grow narrower when a significant amount of material is lost resulting in a loss of control, the plate texture becoming finer and finer. Modern mezzotint blades have differing numbers of (parallel) grooves, and thus teeth, per inch or per centimetre.[463]

To sharpen the teeth of the rocker easily and retain the sharpness a little longer, a double facet is cut on the smooth side of the blade. Another drawback of cutting the grooves on the bevelled edge of the blade is that after a while so much material is removed in sharpening that the facet on the verso widens and takes more time to sharpen because more material has to be removed. To overcome this, modern rocker blades have two facets, one over the other. The first facet is cut at a rather sharp angle removing most of the material. The angle of the second facet is less acute and can easily be maintained by honing by hand on a stone. The larger facet is cut on a machine.[464]

Scrapers and burnishers

The other tools needed for preparing a mezzotint plate are a scraper and a burnisher. A special scraping tool must have been invented for removing burrs. When Bosse (1645) explains the technique of engraving, he advises that the raised curl should be cut off with a 'sharp iron', apparently a flat blade, or with the side of the burin's shield.[465]

Evelyn's sketches include a chisel-shaped tool, the chisel end cut obliquely to be used as a scraper. Browne (1669) mentions an 'Engin' and a 'burnisher', but not a scraper and neither does Hoogstraeten (1678).[466] *The Excellency of the Pen and Pencil* (1688) shows four different flat scraper blades (see Fig. 169).[467] Similar tools are also depicted by Glorez (1699) (see Fig. 171) and Cröker (1736).[468] A three-sided blade combined in one tool with a tongue-shaped blade for burnishing is described and illustrated by Filleau des Billettes (1693–1698) in connection with engraving (see Fig. 79, T, p. 93).[469] The same tool, in relation to mezzotint, is shown by Guélard (1743), Cochin (1745) and Le Blon (1756), so it was

presumably common by then (Fig. 174, H; see also Fig. 147, G).[470] The flat-blade scraper (*racloir*) continued in use, though, as it still had a function separate from the modern scrapers (Fig. 174, G).[471] A scraper with a four-sided blade (*rattoir* or *ébarboir*) can be found in 1767.[472]

Burnishers can be seen in various depictions of engravers at work in the first half of the seventeenth century.[473] Evelyn sketched in his manuscript a tool with one end tongue-shaped for polishing and the other end chisel-shaped for scraping (see Fig. 168) and 100 years later Halle depicted the same tool (see Fig. 241, no. 7, p. 297).[474] This tool looks somewhat outdated because the combination tools common in the eighteenth century have a tongue-shaped burnisher on one end and a three-sided scraper on the other, as do modern burnishers.[475]

Rocking alternatives

Rocking the surface of the plate is a challenge to one's endurance. Von Siegen's idea of building up tones by more or less charging the plate locally is efficient and his scraping is limited to the highlights. The process was reversed with later mezzotints, first covering all of the plate's surface with burrs and next scraping and polishing them down. Were it not for the beauty of the final effect this rather inefficient method would not have stood a chance. Developing methods for roughening the plate hovered therefore between equipment for faster preparation of its surface and tools for creating the deep velvet tones desired.

The mezzotint blade is rocked in a regular movement thereby going forward over the plate slowly. The teeth of the blade must be absolutely sharp and a fair amount of downwards pressure needs to be exerted in order to push the teeth deep enough into the metal. Plate 2 in Le Blon's treatise (1756) shows a handle with an extra knob at the side, enabling the engraver to work the tool with both hands (Fig. 174, C and D; see also Fig. 181).[476] By the end of the nineteenth century, the blade was set at the end of a large pole. The other end of the pole rested in a long trough that guided the pole in moving the rocker. This allowed the engraver to lean on the rocker end of the pole.[477] Similar tools are still used today.[478]

Although rocking tools as described above will give the desired deep velvety tones, the search continued to find a means of speeding up the process. Christopher Wren, in the early 1670s, roughened the plate with certain 'powders', a technique also known to Filleau des Billettes in 1693.[479] A century and a half later Karl Urban Keller had a similar idea. He sprinkled sand on the plate and ground its surface by running a hard roller over the plate or using a specially devised tool, a sort of oval ring with a vertical handle on top that he called a *Drucker* (pusher).[480]

The method of using some kind of grit, known as 'carborundum print', 'carborundum mezzotint' or 'carborundum intaglio', was reinvented in the United States in 1937/1938, this time grinding with carborundum powder (silicon carbide) instead of sand. When the main outlines had been etched and the tones ground into the plate, this was called 'carborundum etching'.[481]

Plate metal

Almost without exception copper is used for mezzotint. The metal is soft enough to allow the teeth of the rocker to penetrate deeply enough to raise sufficient burr for saturated blacks. Scraping and polishing is fairly easy.[482] On the other hand the metal is sufficiently tough to produce a 100 good and 200 fair impressions.[483]

Steel allowed for print runs at least 8–10 times longer, but the steel plate had to be rocked more frequently. As Thomas Lupton writes: 'The same tools are used [for mezzotint on steel], and the same mode of executing adopted as upon copper plates, the only difference I know of is, that greater strength must be used in laying the Mezzotinto ground; indeed it requires a very strong hand, and a greater number of ways. I have laid as many as ninety ways on some plates, whereas, on copper, the usual number is from twenty-four, to thirty-six, or forty'.[484]

Charles Turner agreed: 'when deep black is required, twice the number of ways will be found desirable: from sixty to a hundred will not be too many'.[485] In 1812, advised by James Watt, Turner had tried to make a mezzotint on a steel plate, but without success as the metal was too hard. Attempts on brass failed, too, because of the heterogenity of this alloy. The engraver William Say triumphed in January 1820 using a steel plate prepared by Jacob Perkins. English mezzotinters started working on steel from 1822 producing large numbers of plates. Steel, 'from its superior density' allowed for a greater tonal scale (more hues of grey) and cleaner whites. The effect of rocking the harder steel is highly visible in mezzotints printed from steel plates, however, because the tones tend to be cloudy and lack the velvety black appearance of mezzotints from copper plates.

Rocking machines

Rocking a mezzotint plate, as has been mentioned previously, is a tedious and time-consuming job. Bartsch estimated that rocking a plate of 45 × 60 cm took three weeks.[486] Nevertheless, this did not prevent engravers from making mezzotint prints of over two metres tall.[487] At some periods craftsmen who specialised in rocking plates for artists could be employed to carry out the work, but by the late nineteenth century Félicien Rops found it difficult to have a mezzotint plate rocked.[488] Dossie (1758) thought it would be a good idea if a machine could be invented for rocking the plate and, indeed, just such a kind of apparatus was in use in Augsburg in the late eighteenth century.[489] Rocking machines

would have been known all through the nineteenth century, although mentioned only rarely and perhaps little used in England given Lupton's reference to rocking steel plates. Reference to a machine specifically designed for rocking steel plates comes from France in 1833, where it was invented by Saulnier the Elder. The details remain a secret, but the results were judged positively.[490]

Various constructions for rocking mezzotint plates have been tried since then, especially in Japan in recent decades, where the mezzotint technique is relatively popular.[491] Usually the machine consists of a large blade that is rocked over the plate horizontally and vertically. Rocking diagonally is somewhat problematic with such machines because the blade will run off the plate (Fig. 175).

Dissemination of information

Von Siegen was not alone in his quest to find new tonal printmaking techniques in the middle of the seventeenth century. Similar in technique to Von Siegen were the prints by Dutch engraver Jan van de Velde IV. Working in Sweden in the first half of the 1650s he made a series of illustrations for a book about garden design by André Mollet, *Jardin de plaisir* (1651).[492] He engraved at least 20 of the 28 plates, part of which contain tonal textures created by dots made by a roulette with one row of teeth. Van de Velde also made an etched portrait of Queen Christina of Sweden before her abdication on 6 June 1654 using dust-grain aquatint to create various areas of greys (see Fig. 290, p. 359).[493] The tones were scraped down and polished to create highlights (replicating Von Siegen), while a roulette was used to enhance the darker shadows. Van de Velde employed the same technique in three other portraits made in later years.[494]

Van de Velde never communicated his method to anyone and therefore no one developed his ideas further. Von Siegen, however, was not so secretive although some time elapsed between his first mezzotint plate produced in 1642 and the communication of his process at the end of 1653 when he arrived in Mainz. He shared knowledge of his process with others, who in their turn passed on the information and so on. During the period 1656–1658, the method was taught to eight different artists/craftsmen,[495] all of whom were in the Mainz-Frankfurt area in this period because of the election and subsequent crowning ceremony of Leopold I as the German emperor in Frankfurt in 1658.

Von Siegen's first contact was with Dietrich Caspar von Fürstenberg, a gifted amateur artist. Von Fürstenberg made his mezzotints in the additive manner of Von Siegen and his first prints are dated 1656.[496] Through him at least two others started practising the process.[497] Prince Ruprecht arrived in Mainz in October 1655, met Von Siegen and his first attempts at mezzotint date from 1657.[498] The professionally trained artist Wallerant Vaillant arrived a little later and assisted the prince from 1656 to 1658.[499] They inverted Von Siegen's process by first completely roughening the plate's surface and then scraping out tones and highlights.[500]

After the crowning of Leopold I the two men went their separate ways. Vaillant first went to Paris in 1659, returned to Amsterdam by 1665 and founded the successful Dutch school of mezzotinters.[501] Prince Ruprecht travelled through Europe before settling in England in 1660. He demonstrated the mezzotint technique to John Evelyn and to Robert Murray in London on at least three different occasions in 1661.[502] Evelyn wrote about Prince Ruprecht in his 1662 treatise on prints, but without giving any details of his mezzotint process.[503] He did, however, publish a specimen of the new invention in his book (see Fig. 14, p. 16). This is the first, one of only a few, instance of a mezzotint book illustration.[504]

The specimen is a copy of the head on the mezzotint plate of the *Large Executioner*, produced by the prince himself. The burr of the smaller plate was not scratched with the curvilinear hatching of its example, but shows the dotted textures of a roulette or the chisel-like rocking tool sketched by Evelyn in his manuscript. The 'lines' here are made up of short (c.1.2 cm) rows of little dots. The grey and white spaces were created by scraping and polishing, and lines in drypoint were used for details, such as in the cloth around the head and in the ear. The background was roughened until the desired grey value was reached, instead of black, and then polished back.[505]

Evelyn, who became aquainted with Samuel Pepys in May 1665, showed Pepys how to make a mezzotint on 5 November 1665.[506] Alexander Browne, who taught drawing to Pepys's wife, may therefore have learned about the process through this channel and his *Ars Pictoria* (1669) gives the first published instructions for the method.[507] It is unclear whether Browne had actually seen the process carried out as he is not particularly detailed about the rocking of the plate and the rocking tool.

This remained the biggest problem for the early English mezzotinters who continued to experiment with ways to roughen the plate's surface until Dutch mezzotinters working in London in the 1670s demonstrated the proper rocking techniques.[508] The mezzotint process reached maturity at the hands of Vaillant in Amsterdam and professional Dutch engravers were quick to realise its potential; they travelled to England and Germany and using their newly acquired skills made their fortunes, in their turn training local artists.[509]

Crayon

Two kinds of lines can be created with drawing materials: continuous, with liquid media such as ink or watercolour,

and discontinuous or granular with dry media such as crayon or charcoal. Continuous lines are produced in engraving with a burin or by drawing a needle through an etching ground. Dotting is achieved using a drypoint or a burin but more mechanical means were sought. Reproducing the granular effect of crayon lines by engraving or etching was a *desideratum* that developed and flourished in the latter part of the eighteenth century.[510]

Roulette engraving

True reproduction of crayon lines began in Holland and France simultaneously. Cornelis Ploos van Amstel invented a crayon etching technique with the additional use of roulettes in 1756.[511] French engraver Jean-Charles François began developing a mechanical technique for the reproduction of crayon drawings in 1756 and was rewarded with a pension for the invention in 1757. From his training as goldsmith François's apprentice, Gilles Demarteau the Elder had acquired some punches, which he used for adding tones to his engravings.[512] François picked up on this idea and commissioned the instrument maker Alexis Magny to produce more punches like this and developed their handling towards 'crayon engraving'. Demarteau in his turn learned crayon engraving from François.[513]

François and his followers used roulettes, small steel wheels with an irregular toothed thread turning around an axle at the end of a handle.[514] Roulettes were used directly onto the copper and the burrs were polished down to print a crisp image comprising rows of dots, according to the original drawing. The burin, stabbed vertically into the copper, was used to add missing parts of the lines. Such dots are triangular and can thereby be distinguished from the more irregular traces of the roulettes (Fig. 176).

More instruments – as many as 40 – such as multi-pointed punches and moulettes entered engravers' toolboxes around 1800.[515] The instrument maker Magny continued on his own and invented a kind of machine to mechanise the dotting of crayon lines in 1757. He went to some trouble to exploit his idea and others also worked with the machine in the 1760s.[516] The apparatus would have been related to the machines designed by Barabé, Charpentier and Floding in the same period.[517]

Demarteau left his master to become a specialist in the genre. He developed the printing of a plate in red or black (see Fig. 276, p. 344), or *au repérage* in both colours from two plates, thereby imitating drawings in red and black crayons to perfection. Louis-Marin Bonnet, François's first apprentice before Demarteau, developed the process further to reproduce drawings in black and white crayon on blue paper and succeeded in making polychrome reproductions of pastel drawings. Famous is his *Tête de Flore* (1769) printed in 11 colours from eight plates, with two plates printed *à la poupée* (see Fig. 292, p. 362). He published a simpler version from three plates in 1773.[518]

The roulettes used by these men still had a rather coarse tread, the dots comprising the red or black crayon lines showing the surface texture or grain of the paper. With François Janinet, one of Bonnet's apprentices, a new school of engravers of reproductive prints emerged in France.[519] The planes in their prints have a very fine texture barely visible without a magnifying glass. From a distance the planes look as though they were made with dust-grain aquatint, but instead roulettes with very fine teeth were used to create tints. German contemporaries occasionally referred to it as the 'French manner (*Französische Manier*).[520]

Information about and regular application of crayon engraving hardly disseminated outside France and Switzerland. Abroad it was used only occasionally, such as by the Dutch engraver Hendrik Schwegman or the German Christian Friedrich Boetius.[521] Johann Meynier gave detailed instructions with specimens but not until 1804.[522] Hendrik Schwegman learned the use of roulettes in Paris and back in the Netherlands applied them in a rather coarse manner to add tones to his etchings. Technically, there was the difficulty of acquiring good quality tools, which were only available in Paris and Geneva.[523] A further problem was that the treads of roulettes wore rather quickly and it was impossible to sharpen them again.[524] Joannis Jacobus Bylaert (1772) considered the French way of working with roulettes too mechanical and proposed his method of crayon engraving by simply dotting the crayon line with a single-pointed needle.[525]

Crayon engraving is therefore a good example of how the skills of French instrument makers, engravers and plate printers combined to produce colour facsimiles that astonished their contemporaries. At the time they were only matched by the facsimiles of drawings published by Cornelis Ploos van Amstel.[526]

Consequently, because of their reproductive qualities, it was questioned as to whether such works could still be called 'art' because so much depended on technique.[527] Hodson commented in 1805 that the French prints indeed 'more nearly resemble original drawings in chalks, than the engravings of the English finished solely with the graver', but that the English prints 'possess a certain neatness, accuracy, and mellowness of style, which are sought for in vain in the chalk-engravings of our rival neighbours'.[528]

Reproducing chalk drawings was a vogue that died out again, but the equipment itself remained in use. The nineteenth-century engraver used roulettes to strengthen hues in etched or engraved plates and Joseph Amand Durand imitated plate tone in photomechanically reproduced Rembrandt etchings by means of roulettes.[529]

Modern developments

Experimentation takes place constantly and has been a continuous process throughout printmaking history. Many variations of known techniques have come and gone, some being related to one person only who used it with convincing results. However, for a new technique to be successful it needs to be simple and effective with tools and materials that are relatively cheap and easy to obtain and, importantly, the process has to be communicated. Of the classical mechanical procedures – drypoint, engraving, mezzotint and crayon engraving – it was drypoint that gained a large interested audience in modern times because of its expressive character. Engraving with a burin has virtually disappeared although it continues in other forms. Making mezzotints has recently experienced a revival but crayon engraving per se is gone, although for modern printmakers roulettes can create interesting textures that make their prints more vivid.[530]

Engraving

For the artist-etcher, new techniques have appeared or have been suggested since the late nineteenth century that aim to create particular textures with an artistic appeal or are intended to provide safer working conditions. A typical nineteenth-century invention is engraving by means of an electric current. James Pring discussed the electric engraving of steel and other plates using a metal pen connected to a battery.[531] When the gold- or platinum-tipped pen touched the plate it sparked and metal was removed. The groove was not deep and printed shallow, but it was visible. By connecting the pen to the other (+) pole of the battery metal was deposited onto the plate, which is comparable to electric welding. Pring explained that the technique was suitable for making intaglio plates and for the decoration of metal objects. Actual welding to create printing plates has been used since the 1960s.[532]

Power tools with rotary bits offer a range of possibilities from the finest lines to planes with capricious textures. Electric drills, as used in construction work, have been employed since the 1940s and currently small handheld drilling tools with all kinds of sanding, milling and polishing bits are popular for working printing plates.[533] Computerised engraving is used to create an image by drilling cells in metal plates, a technique applied for rotogravure, or by milling away larger areas.[534]

A somewhat unlikely process, although capable of creating refined textures, is engraving with dynamite. That textures could be embossed in stone or metal by means of explosives was already known.[535] Swedish engraver Verner Molin invented a refined version to create plates suitable for intaglio printmaking in the mid-1960s.[536] The metal plate is covered with various materials such as leaves and other flat objects or painted with a mixture of oil and granular matter. The dynamite is placed on top of the plate, charged and the material is pressed into the metal. After cleaning and flattening the plate is printed in intaglio.

Finally, a design can be engraved into a wooden, metal or acrylic plate by means of a computer-guided laser.[537] The digital image is burned into the plate as a series of fine dots, and the plate can be printed manually.

Mezzotint

By the mid-twentieth century mezzotint was at a low ebb, although the process is mentioned in manuals of the time.[538] In Japan, Yozo Hamaguchi began making mezzotints around 1955, which developed into the trend of the Japanese mezzotint. In England Julian Trevelyan (1963) expressed his debt to Ronald Fuller 'for his efforts to revive the almost lost art of mezzotint'.[539] After that, events moved on and the technique experienced a revival that began in the 1960s and continues today (Fig. 177).[540]

Consequently new rocking techniques were developed. Hugh Paton (1920), writing about mezzotint, discussed 'glass paper mezzotint', a technique that involves roughening the surface of the plate with emery paper. He claims to have invented the technique in about 1890–1895, but also concedes that it is probably a rediscovery.[541] Sandpaper is applied to roughen the plate, either by 'sanding' the plate or by placing it on the surface and pressing the grain into the metal to raise burrs.[542] In the current version, the plate is placed on the bed of the press with a piece of coarse emery paper on top and run through the press a number of times. Jozef Kubas (1959) showed a construction with five or six circular saw blades screwed together that was then rolled over the plate by hand.[543] A more modern technique is to draw lines close to each other on the surface in a number of directions with a sharp knife. Sandblasting is another option, and various aquatint techniques are being employed to create a base texture.[544]

A lithographic plate graining machine can also be used to prepare a mezzotint plate. The plate is fastened to the bottom of a tray, large marbles or steel balls, carborundum powder and water added, and then a power-driven oscillating machine shakes the tray for several hours. By choosing carborundum of a certain grain size a particular coarseness can be produced. The graining is more homogeneous than rocked plates, which makes such surfaces well suited for finely detailed work.

Collagraph

Instead of removing material from the plate, material can be built up on top of the plate's surface. Hubert von Herkomer invented what he called 'spongotype'.[545] Basically he made a monotype, had the plate steelfaced and printed it in intaglio. The impression shows all the characteristics of the brushwork because the ink is retained in the re-

cessed parts of the strokes. He presented his invention at the 1895/1896 exhibition at the Fine Arts Society.[546] Hugh Paton came up with a similar idea in the same year. In his process a paste is brushed onto a plate somewhat like in monotype, covered with graphite and galvanised.[547]

Galvanising is no longer commonly practised in printmaking but soldering and gluing materials together to make a printing plate has attracted growing attention. Rolf Nesch soldered strips of metal, gauze etc. to metal plates, printing them in intaglio and relief from 1932 to 1958.[548] His idea was adopted by Glen Alps, professor of printmaking at the University of Washington, Seattle, under the term 'collotype' in the USA in the mid-1950s.[549] Later the terms 'collagraph' and 'collagraphy' were introduced.[550] The technique is also practised in Cuba and said to date back to the early twentieth century.[551] Brunsdon (1965) and Janssen (1966) describe techniques whereby cut-out strips of metal are pasted and soldered on a base and further treated, not unlike Nesch's technique.[552] Collagraphy was taught in printmaking departments at American universities, especially Iowa and Wisconsin, and at the Brooklyn Museum art school. Later Ross and Romano brought it to the UK, Romania and the former Yugoslavia.[553]

Since the mid-1990s collagraphy has also proved of interest to printmakers from a health perspective because no acids are needed to create the printing plates. Any kind of material can be glued to a metal, plastic or cardboard plate. After varnishing, the whole is inked in intaglio or relief, or both, and printed in one run. Metal, plastic, wood, glass, textile, sanding paper – all are used, their textures appearing similar to *frottage*. Materials can be pressed into resins painted on top.[554] Carborundum, textile and other grainy materials pasted to the plate create rough surfaces that hold larger areas of ink.[555] The consistencies of modern acrylic paints allow them to be shaped in virtually every possible texture and after drying they are hard enough to withstand printing a modest edition, which makes them suitable for collagraphs.[556]

For creating deep mezzotint-like tones, carborundum powder is glued to a plate, a technique developed by Frenchman Henry Goetz in the 1960s. The layer can be modified and worked to create a variety of textures. The process is called *gravure au carborundum* in France and 'carborundum collagraph' in the US.[557] Recently carborundum powder has been mixed with acrylic paint or glue and painted on the plate (Fig. 178).[558] Such plates are printed in intaglio and show the image embossed in the paper.

The collagraph technique is related to the collage and mixed media techniques of Pop Art in the 1950s and 60s, because it allows making *objets trouvés* part of the printing plate.[559] Its intricate textures appealed to printmakers and the possibilities of collagraphy were further explored in the next decades and can be followed closely in the printmaking manuals published up to the present day.[560]

Chemical Procedures

If engraving seems straightforward, etching is complex, and compared to the few prescriptions on engraving there is an abundance of information on etching materials and techniques.[561] On the one hand, engraving simply requires a burin plus some other tools, materials and a working desk, while the chemistry of etching requires more equipment and working space. On the other hand, to master the techniques of engraving takes several years of study under a master's tuition, whereas the basics of etching can be taught in the space of a morning and, if necessary, self-taught. The difference between the two is that mechanical procedures are direct, working straight into the plate, and almost all chemical procedures work indirectly because it takes a resist and a corrosive to etch the plate. The basic instructions for etching are simple, but complications set in with the many recipes for grounds, acids, stop-outs and solvents, the different needles, brushes and other tools, the acid containers and the safety precautions needed. There are many different etching processes and as in the above section on mechanical procedures, this section is therefore also divided into subheadings explaining the creation of continuous lines, tonal areas and crayon textures.

Line

This section explains the various stages in etching a plate. Etching by drawing a needle into a ground is a basic technique – all other chemical procedures develop from this. Furthermore, the etched line relates to the engraved line and the line drawn with pen and ink, because it has the directness of the first and the freedom of movement of the second. Etching is therefore ideal for the artist who is not a trained engraver, allowing him to transform his ideas into print.

Degreasing
The surface of the polished plate must be degreased to ensure that the etching ground adheres well. If the plate is not

thoroughly free of any residue of oil or fat, then the ground may lift during the etching process – at the very least the lines will take on an irregular or mottled appearance. In the past this was well understood and different degreasing materials were available. To modern etchers, however, the irregularities may result in interesting visual effects that are sought deliberately.

Both in earlier and in modern times, the plate is rubbed with a cloth and chalk powder (whiting).[562] If necessary, the chalk can be mixed to a paste with some water or alcohol. The powder is slightly abrasive and chalk absorbs oil well. A modern printmaker might use magnesium carbonate instead of whiting to the same effect.[563] Rubbing with lemon juice, a dilute alkaline solution or diluted ammonia also works well. Paint thinner was a popular degreaser in the second half of the twentieth century until it was discovered that its vapours are harmful to the human brain and nervous system. A more modern variation utilises a solution of various soaps and surfactants (used, for example, for preparing doors and window frames before painting). The degreased plate is rinsed with water, wiped dry with a clean cloth or paper tissue and remains untouched until the etching ground is laid.

Ground

The surface of a plate is covered with a resist, an 'etching ground', and the design is drawn into the ground with a needle, laying bare the metal. The acid bites the metal through the lines in the ground according to the design, the ground is removed and the image created can be printed. Acid-resistant layers of plain beeswax, oil paint or oil varnish were used for etching printing plates in the sixteenth century. Between 1600 and 1630 more complex formulas were developed, wax being mixed with either resin or asphaltum, and plain grounds became obsolete. From 1630 up to the present, the standard etching ground used is a mixture of resins, asphaltum and wax melted together. Acrylics came into use as etching grounds from the mid-1990s.

Wax, oil paint and oil varnish are the first grounds mentioned in mediaeval etching recipes.[564] The oldest prescriptions explain how to dip the iron object in molten wax or brush on some molten wax, where it immediately cools and congeals. Another way is to warm the plate, hold a piece of wax against it until the wax melts and spread the molten wax over the metal. After cooling, the design can be drawn into the wax immediately. The use of plain wax lasted until around 1600 when more refined etching ground recipes were developed (see below).

The earliest oil ground recipes prescribe how to prepare a mixture of linseed oil and pigment, in other words how to make an oil paint. The object is brushed with it and left to dry, which takes a week or longer. The oil dries by oxidative polymerisation of the unsaturated fatty acids in the oil.[565] A number of recipes recommend mixing the oil with a lead pigment, such as red lead, lead white or yellow lead. These pigments act as driers (siccatives), catalysing the process of oxidative polymerisation.[566] Early recipes for oil grounds do not give details about the state of the oil, but combining it with a drier suggests that a raw or a briefly boiled oil is intended, in which case it can be regarded as a kind of oil paint.[567] The term 'painter's varnish' is used after 1500, which may refer to a thin oil varnish used for coating oil or tempera paintings.[568] The drying process can be accelerated by heating the oil in advance to start the process of polymerisation; further addition of resin creates a strong and durable ground. Such an oil-resin ground is called a 'hard ground' (*vernis dur*) by Bosse, on account of its high resistance.[569] The *vernis dur* is applied and the plate heated until the ground no longer smokes.[570]

Wax, varnish and oil paint

When Vasari published the second edition of his *Vite* (1568) he paid some attention to etching printing plates in his biography of Marcantonio Raimondi. All known etching recipes up to then were intended for the decoration of objects, and the grounds used were wax, oil varnish or oil paint. Vasari also mentions these materials in his discussion of etching printing plates: *cera*, *vernice* and *colore a olio*.[571] Benvenuto Cellini, who published his *Due trattati* in the same year, includes an actual recipe for etching a copper printing plate. For the ground, he says, ordinary (oil) varnish (*Vernice ordinaria*) is slightly heated and a little wax mixed in; this mixture is applied warm, not hot.[572] The combination of oil varnish and wax is not found after this date with the exception of one reference by John Bate in 1634.[573]

Its replacement was the combination of oil with resin, which is Bosse's *vernis dur* and probably the Italian *vernice*.[574] De Mayerne (c.1630) gave the recipe for the varnish Callot used, which came from Florence where they called it *Vernice grossa de Lignaiuolo*.[575] The varnish contained two parts of resin pitch and two parts of Greek pitch mixed with two parts of nut or linseed oil (ratio 4:4:4). According to De Mayerne, it was used by the joiners (*menuisiers*), but was too thin for use as etching ground, for which he recommended taking only half a part of oil, giving a ratio of 4:4:1. Compare this with Bosse's *vernis dur* that contained five ounces of colophony resin and five ounces of Greek pitch boiled together with four ounces of nut oil, giving an in-between ratio of 5:5:4. A portion of the ready-prepared varnish, which Bosse, like De Mayerne, called *vernice' grosso da lignaioly*, was given to Bosse by Callot.[576]

Cochin, editing Bosse's treatise in 1745, still mentions hard ground but regards it as old fashioned.[577] Nevertheless, recipes for oil ground are found regularly throughout the eighteenth century, and linger on in articles and magazines afterwards. Apparently, Bosse's authority alone was sufficient for the recipe to continue to be copied, although it may be questioned as to whether it was still used then.[578]

Soft etching ground

Art history scholarship maintains that early seventeenth-century changes in the aesthetic qualities of etchings were due to the change from a hard to a soft ground, the latter supposedly invented by Swiss engraver Dietrich Meyer around 1603, who transmitted it to his apprentice Matthäus Merian around 1610.[579] A comparison of recipes for etching ground confirms changes in ingredients used after 1600, but there was gradual adaptation. First the plain wax ground was modified by melting it together with resin; some soot could be added as colorant. Recipes of wax with either asphaltum or resin can be found until the 1660s.[580]

From this developed the standard etching ground recipe – used from about 1630 until the present day – that contains three basic ingredients: asphaltum, one or more resins, and beeswax.[581] The oldest of its kind presently known is that in Van Dijck's Antwerp sketchbook: *1½ ons aspaltum, ½ ons terrementijn, ¼ reusen herdst, 1 ons witen was*.[582] This gives a ratio of 6 parts of asphaltum to 3 parts of resins to 4 parts of wax. No reason is given for this change from plain beeswax to the more complicated mixture. Plain beeswax can, but should not, be sticky and although the needle does remove the wax, it often adheres to the plate in little lumps that the etcher must take care not to push into the drawn lines again. Wax also causes 'drag lines' in cross-hatching, the second crossing line dragging with it part of the first drawn line. Adding resin and asphaltum to the wax gives a ground that is less sticky (depending on proportions). Drawing is easy – the bits of ground that flake off can be brushed aside without the appearance of drag lines.

A great many variations of this mixture can be found. The basic ingredients remain the same, but the proportions are highly individual to the degree that if ingredients in a particular ratio are found in a later recipe it is almost certainly a copy of an earlier version. For example, Bosse, who calls a ground with these ingredients *verny mol*, uses ½ ounce of asphaltum, 1 ounce of mastix and 1½ ounces of wax, giving a ratio of 1:2:3.[583] When a recipe with asphaltum, resin and wax in the ratio of 1:2:3 is found, one can be certain the author copied Bosse's recipe or had been informed by someone using it.[584]

A soft ground is made by first grinding the asphaltum and resin to powder and cutting the wax to flakes. Wax has the lowest melting point, resins melt at higher temperatures and asphaltum has no fixed melting point because it is a compound of different materials. Two production methods are mentioned: either the asphaltum is melted first, the resin mixed in and finally the wax added, or first the wax is melted and then the powdered ingredients blended in. Theoretically the first method should give a more homogeneous ground: when the temperature is not high enough, although the powder can be mixed in the molten wax, the resin and asphaltum will not melt and remain in the mixture as fine grains. The liquid mixture is poured into a basin with cold or tepid water, it floats to the surface and is kneaded into balls or cylinders before it congeals.[585] Modern producers of etching ground cast the molten ground into metal moulds.[586] Bosse recommended keeping a ball of ground in a piece of fine cloth to allow larger particles to filter out during the application of the ground onto the plate.

A large variety of ball ground recipes have circulated over the years and today most etchers use such (classical) ball grounds. Resins and gums from Asia and South America were introduced as new ingredients for etching grounds and stopping-out varnishes in the nineteenth century, but their application was short-lived.[587]

Applying the ground

Both hard and soft grounds are applied by heat. Drops of the hard oil ground are spread over the plate and by tapping with the ball of the hand the surface is coated. Next the plate is heated on a stove in a hearth until no more smoke comes off; after cooling this provides a strong and resistant layer.[588] For soft, wax-based ground, the heat of a smouldering charcoal fire will suffice. The difference is due to the ingredients: the hard ground needs to be heated until the oil polymerises, which happens at around 300°C whereas the soft ground is applied at a temperature at which all the ingredients melt, somewhere between 100 and 120°C.[589] If either of the grounds gets too hot it will char and become useless.

The stove upon which the plate is heated consists of an iron basin for retaining the live charcoal with an iron grid above. The charcoal needs to supply just enough heat to melt the ground. The heat can be regulated to a certain extent by covering the live coals with ashes although care must be taken to prevent the ashes from flying around and ending up in the melted ground. Around 1840 the English engraver Le Keux invented a *rechaud*, a square rectangular box that could be filled with boiling water through a tap. An alcohol burner underneath keeps the water boiling, and the rising steam heats the lid of the box, which is enough to melt the etching ground.[590] The gas stove appeared in the second half of the nineteenth century and the electric hotplate is first mentioned at the beginning of the twentieth century.[591]

When hot, the plate is touched in many places with a piece of the soft ground which is spread using the longer barbs of a feather until the surface is completely covered; feathers of ducks, geese and ravens are mentioned.[592] Schoonebeek (1698) described a refined version of this technique in which the ground is first spread with the shorter barbs of the feather then with the longer barbs.[593] Later authors used a leather-covered printing ball or roller for this.[594] Lalanne (1866) mentions both a dabber and a roller.[595] Koehler (1880) translated accordingly and added rubber rollers because the type of roller described by Lalanne was not available in the USA.[596]

On steel the layer of soft ground needs to be thicker than on copper. The temperature of the plate, for applying the ground, should also be lower than on copper to prevent the formation of honeycomb structures.[597]

Liquid grounds prepared with a volatile organic solvent, such as (rectified oil of) turpentine, chloroform or ether came onto the market after 1860 when distillates from mineral oil became available on a large scale.[598] Liquid grounds are applied by placing the plate almost upright, pouring the ground from the bottle along the top edge and letting it run down until the plate is completely covered (see Fig. 105, p. 111); after evaporation of the solvent a homogeneous layer remains.[599] A small machine can be used upon which the plate is placed, some ground poured in the middle and the plate turned by a system of cogwheels. By centrifugal force the ground is spread to the edges of the spinning plate and evenly divided before the solvent evaporates.[600] Brushing on a liquid ground is common[601] but always leaves dust particles that cause foul biting due to the acid that penetrates through the small holes made in the ground by the dust.

The evaporation of the solvents in liquid grounds – and worse still the solvents used in cleaning off the grounds after etching – caused serious health problems, the neurotoxic vapours of the solvents acting on the brain and nervous system.[602] A number of alternatives for these toxic liquid grounds were suggested and developed in the 1990s including oil-based printing ink and plain wax; these hark back on the sixteenth century but it was not realised then. Liquid acrylic grounds were developed from the mid-1990s and are becoming more popular.[603]

Stopping-out

Stopping-out varnish is a liquid type of ground that is brushed onto the plate to cover the edges and the back of the etching plate, to repair mistakes in the ground and is used when biting in stages. Its application can be seen in etchings from the second half of the sixteenth century as evidenced by the typical traces of brushstrokes it leaves. Recipes for stopping-out appear around 1630 and include various kinds such as tallow with olive oil, ball ground in oil, and pitch or resin dissolved in turpentine oil. The recipes gradually shift from tallow in oil to resin in turpentine until mixtures of tallow in oil are no longer found in the nineteenth century. Resin or etching ground in turpentine solutions continued to be used.[604] Stopping-out recipes composed of pitch or shellac in alcohol appeared late in the eighteenth century and are still used today.[605]

Mistakes in drawing in wax-based grounds can also be corrected by touching the wrongly drawn lines with a warm, but not too hot, metal tool in order to close the lines by melting the ground around them.[606] This does not work with other kinds of grounds, however, because these are less malleable when heated.

Stopping-out varnishes were originally intended to cover the sides and backs of plates, and to repair defects in the ground, but gained importance due to the development of multiple biting in the sixteenth century. More refined, they were applied in aquatint etching in the eighteenth century.[607]

Drawing

Both the hard and the soft grounds can be smoked to blacken their surfaces or they can be covered with a white coating. These techniques allow the etcher to view the design transferred onto the ground more easily. It is also easier to see the reddish copper of the drawn lines, which contrast less with the red-brown layer of the ground. Colouring the grounds themselves for this purpose is found in English sources only.[608]

Drawing in an etching ground is done with a needle of round section set in a handle or with a steel pen with a sharpened round point that can be used in the same way as with any pen or stylus. Daniel Hopfer, the first to etch intaglio printing plates, came up with the idea of creating lines of different widths by using needles with square tips of two or three different widths.[609] Because Hopfer used iron plates, the coarse open texture of the wide grooves held enough ink to print a black line.

A variety used by Jacques Callot and Stefano della Bella is the *échoppe*, a round needle cut obliquely to create an oval point (Fig. 179).[610] By turning the point to a larger or narrower part of the oval respectively broader or finer lines can be drawn with fluent transitions from broad to fine. By turning the needle, the sharper or the flatter part of the oval point scrapes the ground and the plate is etched only once. A skilful hand can use the tool to imitate the swelling and tapering lines typical of the style of engraving developed in the late sixteenth century (see Fig. 128). The *échoppe* is described and illustrated by Bosse, who propagated it for the production of etchings with lines resembling swelling engraved lines.[611] What is more, he considered that the principal intention for etchers ought to be that their prints should look like engravings.[612] Bosse's use of the *échoppe* can be distinguished in the illustrations to his treatise. The description of the tool is repeated in the editions and reworked versions of his manual, but we only rarely recognise traces of the use of the *échoppe* in etchings by others.[613]

Instead of the *échoppe*, systems were developed using needles of various widths, whereby the thinnest lines are drawn with the thinnest needles and the wider ones with thicker needles.[614] Note that when drawing with a needle with a sharp point through a ground, a thin line is created by the point moving through the ground and lightly scratching the surface of the plate. It is only the very point of the needle that counts, however – the remainder of the shaft of the needle, whether thick or thin, makes no difference; thicker needles as such will not give wider lines. What makes

the line wider is that in drawing the needle scratches the surface of the plate. The etcher can move a sharp needle very lightly over the plate, merely touching the metal. Using a stronger thicker needle, the etcher can force the needle deeper into the copper,[615] – more metal is scraped away, the initially drawn line is wider and deeper, and in etching a wider line therefore appears quickly.

Etching did not give rise to the same kinds of systems that developed in engraving in the sixteenth and seventeenth centuries, except when both techniques were combined. Instead the personal 'hand' of the etcher was of greater consequence, such as the loose style of Jacques Bellange and Pietro Testa, and the scribbling manner of Giovanni Benedetto Castiglione. Rembrandt's loose manner of drawing etchings was based on earlier methods but it inspired many to free themselves from the more strict *ductus* of the burin.

Other equipment

Rulers and parallel rulers, square edges and compasses are usually depicted in engravers' studios and described now and again. More complicated expedients are compasses for drawing spirals that appeared in the early sixteenth century.[616] The pantograph invented by Christophorus Schreiner in 1603 is a tool that would have been known to engravers because it is useful in enlarging or reducing a design, but is rarely mentioned in connection with etching or engraving.[617] All this equipment has been used in making preparatory drawings, but with some adaptation – such as replacing the drawing point by a needle – could also have been used to draw directly on the plate. There is, however, no reference that this was ever done.[618]

From around 1800, revolving drawing boards and all kinds of supportive instruments appear. These were made especially for engravers for manipulating large plates and describing ellipses, making perspective drawings and other more complicated designs, and allowing precise repetitions and designs.[619] Ruling machines developed in the same period and for the same purpose (see below).[620]

Etchant/mordant

Metals can be etched with mineral acids and with solutions of salts. Etching copper intaglio printing plates in nitric acid is first referred to by Vasari (1568) and common from the seventeenth century up to the present.[621] Cellini published a recipe for making an etching on a copper plate, including how to prepare a mordant for etching copper from different salts in lemon juice, or alternatively different salts in strong vinegar. This chapter is followed by a prescription for making nitric acid, of which it is often said that Cellini also suggested etching with nitric acid. Comparison of the text of his manuscript with the printed text shows that Cellini made a clear distinction, describing two kinds of 'strong water' (*acqua forte di due sorte*). The salts-in-lemon-juice mordant is for etching a copper intaglio printing plate (*da intagliare*) and the nitric acid is for parting gold and silver (*da partire*).[622] Consequently Cellini did not intend the nitric acid recipe for etching printing plates although other engravers did etch with nitric acid.

Nitric acid

Nitric acid has the advantage of biting quickly when fresh, but the process requires constant attention. During the chemical reaction, nitrogen oxide gases are produced (Table 1), which show as bubbles adhering to the bare metal of the drawn line. The bubbles hamper the action of the acid and if not removed result in the etched line looking coarse and irregular. Larger hatched areas will show a typical 'bubble stucture' of series of darker rings around lighter spots (see Fig. 132; see also Fig. 56, p. 54), because the acid bites around the bubbles and cannot react with the copper un-

Table 1
Etching copper with nitric acid
$Cu + 2HNO_3 \rightarrow Cu^{2+} + 2NO_3^- + 2H^+$
$3H_2 + 2HNO_3 \rightarrow 4H_2O + 2NO$ (gas)
$2NO + O_2 \rightarrow 2NO_2$ (gas)
Etching zinc with nitric acid
$Zn + 2HNO_3 \rightarrow Zn^{2+} + 2NO_3^- + 2H^+$

derneath them.[623]

A feather is brushed across the plate repeatedly to remove the bubbles which also refreshes locally exhausted acid – the motion of the liquid keeps its composition and activity homogeneous. Etching metal with nitric acid is an exothermic reaction, ie warmth is released during biting, and the warmer the acid the faster the biting: as a rule of thumb an increase of temperature of 10°C doubles the speed of etching. A further effect of feathering the plate is therefore

the prevention of local differences in temperature, which similarly promotes differences in line widths. Feathering is therefore necessary for regular and continuous etching, which results in an even quality of the image.

The nitrogen oxide gases that rise from the bath have a foul smell and are toxic. Etchers were well aware that these vapours were harmful to their health and a variety of solutions was sought to deal with the problem (Fig. 180).[624] The simplest ways are opening doors and windows to provide good ventilation during etching, working outside, or employing someone else to do the dirty work.[625] Smoking during etching suppressed the pungent smell, but did not reduce the aggressive action of the gases (Fig. 181). Placing a glass containing ammonia next to the bath makes the vapours react with each other and condense.[626] Covering the bath with a glass plate limited the diffusion of the vapours but the glass had to be lifted for feathering the plate regularly, allowing the gases to escape. Josef Roller (1888) therefore recommended handling the feather through a small opening on the side.[627]

These were all minor improvements in working conditions, suitable only when working with small plates and small amounts of acid. A more effective solution, taken from the chemist's laboratory, was to etch in an acid cupboard with an exhaust.[628] This was the strategy commonly followed by printmaking studios in the twentieth century.[629]

Salts-in-vinegar

The best way is to tackle the problem at source and use mordants that do not produce harmful vapours. In tandem with nitric acid, etching with salts solutions was also carried out, which Bosse found healthier than nitric acid.[630] The salts solutions were used until 1900 and reintroduced in the search for improved working conditions at the end of the twentieth century.[631] They are mixtures of one or more salts in water, vinegar or another liquid. The mixtures are prepared cold and readily act on aluminium, iron and zinc. Reactions with copper are slow – they may take a few weeks to a month to produce tangible reliefs, depending on the recipe and on the strength of the vinegar.[632]

A salts-in-vinegar mixture may be boiled to concentrate it. This decreases the etching time and makes it suitable for etching copper, but is still slower than nitric acid. A fresh amount of nitric acid may take fifteen minutes to etch a line of a particular width in copper whereas the boiled mixture may take two hours.[633] There is an economic advantage in that the etcher could easily make it himself rather than having to purchase nitric acid. The mixture produces some hydrogen gas during biting, but its bubbles are smaller and cause less of a hindrance to etching, although they do also have to be removed regularly. Sediment forms in etching with a salts solution and has to be removed as it also retards biting. A further advantage is that no toxic gases are given off from the bath.[634]

Etching copper printing plates was first performed with nitric acid, both in Italy and the Netherlands; alternative recipes for salts-in-vinegar mordants appear in Italy in the 1560s.[635] Bosse prescribed boiling in three pints of strong vinegar four ounces of copper acetate, four ounces of ammonium chloride and six ounces of kitchen salt. Here we see the same phenomenon as mentioned above with the etching grounds, ie that these ingredients in a ratio of 3:4:4:6 form almost a kind of fingerprint. By comparison, the different later copies of Bosse's mordant recipe can be traced from Italy c.1600 until the mid-nineteenth century, with some variations in the amount of vinegar and here and there an extra ingredient (Table 2).

Going back in time, almost the same recipe is noted by Turquet de Mayerne as *Methode de Callot, Composition de l'eau* about 15 years before Bosse published his manual. Before that, the same materials in the same proportions are found in the ledgers of the administration kept in Florence (1616, 1620), where Callot worked, as well as in Padua (1590–1625).[636] Callot in his turn may have learned etching, and thereby the recipe of the mordant, in Rome when he worked with his fellow countryman, the engraver Philippe Thomassin. Richard Symonds wrote down the same recipe in his diaries for 1649–1651, when travelling in Italy.[637] Knowing Bosse received some *vernice' grosso da lignaioly* from Callot (see above), he would also have learned this mordant recipe from him. Symonds's reference may mean the recipe was still in use when he visited Italy. Alternatively, his use of the additional German term *Etzwasser* may indicate that he gained the information from a German engraver.[638]

Bosse mentions that nitric acid is bought at the refiners.[639] The salts-in-vinegar mixture has to be self-made and he gives a recipe.[640] He used the mordant in combination with the hard ground (*vernis dur*); nitric acid was used for the soft etching ground (*vernis mol*).[641] The manner of etching is different, too. A plate covered with hard ground is placed on the slanted board and the salts solution poured over it frequently, the streaming liquid preventing the formation of gas bubbles and carrying off sediment.[642] The other way is to 'wall' the plate with beeswax and pour a centimetre or so of nitric acid on the ground within.[643] Any gas bubbles that would hamper the chemical process are brushed off.

Mordants for steel plates

Nitric acid and salts-in-vinegar mixtures were the mordants used throughout the early modern era and references to both are found in abundance. Developments in chemistry from the later eighteenth century onwards led to the discovery of a host of new elements and chemical techniques such as new etching fluids and techniques that had a dramatic effect on printmaking.

Iron can be easily etched with weak nitric acid, which bites the metal quickly. Charles Warren (1823) experimented with etching steel for which he mixed copper nitrate in water with some nitric acid added. The fluid had to be applied

thinly ('one sixth of an inch') on the plate, moved about continuously and replaced after ten minutes. The etching was slow and re-biting unsatisfactory, but the lines etched were thinner than in copper.[644]

Warren's acid fluid was not suitable for plates drawn with a ruling machine – such lines are fine and require short undisturbed etching. The drawback of his mordant was that it created iron compounds, which settled in the lines and hampered the corrosion.[645] Thomas Lupton (1823) at least was not happy with it and suggested that the Society for the Encouragement of Arts, Manufactures, and Commerce should 'offer a reward for an acid, for etching on steel, as that now seems to be the chief difficulty in its way'.[646]

Edmund Turrell (1824) solved the problem by adding alcohol to a mixture of acetic acid and nitric acid.[647] The alcohol has a parting effect, which prevents the settling of iron compounds. The comment was that it dissolved the Brunswick black stopping-out varnish normally used. Generally, Brunswick black is asphaltum powder dissolved in turpentine to which resin can be added. According to Turrell, he did not have the problem as he worked with asphaltum varnish. This is asphaltum powder dissolved in turpentine oil without the resin – it was the resin that caused the problem because it could be dissolved by the alcohol contained in the etching fluid.[648]

By 1826 any difficulties in etching both hard and soft steel plates were resolved by the recipes and processes developed by Cooke Jr. and Humphrys. Mordants for the harder steels needed the addition of acetic acid; for the softer varieties they suggested solutions of different salts, which proved successful.[649] Their inventions were adopted by other English engravers, the recipes appearing first in many journals in England and then abroad, with other more refined recipes following.[650] The combination of steel plates with a suitable mordant allowed for the etching of the finest lines, needed for the imagery *en vogue* in England at that time, as well as printing the plates in runs of tens of thousands, which was not possible from copper.

New mordants for copper

Querfurt (1792) suggested, as an alternative for nitric acid, etching copper with a silver nitrate solution, which he found to work better[651] and which does not produce toxic gases.[652] Silver nitrate is mentioned by several authors, but on the whole is hardly used, probably on account of its cost and its toxicity.[653]

The introduction of steel printing plates concentrated developments on mordants for etching steel, but copper became the preferred choice again with the introduction of steelfaced copper plates in 1858 so mordants for steel became redundant. Steel engraving was already in decline due to the vagaries of fashion and other printmaking processes that had become more popular.[654]

Ferric chloride ($FeCl_3$) was first tried as an etching fluid by one of the pioneers of photography, William Henry Fox Talbot, in the 1850s (Table 3). It proved to be a versatile and reliable mordant and is referred to in nineteenth-century etching manuals, especially for use in photogravure.[655] It is found regularly in twentieth-century, mainly English, printmaking manuals.[656]

Talbot reports that ferric chloride is excellently suited to etching copper, steel or zinc 'and does this without disengaging bubbles of gas, or causing any smell, for which reason it is much more convenient to use than aquafortis [= nitric acid], and also because it does not injure the operator's hands or his clothes, if spilt upon them'.[657] The etching certainly proceeds well, but for the rest Talbot is somewhat optimistic. Chlorine gas is released when etching zinc, which is pungent and aggressive. Ferric chloride is corrosive and should not be handled without protection. The liquid stains skin and clothes.

The disadvantage of etching copper with ferric chloride is the precipitation of black iron compounds that settle in the grooves and hamper regular etching. This was overcome in the printing industry by the addition of hydrochloric acid to the bath or by washing the plate with a solution of vinegar and kitchen salt after etching. A recent addition is citric acid, which prevents the formation of iron compounds. This is the so-called 'Edinburgh Etch', named after the Edinburgh Printmakers Studio where its inventor Friedhard Kiekeben was working in 1997.[658]

Chromic acid is mentioned between about 1880 and 1920.[659] Again, it was observed that it has the advantage of not producing irritating gases, but it acts very slowly and 'it is so dark in colour that the plate requires to be removed from the bath in order that the effect upon the copper may be observed'.[660] The drawback of chromic acid is that it is even more toxic than nitric acid if it comes into contact with the skin or if inhaled as mist.[661]

Dutch mordant

Hydrochloric acid was recommended by Deleschamps (1836) to clean oxidised metal plates. It can be used for etching zinc and added to nitric acid ensures homogeneous etching of bronze.[662] Villon (1914) suggested it for etching aluminium, and mentioned Pinchault and Lygny who patented etching with hydrochloric acid as a replacement for nitric acid in 1882.[663] But on the whole the acid is only used occasionally for etching.[664]

It can be used to better effect if mixed with other chemicals. German chemists Schwarz and Böhme developed a new etchant for copper before 1848 made up of a mixture of 2 parts of chlorate of potassium in 20 parts of water and 10 parts of hydrochloric acid (40%) in 70 parts of water.[665] The simplified ratio is 2:10:90 (the latter number is the total amount of water).[666]

The mordant and the names of both chemists were mentioned in *The Art-Journal* of 1849.[667] From then on the recipe found its way to English artist-etchers and Seymour Haden described the mixture in 1866.[668] It was referred to by English etchers as 'Dutch Mordant' or 'Dutch Bath', as Hamerton did in 1881.[669] Apparently, after 30 years, the historical background of the etching fluid was forgotten. Because the English etchers used the term 'Dutch', Hamerton assumed it had been invented in Holland, mistaking 'Deutsch' for 'Dutch'. Since then the mixture has been referred to as 'Dutch' mordant and its German origin has sunk into oblivion.[670] Nevertheless, Félicien Rops (1873) knew about both. He noted the recipe of Dutch mordant according to Seymour Haden and that by Schwarz and Böhme, and he distinguished between the actions of the two etching fluids.[671]

Short (1888) gives three reasons why Dutch mordant is preferred to nitric acid: (1) 'the lines are finer in quality, going deeper in to the plate without widening so much'; (2) 'this is the mordant used for working in the bath, because, being slow in action, it allows time to finish the design without the lines first drawn being bitten deeper than they should be'; (3) 'the slight chlorine gas given off is not unpleasant or injurious, whilst that from the nitric bath soon gets unbearable, and is very injurious to the chest'.[672]

I would add the following comments to Short's statements: (1) the etchant bites a sharp, crisp line because no large gas bubbles sit on the edges of the grooves and no sediment is produced, which makes it well suited to detailed work; (2) the English etcher Haden developed a system of needling the plate while it was in the bath, which suited the more sketchy way he worked as compared to the precise manner of the steel engravers active before him; (3) again, the reason for choosing another mordant was because of the toxic gases given off by the nitric acid. Short was wrong about the gas coming off the bath, though – the chlorine gas is obnoxious and aggressive.

Comparing later recipes for Dutch mordant shows that they are in keeping with the original recipe by Schwarz and Böhme with little variation. The solution is strengthened by proportionally decreasing the amount of water, sometimes by increasing the amount of hydrochloric acid, or by doing both.[673] Frederick Barff (1876) suggested an improvement: by mixing one part of hydrogen peroxide to two parts of hydrochloric acid, he claims, 'no gas is given off, and no substance is formed which interferes with the steady action of the etching liquid'.[674]

Other mordants

Schwarz and Böhme also developed a mordant for etching steel: a mixture of 2 parts of iodine and 5 parts of iodine of sodium, or of potassium, in 40 parts of water. According to a contemporaneous author: 'the lines are very deep, exceedingly straight, and the finest lines will flow together'.[675] Little information about this etchant ever appeared although Félicien Rops used it to work on steel and steelfaced plates.[676]

Sulphuric acid is not used in etching metal plates although it can be used to treat wood.[677] 'Etching' is not the proper term here, as there is no redox reaction between the wood and the acid. Instead the hydrogen bonds between the cellulose molecules of the wood are removed (dehydration), which makes the fibres of the wood shrink away where the sulphuric acid makes contact. Treated in this way, these blocks are printed in relief only.[678] However, by sealing the surface of the block with a lacquer and using guides on the roller press, woodblocks can also be printed in intaglio.

Organic acids, such as acetic acid (vinegar), gallic acid, oxalic acid or tartaric acid are too weak to etch metals, but they are found in mixtures with salts, as mentioned above.

Etching methods

Acids and salt solutions are liquids. Five basic etching methods have been developed that can control the mordants in such a way that ensures constant and homogeneous biting of the plate.

Salt solutions can be mixed with a charcoal powder or gel to keep the liquid together. Gels are mentioned in a recipe from the Lucca manuscript (c.800) and from the ninth-century *Mappae clavicula* and its copies, and thus will have a common ancestor.[679] A large group of etching recipes from the fourteenth to the early seventeenth century explain how to mix salts and charcoal powder and wet the powder with strong vinegar to form a paste. A third means of keeping the salts together is by placing them in a linen bag the size of the part to be etched. Some vinegar has to be poured on it regularly to keep the bag moist and the mordant active, as with the charcoal mixture.

For the curved surfaces of armour, a rim is built around the area to be etched with 'walling wax'. First described in the fifteenth century, walling wax was applied to printing plates until long into the twentieth century.[680] Walling wax is plain beeswax to which turpentine, oil or oil varnish can be added to soften it. Later recipes also contain asphaltum, pitch or resin.[681] Bishop (1879) first gives a common recipe made up of asphaltum, beeswax and linseed oil.[682] But then, typical for the later nineteenth century with its keen interest in all kinds of new materials, he recommends borders made of *gutta-percha*, a kind of natural latex.

A roll of wax is kneaded into shape and stuck to the edges of the plate (Fig. 182). To improve adherence, the wax is melted locally to the plate using a warm iron object.[683] Schoonebeek (1698) describes and illustrates how the etcher has to ensure that no light is visible between the wax and the plate to prevent leakage.[684] The acid is poured within the wax rim – only the part to be etched needs to be covered with acid – thereby saving material. Nitric acid is suita-

ble for this method. It is poured on the plate a few millimetres deep and is stirred with a feather regularly to remove the bubbles that appear on the copper in order to secure constant and homogeneous biting.[685] A salts-in-vinegar solution would be exhausted too quickly and leave too much sediment in the grooves.

Alternatively, mordant can be poured continuously onto the plate and allowed to flow over it until the grooves are sufficiently deep. This was needed with salt solutions because the free-running fluid prevented the sediment created from settling in the grooves.[686] This technique was formalised by means of a so-called 'etching machine', although all actions were performed manually. The plate was placed on a slanted wooden board with holes into which pins were stuck to support the plate. The acid ladled over the plate flowed down into a trough and into a hole in the bottom into a tub, from where it was ladled back over the plate again.[687] The plate has to be turned regularly to ensure homogenous biting. This is a time-consuming task – it takes two hours using a salts-in-vinegar mixture according to De Mayerne – that was probably left to an apprentice (Figs 181 and 183).[688] With this technique, the sides and the back of the plate have to be covered with stopping-out varnish to prevent corrosion.

The (true) etching machines developed in the earlier twentieth century were based on the same principle. About a quarter of a closed box was filled with acid and a wheel with paddles formed into cups lowered into the fluid. The prepared etching plate was attached to the inside of the lid of the box, the lid was closed, and the acid was scooped up and splashed directly or indirectly against the plate, thereby etching it; more refined versions have since been invented. As with the slanted board, any sediment is washed out of the grooves in the same movement and gases are driven off. The technique was originally used for making relief printing plates and is still used occasionally for small format intaglio printing plates.[689] It is an effective technique as the lines are kept open by the continuous flow of corrosive that prevents bubbles from forming or sediment from settling. When the liquid is poured or sprayed over the plate homogeneously this results in straight and even etched grooves.

Instead of retaining the acid within a wax wall, the plate can also be placed in a tray to retain the acid. After the design is drawn in the ground, the sides and back of the plate are covered with stopping-out varnish and the plate dipped into the acid.[690] Although this may be the method mentioned by Vitalis de Furno in the fourteenth century, it is not decribed before 1701 in an extra paragraph added to the second edition of Bosse's treatise.[691] Pouring the acid into a tray and leaving the plate in the acid became the most common way of etching a plate.

Small plates can be etched in a glazed earthenware bowl although this has not been mentioned in any early source. The tray described by Le Clerc, the editor of Bosse's second edition, is made of wooden planks and covered with some layers of oil varnish to prevent leakage. The illustration shows the etcher rocking the tray on his knees, although this seems impractical because of the risk of acid being spilled over the edges (Fig. 184).[692] The other option shown is to place the tray on a cylinder on a table. The acid is kept in motion by slowly tilting the tray up and down repeatedly. Etching in a tray must have been a new concept at that time as it was followed by more professional apparatus. German eighteenth-century sources depict and describe a tray placed on or in an actual cradle (*Aezwiege*) (see Fig. 181).[693] The cradle stood on the working bench and the etcher (carefully) rocked the cradle to and fro to either prevent sediment from settling in the grooves or to disperse gas bubbles. The *Encyclopédie* (1767) demonstrated an automated technique of rocking a bath with the aid of a clock-like mechanism.[694] Mid-twentieth century line-relief plates were etched in closed baths that were agitated 30 times per minute.[695]

Electrolytic etching

Research into electricity in the 1830s produced electric batteries made of a copper plate and a zinc plate suspended in a solution of copper sulphate and sulphuric acid. As previously mentioned, Thomas Spencer observed in 1839 that copper was deposited on the copper plate (– pole, cathode) and the zinc plate (+ pole, anode) was etched. He identified advantages in both and applied for a patent, which was granted to him and John Wilson in 1840.[696] The deposition of metal was turned into the galvanisation of a metal object with a thin layer of another metal, further resulting in the replication of printing plates in the 1840s, called 'electrotype', and in the steelfacing of copper plates in 1857.[697]

The corrosion of the anode developed into 'electrolytic etching', or 'electro-etching'. With this technique, the plate prepared for etching is connected to the anode (+ pole) of a battery and placed into a bath of copper sulphate which also contains the cathode (– pole). The electric current runs through the anode and material is removed from the plate where metal lays bare.[698] Manuals referring to electrolytic etching appeared regularly throughout the nineteenth and twentieth centuries.[699] Gottfried Wilhelm Osann, for example, described the process for making both intaglio and relief printing plates in 1842.[700] The author recommended his technique to his fellow scientists for the creation of printing plates for illustrations in their books, suggesting that they could do it themselves. He claimed that it was so easy it could be done on a scientist's desk.

The technique has never been popular with printmakers despite the fact that it does not produce toxic vapours and it bites clean straight lines. Setting up the equipment and the baths demands some knowledge of electricity and the handling requires discipline. It is therefore unsuitable for classroom situations as students tend to work rather messily – it is more applicable to a private studio.[701] Nevertheless printmakers regularly stumbled on the process and some devoted their time and energy to it.

Multiple biting

As has been discussed above, the earliest etchers (on iron) either drew two or more lines closely together or used needles with square tips in order to produce broader etched lines. The method that would become a standard procedure was biting in stages, or multiple biting as it can be called. Etching in stages gives the prints a livelier appearance with more spatial depth. Some early sixteenth-century prints by Daniel Hopfer show etching in stages, but this technique does not seem to have been continued by other etchers on iron.[702] Both Augustin Hirschvogel and Hieronymus Cock etched their designs in stages – but on copper plates – by 1550.[703] Their working practices are comparable as neither Hirschvogel nor Cock used stopping-out varnish.

Hirschvogel's method, as seen in his *Konkordanz und vergleychung des alten und newen Testaments* (1550) was slightly different from the way in which Cock worked.[704] Hirschvogel first drew the image with a normal etching needle, accentuating shades with a needle with a chisel-shaped tip as Hogenberg had done, and the plate was etched (Fig. 185). Next the second part was drawn and etched, and when needed a third part.

Examples of Cock's working style can be observed in prints for his series of views of Roman ruins *Praecipua aliquot Romanae antiquitatis ruinarum monimenta* (Antwerp 1551) (Fig. 186) in which he created tonal effects by biting in three stages, ie lines etched in three different widths can be seen. No traces of stopping-out varnish are visible and thicker lines cross thinner lines confirming that the foreground with the thicker lines was etched first; then the middle planes with less thick lines were drawn and etched; and for the background the finest lines were added and briefly bitten. Where, when or from whom he learned the technique of biting in stages or conceived of the idea is not known – there is a strong probability that he himself was the inventor. Giovanni Battista Pittone etched a copy of the same series in Venice in 1561.[705] Here all the lines are of equal widths suggesting that biting in stages was not practised by Pittone and his circle at the time or perhaps he could not be bothered.

An alternative is to stop-out parts of the design that do not require further etching.[706] The image is completely drawn, the plate etched for a specific period and then removed from the bath. The plate is dried and the parts that are ready are brushed with stopping-out varnish as they require no further etching. The Doetechum brothers, working for Cock, made etchings bitten in stages,[707] in particular for designs by Hans Vredeman de Vries. For example, in his *Scenographiae*, some plates show thin drypoint lines continued by etched lines, ie after the lines were drawn in the etching ground, the plate was scratched superficially and stopping-out varnish used to cover these parts again thereby biting the plates in three stages.[708]

More control could be achieved by using a slightly weaker acid for the second biting than that used for the first. The effects of the different strengths of acid were well known to etchers and there are references to mixing nitric acid with water in order to reduce its strength. No source prescribes changing the strength of the acid in the course of etching a plate. All biting seems to have been done with one bath with one exception found in an early seventeenth-century recipe on the back of a drawing that instructs the etcher to mix 'five parts of strong water with one part of rain water to bite the foregrounds'.[709] This etchant is again mixed with one part of water, either for biting the rest of the plate or for the background. It was not before the introduction of photogravure in 1879 that the use of baths of different strengths became standard.[710]

These two methods for biting in stages were used from the sixteenth to the nineteenth century. Then, as already mentioned, Seymour Haden (1866) conceived a third method in which he drew part of the image, immersed the plate in the etching bath and from time to time drew further on the plate while keeping it in the bath. A brilliant idea, according to his contemporaries, although rarely used by others.[711]

Reworking the etched plate

When the plate has been etched, it can be worked further by engraving, scraping and polishing. Finishing the etched plate with the burin is first observed in the etchings by Marcantonio Raimondi and Lucas van Leyden in the early sixteenth century. It is an obvious way of working because lines may be overlooked and shades may need strengthening, but it developed into an authentic method: the main design is created by etching and then the plate is completely worked over by engraving.

Re-biting an etched (or engraved) plate can be done by covering the surface of the plate with etching ground again, leaving the grooves open.[712] The difficulty is that thinner lines tend to fill up with ground, and to prevent this special grounds and techniques are suggested.[713] For example, rolling up the ground with a brayer gives better results than working with a dabber.[714] Normally grooves need to be traced once more with an etching needle to open them again.

'Woollet's method of re-biting' concerns rubbing the plate with a paste of chalk powder (whiting) and water, filling the grooves. After cleaning its surface, etching ground is applied and then the plate is etched, the acid dissolving the chalk and biting the grooves deeper.[715] In a more modern method, the grooves are filled with poster colour or gouache and the plate is covered with ground. Rinsing in water both cleans out the watercolour from the grooves and removes the ground on top.[716] The actual re-biting has to be brief because the ground tends to shrink away from the edges of the grooves, resulting in thinner layers locally that succumb quickly to the acid.[717]

Tone[718]

Creating tonal effects has always been high on the wishlist of engravers. As discussed above, of all the various mechanical methods devised for creating tones, mezzotint was the most suitable apart a couple of drawbacks: it is rather time-consuming to prepare the plate and does not allow for sharply outlined forms. Earlier combinations of etching or engraving for the key plate with background colours printed from a woodcut proved successful in the sixteenth and seventeenth centuries.[719] The downside was the combination of two different printing processes that made it difficult to print the design and tones in register. In addition, the tones were flat, and lacked refined detail and gradation in tonality. Apart from the more or less recognisable techniques described below, we are left with a host of prints that provide few clues as to how the plates were made. Etching invites experimentation and the opportunity was grasped with both hands.

Ink volume
Typical for etching is to utilise the possibilities offered by the controlled chemical action of the mordant with the metal, as in multiple biting. Etching for shorter or longer periods results in lines of differing thickness and, in particular, creates grooves of differing depths, allowing intaglio printing to be exploited to the full. With all other printing techniques tonal values are created by lines, dots or other textures set more or less close to each other, with finer or wider lines or dots, but the thickness of the ink layer per square unit of the print always remains the same regardless of the texture used, and differences are only two-dimensional. Intaglio prints also have textures, but additionally every dot and line is more or less voluminous – the longer the etching, the larger the volume of the groove and the more ink that can be retained. Consequently, a layer of ink varying locally in thickness is deposited on the paper, which is key to intaglio printing.

Another feature of intaglio printing is that the ink has a certain transparency that is related to the particle size of the pigment used for the ink. For all other printing techniques pigments of the smallest grain size are chosen to create opaque layers whereas intaglio printing ink requires relatively coarse pigment particles – a certain coarseness being needed because of the action of wiping the plate. If the particles are too fine, too much ink will be wiped from the grooves resulting in *manques* (white spots in the lines) while too much plate tone will stay on the plate's surface – the combination of the two may result in streaky impressions. When the ink is made with a relatively coarse pigment, wiping is easier and less plate tone is left, although the coarser pigment will also wear the plate faster.[720] It is important that intaglio ink should not be too opaque – the white of the paper should show through a little. This phenomenon is the basis for all tonal etching techniques.

Stippling
Just as with engraving, hatching more or less densely with an etching needle suggests tones, which is not so very different from hatching with pen and ink. The etcher can achieve more refined tones by dotting more or less closely. It is common to render skin in that way or at least to use dots in combination with lines for the transition from light to shadow when expressing volume. Examples can be found in etchings by Daniel Hopfer, Albrecht Dürer and Augustin Hirschvogel.[721] Camillo Procaccini's etching of the *Transfiguration* (1587–1590) shows the ethereal appearance of Christ in otherwise linear surroundings (Fig. 187), a similar effect to that represented in engraving by Raphael Sadeler I some five years earlier (see also Fig. 165).[722]

Simon Frisius practised a more earthly concept in his etching of an *Ecce homo* (c.1600), by completely dotting the skin of Christ as well as a soldier, creating highlights, shadows and reflections.[723] With this print he joined a group of other Netherlandish engravers and etchers who went beyond the linear character of prints, rendering tones by using dots, scribbles and other methods to create sculptural effects and colour values.[724]

Stippling to render volumes and particular surface textures remained part of the etcher's repertoire, and was popular in Germany for rendering the faces in portraits in the eighteenth century. The (completely) dotted print became a speciality of English engravers, led by Italian Francesco Bartolozzi, and flourished in the latter part of the eighteenth century until well into the nineteenth century. The main design was set up by stippling with the etching needle (visible as round or oval dots) and the image finished with the burin (visible as triangular dots).[725]

Aquatint
If mezzotint is the tonal version of engraving, 'aquatint' brings tone to etching, the main difference being that mezzotint developed into a pure printmaking technique and was used only later for reproduction purposes whereas aquatint was aimed at reproduction from the beginning. Different aquatint techniques were promulgated in England, France, Germany and Holland almost simultaneously in the eighteenth century. They reflect the fashion of the period for drawings and watercolours, and their intention was to reproduce washed drawings, and watercolours.[726]

The term 'aquatint', first used but not defined by Paul Sandby in the 1770s, denoted a tonal etching technique. His contemporaries also found it difficult to agree on what exactly was intended by the term; 'direct etching' they consid-

ered a form of aquatint at times. When talking about aquatint nowadays commonly 'dust-grain aquatint' is meant.[727] Consequently the use of the term 'aquatint' does not elucidate the process used.

The present text differentiates between controlled and uncontrolled forms of tonal etching. The latter form does not use any intermediary kind of resist and is grouped under the heading 'direct etching'. With controlled forms the etcher can produce degrees of tone from the palest hue to the deepest black, or its equivalent in colour. The various methods can be further divided into two types according to the processes used and, therefore, the appearance of the print. The first type permeates closed grounds and shows up as black textures in white while the second comprises deposited grounds that result in white textures surrounded by black.

Direct etching

It is tempting – and every beginner in printmaking will try it at least once – to scrape away or just leave uncovered a larger surface of a copper or zinc plate and expose it to acid. Or, more dramatic, a student may pour some nitric acid on the bare metal to see what happens. The acid will react strongly at first and the student will look forward to seeing the most gorgeous textures appearing in print. Sadly, however, not much happens. After a short while the acid is exhausted, stops corroding the metal and the print shows little more than a vague grey stain. It is, however, a feasible way of working, called 'direct etching' in English.[728] The effect on copper or zinc is weak, the metals are merely dulled, and the superficial textures are fine and wear quickly. The first impressions may look dark, but the metal has to be retouched every ten impressions or so. When parts of the etching ground are scraped away and the plate is bitten longer, a noticeable crevice forms and ink will be retained behind the edges (Fig. 188).

The effect of direct etching is stronger with iron or aluminium because the texture of the corroded surface of these metals is coarser and will hold a lot of ink, printing greys to deep blacks (or colours) depending on exposure time.[729] The modern expression is that these metals are 'self-aquatinting'. The texture in iron will endure longer in printing, too, because the metal is hard.[730] Daniel Hopfer made use of these effects to create dark backgrounds for decorations, portraits and texts in his iron etchings of the 1520s.[731] A variation of this technique, he was also the first to create different tones by means of etching.

Despite the limited effects and faster wear, etchers continued in their attempts to create tones in copper plates using direct etching. Parmigianino, for example, used it in some parts of an *Adoration of the Shepherds* (c.1527).[732] A specific form of direct etching is found in a *Mocking of Christ* (c.1640) by Pieter Franz. de Grebber (Fig. 188).[733] Outlines and hatching were drawn with a needle, the plate bitten and cleaned. Next the figures and the spiked nimbus radiating from Christ's head were covered with stopping-out varnish and the bare metal of the background was bitten away.

Parmigianino and De Grebber worked on copper, but Gerhardt Janssen etched a series of six mythological subjects on iron plates between 1717 and 1722.[734] He painted the figures in outlines on the plates with liquid ground or stopping-out varnish, into which he drew details with a needle. The lines and all the background are bitten, the prints showing white figures in a dark background, the coarsely bitten surface of the iron plate holding enough ink to print well (Fig. 189).

Brushing acid on the bare plate persevered: Bylaert (1772) removed part of his etching ground and directly applied acid to the copper to produce a tone;[735] Stapart (1773) did the same, but went a step further by creating two or three of the lightest tones of his aquatint in this way;[736] Sandby (1775) experimented with various tonal etching techniques, including brushing acid on brass and iron, until coming up with his liquid-grain aquatint process;[737] and Tischbein (1790) touched his already aquatinted plates with some acid to strengthen the shades.[738] A silver nitrate solution may be used to obtain the lightest tints – this solution, when left on the bare copper, replaces the copper, leaving the silver as a precipitate on the surface to hold some ink in printing.[739] Preissig (1909) stained copper plates lightly with a solution of sodium carbonate, ammonium chloride, or copper acetate in vinegar. The staining wears off quickly and the plate has to be steelfaced before printing.[740] Steelfacing protects the finer textures and resolves the problem of wear.

Spit bite

There is one technique for which the direct application of acid is well suited. The plate is covered with a fine-grained aquatint ground and the acid applied to the plate with a brush. In the hands of a skilful etcher the effect resembles a watercolour painting because of the flow of the acid. In a variation of this technique, called 'spit biting' in English, a ring of saliva is drawn and some acid dropped in the middle; the acid is diluted where it mingles with the saliva, showing in the prints as a dark spot fading at the edges.[741] Mixed with a starch or gum solution, the acid stays put where it is brushed on the plate instead of running off, allowing for interesting staining effects.[742] The technique is first described by Querfurt (1792) who used syrup as a gel.[743]

Sulphur tint

Related to open bite is 'sulphur tint'. Sulphur is mixed with olive oil and when applied to copper it pickles the metal, resulting in an even grey tone with fine darker dots.[744] The technique was supposedly invented by Johann Adam

Schweikart in 1745 during his stay in Florence and was used from the late 1750s onwards by a school of etchers around Andrea Scacciati for reproducing pen drawings with ink washes.[745] The technique has two variations: (1) the copper plate is rubbed with oil, dusted with sulphur powder and left to stand; (2) oil and sulphur are mixed and the paste is painted on the copper plate where tone is required.[746]

From the publishing dates of the manuals with prescriptions for sulphur tint, it can be deduced that the technique was known in England from the end of the eighteenth century, information spreading further in the nineteenth century. The earliest reference is by J.H. Green (1804) who mentions that 'this is a recent discovery, and known but to few, who wish to keep it a profound secret'.[747]

Semi-resistant grounds

When sulphur tint became more well known it was suggested that it may also have been used in earlier periods. Rovinskij (1890) recorded that Rembrandt had corroded some plates with sulphur (*teinté à la fleur de soufre*) without further arguments.[748] Ivins (1943) echoed him in stating that 'Dutch etchers' (meaning Rembrandt) used sulphur tint 'or some other chemical' to etch tones in their plates locally.[749] Tonal effects can be observed in several of Rembrandt's etchings but sulphur was not used. The etching ground was of uneven thickness and the thinner parts started breaking down in the acid, resulting in foul biting visible as series of fine punctures. The white, unetched parts show where stopping-out varnish has been brushed on the plate before etching in those areas where the ground looked thin. This phenomenon can also be seen in prints from Rembrandt's contemporaries, in particular in etchings by Van Dyck (see the lower margin of Fig. 117).[750]

Transfer process

The first type of transfer process forms a sort of extension of dotting with an etching needle. Instead of perforating the ground dot by dot manually, the etcher uses mechanical means to perforate all the ground, or selected parts, in one fell swoop. This saves time and, when carried out skilfully, gives a more homogeneous and natural result than dotting.

Cornelis Ploos van Amstel Cz., a wood agent and an art collector who also excelled at drawing, invented a technique suitable for both tonal and crayon etching in 1756. He instructed professional engravers who then produced a series of nearly perfect facsimiles of seventeenth-century drawings in their original colours.[751] He published 67 prints in his style and his son-in-law Christiaan Josi Jr. extended this number to 118.[752]

Ploos developed his own way of reproducing crayon drawings (see Fig. 293, p. 364), but later applied it to create tones, too (Fig. 190). He published reproductions of international repute of crayon as well as watercolour drawings, referring to them as 'print-drawings' (*prenttekeningen*).[753] This method would be described as a 'transfer process' in modern parlance because the design was traced onto and through the etching ground. After Ploos stopped production the process disseminated to be used by Dutch etchers only – for non-reproductive prints and book illustrations as well – until the 1830s. Ploos never described or published the technique and it was not known to his contemporaries;[754] he even swore his staff to secrecy.[755] Only one general description appeared shortly before his death, in Arend Fokke's manual of 1796, but without reference to Ploos or his works.[756]

Ploos's archives contain proofs of the tests he made and some notes, but not the full details.[757] The notes he left, remarks in some letters and the description by Fokke provide evidence that he had been experimenting by gluing various hard granular materials, such as finely crushed potsherds and gun powder, with gum arabic to a transfer drawing made for the purpose thereby creating a kind of sandpaper. This he placed on a conventionally ground copper plate, and traced the lines and tones. The ground was perforated in this manner, the paper removed and the plate etched. After etching, the plate's surface needed a lot of scraping and polishing to create tonal values, but the final effects were convincing.[758] Under magnification, lines and tones look like coarse gravel (dark dots on a light background). These typical marks make it relatively easy to discern Dutch prints made using the transfer technique from prints made with aquatint processes used elsewhere in Europe.

Unaware of Ploos's activities, Johann Heinrich Tischbein invented his own transfer technique, which he published circa 1790.[759] Instead of gluing a hard powder to a paper, he covered the etching ground with a layer of sand filed from a sandstone, pressed it into the ground by drawing on the sheet of paper on top of it and next etched the plate.

A century later, Alphonse Legros, similarly, placed real sandpaper on a plate covered with etching ground, ran the whole through the press a few times and perforated the complete ground with a multitude of tiny holes. Covering part by part with stopping-out varnish, the plate was etched in stages to create the different tones.[760]

Ploos van Amstel's method was refined almost to the point of perfection by Marius Holleman (1927). Originally trained as a chemist, Holleman devised extremely thin grounds that were penetrated by the smallest crayon and charcoal particles, a process that does indeed give the impression of dusty charcoal drawings (see Fig. 201).[761]

Salt-grain aquatint

Salt is used to perforate a common etching ground in 'salt-grain aquatint'. The salt is spread over the ground, the

plate heated and the salt sinks into the ground. After cooling the plate is rinsed in tepid water and the salt dissolves, leaving a finely punctured ground. The highlights of the design are painted onto the ground with stopping-out varnish, the plate etched, the lightest greys stopped-out, and so on until all tones needed are etched and the plate is ready. Under magnification, tones made in this way look like dark pits in a light background.

Salt-grain aquatint was used in France in 1766 for the first series of prints in aquatint by Jean-Claude de Saint Non that show typical tones built up of grey dots of different hues.[762] The process was described by François Stapart in 1773.[763] Stapart boiled sea salt in water until all the water had evaporated, ground it and sieved the salt in three grain sizes. In a minor development of this process, Johann Tischbein (1790) and Tobias Querfurt (1792) chose tartaric acid.[764]

Salt-grain was also known in Holland at the time but probably never used.[765] Paul Schwarz (1805) found the technique, as described in the German translation of Sandrart's treatise, too uncertain and too time consuming; he chose Le Prince's dust-grain process instead.[766] Salt-grain, or alternatively the use of sugar, is occasionally found nowadays as a replacement for dust-grain aquatint as it has fewer toxic effects.[767]

Dust-grain aquatint

In the 'dust-grain aquatint' process, powdered resin or asphaltum powder is dusted onto the plate by means of a small handheld box or a cloth bag containing the powder. For larger plates and more homogeneous coverage by particles, larger dustboxes are constructed (see below). When the resin powder has completely covered the plate it is heated carefully. The powder melts to form globules that sit on the plate and harden after cooling. Every globule is acid-resistant, the acid biting the metal around the plate. If heated briefly the globules are easily brushed off; if heated too long the globules spread further to coagulate to a closed layer, which the acid cannot penetrate. Dust-grain looks like white dots against a dark background, the ink printing from the area around the dots (Fig. 191).

Dutchman Jan van de Velde IV made the first dust-grain aquatints when working at the Swedish court from 1651 to 1654. As mentioned above, during this period he produced a portrait of Queen Christina in such a peculiar manner that, by comparison with later aquatint techniques, can be nothing else but dust-grain aquatint (Fig. 192). A few years later, when in Amsterdam, Van de Velde made three more portraits using the same technique.[768]

This remained an isolated attempt until the dust-grain aquatint process proper was developed by French engraver Jean Baptiste Le Prince from 1768 onwards.[769] Le Prince's new works met with enthusiasm when first shown in 1768. They answered the demand of his European contemporaries for reproductions of washed drawings, surpassing competitors to such a perfection that even the most versatile artists might be mistaken in discerning between original and reproduction.[770] Evidently, he was keen not to reveal any details about his invention. The editors of the *Mercure de France* (1771) hoped that Le Prince's technique for imitating drawings (printed in brown to enhance their reproductive qualities) would become known publicly so that drawings – hidden in cabinets and inaccessible to the amateur illustrator or pupils wishing to study them – could be reproduced.[771]

This desire was expressed even more emphatically in a later article in the *Mercure de France* of 1780. The editors once more discussed Le Prince's aquatint process, considering how wonderful it would be to acquire *dessins estampés* of all the exhibited pieces at every *Sallon*.[772] Despite his attempts at secrecy, information trickled out, disseminating to England and Germany. In a final effort to gain financially, Le Prince first offered his secret to the Académie des Sciences. When this failed, he published a prospectus for the sale of 30–40 prints in his process with a treatise describing the technique in 1780. Sadly nothing came of this as Le Prince died a year later.[773] The Académie bought the manuscript with the technical description from his niece, his sole heir, on 26 January 1782, broke the seals on 23 February 1782, disseminated copies of the text and finally the instructions were published in 1791.[774]

Le Prince's process concerned drawing on the etching ground with a kind of solvent based on olive oil. The dissolved ground was brushed off, laying bare the plate where the drawing was made. A sugar solution was brushed on the bare copper and powdered resin sprinkled over the plate, where it stuck to the sugar. The plate was turned over, knocked at the back to remove the surplus resin, after which the remaining resin was melted to the plate.[775]

Dissemination of dust-grain aquatint

Although dust-grain aquatint was developed in France it never gained popularity there at the time. French engravers, following Janinet instead, specialised in working the copper with roulettes and a large variety of other instruments. Dust-grain aquatint was used only on a larger scale in Germany, starting in Nürnberg from 1775 by the Prestels and their circle.[776] Any connection with Le Prince is unknown, although as Paris was an international centre for the arts and attracted many foreign artists, there were ample opportunities for the exchange of information.[777] Another possible route to Germany may have been through Peter Perez Burdett. This Englishman made some (dust-grain) aquatints from 1771 onwards, further studying and experimenting with French aquatints.[778] Pursued by his creditors, Burdett emigrated to Germany three years later, never to return to England.

Paul Schwarz trained with the aquatinter, Johann Gottlieb Prestel, who did not want to reveal the secret of the aquatint process however.[779] Schwarz tried Stapart's salt-grain technique, but found it too 'unsure' and time-

consuming.[780] Then, for a high price, he and some Swiss friends acquired a copy of Le Prince's original manuscript. Only after reading Le Prince's detailed exposition did he succeed in making a good dust-grain aquatint.[781]

Schwarz (1805) explains the dust-grain process in detail, describing and illustrating the use of a dustbox.[782] He speaks of *meine Staubmaschine* and would have contrived it himself, but Johann Meynier had already published information on his dustbox a year before (Figs 193 and 194).[783] Both machines worked according to different mechanisms therefore the authors would not have been aware of each other's invention. Meynier describes how to operate his dustbox: the box remains stationary and a piece of cardboard inside is moved up and down to create a cloud of resin powder. After he had a prototype made, he discovered that many artists working with aquatint also used such boxes, but he never saw one. Schwarz operated his box by turning it around an axis to produce a cloud of resin powder. Both systems are still in use today: the larger boxes have fans or scoops inside that toss up the resin powder, smaller boxes turn around a horizontal axis. In modern apparatus, air is also swirled around the inside of the box using bellows or an air pump.[784]

Dust-grain aquatint was known in England in the later eighteenth century, although it was not much used and only occasionally mentioned in English manuals, dotting and liquid-grain aquatint being preferred.[785] Typically, Green gives a recipe for dust-grain aquatint by 'Madame Prestel', Johann Prestel's wife and former business partner Maria, who moved to London after their divorce to set up a successful printmaking studio.

Le Prince's original technique was further developed by his followers. Dissolving parts of an initial etching ground is omitted and no sugar is used: resin powder is dusted straight onto the plate, and the plate heated until the powder starts to melt and coagulates to little drops. Next the tones are made by covering with stopping-out varnish and biting repeatedly until the desired effect is achieved. This is still how a dust-grain aquatint plate is prepared.

Liquid-grain aquatint

In 'liquid-grain aquatint', resin or asphaltum is dissolved in a solution of alcohol of between 70 and 85%. The solution is poured over the plate and left to evaporate; no heating is needed as the resin sticks to the plate. In the course of evaporation the alcohol forms a thin lacquer-like film, which then starts to crack due to surface tension. If the percentage of alcohol is too low the resin does not dissolve completely; if too high it evaporates too quickly when the solution is applied, forming an uneven layer. If the solution is too concentrated no cracking will occur and a closed acid-resistant layer forms. In its most typical form, liquid-grain resembles cracked dried mud (dark lines), the ink printing from the cracks around the unetched parts (Fig. 195).

As previously mentioned, Peter Perez Burdett made an intelligent guess about what the French were doing, experimented further and developed his own version of dust-grain aquatint. Heavily in debt, he sold his prescription to Charles Francis Greville who in his turn communicated it to Paul Sandby who set to work and came up with a new and unique way of creating tonal etching effects by about 1774.[786] He did not publish the liquid-grain aquatint process, but passed on his secret to other English engravers selectively.[787] More than 20 years later, Sandby's process was briefly mentioned for the first time in the *Compendium of Colors* (1797).[788]

Partington (1826) commented on the aesthetics of aquatint in general: 'A grain is thus produced with the greatest ease, which is extremely regular and beautiful, and much superior for most purposes, to that produced by the former method.'[789] But despite these advantages: 'It seems to be adapted chiefly for imitation of sketches, washed drawings, and slight subjects; but does not appear to be at all calculated to produce prints from finished pictures, as it is not susceptible of that accuracy in the balance of tints necessary for this purpose. Nor does it appear to be suitable for book-plates, as it does not print a sufficient number of impressions.'[790] 'The principal disadvantages of this method of aqua-tinting, are, that it is extremely difficult, to produce the required degree of coarseness or fineness in the grain, and that plates so engraved, do not print many impressions before they are worn out. It is therefore now very seldom used, though it is occasionally of service'.[791]

Many English aquatint plates had been produced by then and Partington had plenty of material from which to judge. His comments, however, date from the time that steel engraving had just started to spread its wings.[792] Different ideas on printmaking had emerged, and the new materials and techniques were capable of overcoming any criticism he may have made about the older techniques. Steel engravers created tones by densely hatching the plate with parallel lines using a ruling machine and biting in stages, which proved a secure working method.

Aquatint on steel is seldom mentioned and the number of steel engravings with aquatint is minimal.[793] An exception is the *Excursions daguerriennes*, a series of etchings on steel made after daguerreotypes and published in instalments between 1841 and 1844.[794] The plates have tones made with liquid-grain aquatint and as the *avis* reads: 'aquatint is chosen because it resembles nature closest and steel because it unites delicacy with solidity'.[795] In other words, steel allows fine aquatint textures to be etched on the one hand and to print a higher number of impressions on the other, overcoming Partington's complaint regarding print runs.

Dissemination of liquid-grain aquatint

Liquid-grain aquatint was used on the Continent only later. One example is the Dutch engraver and publisher Evert

Maaskamp, who was in contact with English publishers shortly after 1800 and who might have learned the process through them. Exceptional for a Dutch engraver, instead of Ploos's transfer technique he used the English liquid-grain aquatint process from around 1810. The title of a Dutch manuscript on liquid-grain aquatint from the same time, possibly from Maaskamp, refers to the English provenance of the process: 'Manner to engrave into copper in the English way, by them called "acqua tinta"'.[796] Other Dutch engravers gradually changed from the transfer process to liquid-grain aquatint after 1815,[797] further supporting the suggestion that Maaskamp learned the technique in England and passed the information on to other Dutch engravers.

Liquid-grain aquatint was known to Edgar Degas in 1880, who communicated it to other Impressionists.[798] Gradually the process was replaced in England by the dust-grain aquatint process, possibly because this was used in photogravure.[799] All manners of aquatint disappeared in the Netherlands after 1840 to make way for lithography and wood engraving. Dust-grain was used again by Dutch engraver Petrus Arendzen in the later 1880s;[800] in 1887 he was working in England, where he would have learned the technique.[801]

Sprayed aquatint
Sprayed aquatint – resin or bitumen dissolved in benzole or ether sprayed onto the plate – made its appearance at the end of the nineteenth century, 'The solution being contained in a bottle into the cork of which a scent spray is fixed', according to Herbert Denison (c.1895), who calls the technique 'promising' and considered its use for photogravure.[802] Spraying an aquatint ground by blowing liquid varnish through a vaporiser or, more contemporary, by a spraycan, was common in the second half of the twentieth century.[803] The appearance of a sprayed ground is much like dust-grain, with white dots against a dark background, but the density of the dots may be varied by spraying more or less ground locally. Vojtěch Preissig (1909) refined the technique by using an airbrush for the base layer.[804] A monograph on the use of an airbrush for sprayed aquatint was published by André Béguin (1975), who created the complete image in this manner.[805] Nowadays liquid acrylic grounds are sprayed as an alternative to dustgrain-aquatint.[806]

Lift-ground[807]
Paul Sandby developed a 'lift-ground' technique in combination with his liquid-grain aquatint. Lift-ground became well established and is still in use. The basic technique is as follows. Having etched the outlines of the drawing in the standard way, the etcher cleans the plate, thoroughly degreases its surface and applies an aquatint ground. The shades of the design are drawn on this, with a brush, with a water-soluble mixture of which ordinary sugar is usually the main component, although many recipes exist; other ingredients include soap, gum arabic, honey and chalk powder. The plate's surface is covered with stopping-out varnish or liquid etching ground and left to dry. The ground on top of the ink mixture will crack a little in drying and when the plate is soaked, water penetrates through the cracks, the water-soluble ink dissolves and lifts the ground on top of it from the plate. Thus the metal of the plate is exposed where the image has been drawn. Next the plate is etched, the acid corroding the plate only where the ground has been removed. Because of the aquatint layer, biting can be done in steps as with any other aquatint plate.[808]

A forerunner of lift-ground can be found in prints by Hercules Segers from the 1620s. He experimented with drawing with a brush and a kind of lifting solution on the plate (Figs 196 and 197).[809] Segers also reversed the technique, first covering the plate with his soluble matter, drawing into it with a needle to scratch it away, covering with a liquid ground and lifting everything but the drawn parts.

There were several different options, for example, dust-grain could be applied instead of liquid-grain; Segers etched his plates directly.[810] Thomas Gainsborough first painted all the outlines with the ink mixture, lifted the ground on top and etched the lines of his design, after which he proceeded to lift and etch the shades. John Hassell produced the first specimens of a variety invented by him in 1795, by which process he could produce both crayon lines and shades.[811] Hullmandel (1840) patented painting with a soluble mixture on a thinly greased – instead of a thoroughly degreased – plate to obtain special effects.[812] The reticulated textures thus obtained became popular in the second half of the twentieth century.

Dissemination of lift-ground
Lift-ground without using aquatint spread to the Continent before 1800, where it can be found in works by the Flemish artists Louis Bernard Coclers and his sister Marie Lambertine; in Holland it was used by Hermanus Fock. The technique appeared in France by the middle of the nineteenth century.[813] Maxime Lalanne was the first to publish the lift-ground process in 1866.[814] He prescribed how to make a drawing with plain India ink and pen on the plate, cover and lift it, and etch only once. No aquatint is applied and the ink is held by the texture in the bottom of the groove. The resulting etching resembles a pen-and-ink drawing.[815]

The lift-ground process gained a certain popularity with the Impressionists and artists after them, such as Camille Pissarro, who used it in 1880, and Käthe Kollwitz from 1903. French printer Roger Lacourière taught the process to Picasso and Stanley Hayter, following which lift-ground etching became a much-used intaglio technique in the twentieth century.[816] The technique is well suited to the artistic print because it allows free handling of a brush or pen on an

etching plate – just like drawing with ink on paper.

Choice of processes
Aquatint techniques disseminated to other countries in the decades following those in which they were invented. Summarising the above, Ploos van Amstel in Holland invented a transfer technique for the reproduction of crayon drawings in 1756, which also proved suitable for creating tones. A similar process was described in Germany some 30 years later, but was probably little used there. Several mechanical and chemical procedures for making tones were tried in France of which Stapart's salt-grain technique found some resonance, probably because he published it. More effective was Le Prince's dust-grain technique, which became known in England in 1771 when it was reinvented by Burdett. Sandby modified it to become a successful liquid-grain aquatint method possibly in 1774. Dust-grain also spread to Germany where it was the favoured professional working method from 1780.[817]

The differences in appearance of tonal intaglio techniques used make it easy to distinguish, under magnification, between the textures of (1) Dutch, (2) English, (3) French and (4) German prints produced with tonal etching processes in these countries before 1800:

(1)
lighter and darker dots against a light background = transfer process
(2)
dark aligned craquelures against a light background = liquid-grain aquatint
(3) darker dots against a greyish background = roulette manner
(4)
white dots against a dark background = dust-grain aquatint.

This is an oversimplification of historical and technical developments that does not do justice to all the many experiments and local processes, but it is useful to the study of tonal intaglio prints from the second half of the eighteenth century onwards.

The choice of aquatint processes used probably depended more on personal contacts than on printed information.[818] Dissemination of information about the various aquatint processes around 1800 is evidenced by only few authors. Spilsbury describes both the dust-grain and liquid-grain methods, as does Green.[819] Fokke describes the techniques of Ploos van Amstel and Stapart.[820] *The Compendium of Colors* mentions five kinds of aquatint.[821] Schwegman lists six kinds of aquatint techniques and refers to those by Le Prince and Ploos van Amstel although he does not know any details.[822]

Green was the first author to devote a monograph to aquatint. He lists 10 basic recipes and 14 mixtures for liquid-grain, 4 for dust-grain; he also knows sulphur tint.[823] He received heavy criticism of his publication, as he explains in the second edition (1804) of his manual: 'The Aquatinter has been alarmed for the reputation of his art, which appeared to depend upon its secrecy, difficulty, and monopoly.'[824] This elucidates once more why so few descriptions of the aquatint process were published up to then, contrasting with the extensive use of the technique by many English engravers. The situation eased and later in the nineteenth century, secrecy being less of an issue, copious instructions on the aquatint process appeared.

Crayon

Various forms of crayon etching were invented in the second half of the eighteenth century, typically to reproduce crayon drawings and concurrent to mechanical procedures with roulettes invented for the purpose.[825] As we have seen before, many techniques have their forerunners and crayon etching is no exception. In this case, we may look at some etchings by Marcello Fogolino (fl. 1519–1548). The lines of these prints have a granular character unlike the continuous lines drawn with an etching needle. Apparently this concerns a kind of transfer etching technique by which a fairly coarse kind of powder is pressed into the ground following the lines of the design. Next the plate is etched, the acid penetrating the ground where it is perforated by the powder, biting series of little pits into the plate (Fig. 198).[826]

This description is similar to the transfer process invented by Cornelis Ploos van Amstel in 1756. He brushed the back of a (transfer) drawing with gum arabic and dusted a hard granular powder onto it.[827] When the glue was dry, the paper was placed face up on a ground plate and the lines of the design traced with a blunt needle, the powder perforated the ground and the plate etched (see Fig. 190).[828] Jean-Charles François used a similar technique for the reproduction of black crayon etchings from 1757 onwards. Ploos van Amstel took it further, producing facsimiles of two-colour (red and black) crayon drawings to washed drawings and polychrome watercolours.[829]

In another technique, used by Johann Heinrich Tischbein (1790), the ground is dusted with sand, the drawing laid on top and the outlines traced. The powder is pushed into the ground perforating it and in etching, the acid bites

around the grains. Instead of sand Tischbein also used tartaric acid crystals, which dissolved in the acid bath.[830] Friedrich Netto (1840) describes how to draw directly on the etching ground with a mixture of *Rothsteinpulver* (haematite or red sandstone?), syrup and glue. The plate is placed on the bed of the press, covered with a sheet of paper and the whole run through the press. The powder is pressed into the ground, perforating it, the plate etched etc.[831]

Soft-ground etching
A totally different process for etching crayon lines – and one still in use today – is 'soft-ground etching'.[832] The plate is covered with a normal etching ground that is mixed with about an equal part of materials such as mutton fat, making a soft and sticky ground. A drawing is placed on the ground, the design is traced with a blunt needle and the sticky ground adheres to the verso of the sheet. When the paper is lifted it takes the ground with it where the drawing is traced and at these places the metal lays bare. The plate is etched as usual. The print shows lines that look as though they are drawn with a pencil or crayon, because it also reproduces the texture of the paper on which they are drawn. Compare this effect with Ploos's transfer technique in which the individual dots of the granular matter penetrating the etching ground can be distinguished, but not a paper structure.[833]

The first soft-ground print was published by Benjamin Green in 1771 (Fig. 199). How Green arrived at his invention is not known, but he had probably sought an easier and faster way to make a crayon engraving. Paul Sandby described the new technique in a letter to John Clerk of Eldin in 1775. In Sandby's description, the etching plate is heated and covered with normal etching ground after which tallow (dried animal fat) is mixed with the still warm ground on the plate; this shows that the process was not yet fully developed.[834] In later recipes, the soft-ground is applied ready prepared.[835]

The majority of early soft-ground etchings have no other intention than to look like crayon drawings. The technique also lends itself excellently and more easily than other methods to the reproduction of fine quality works. Apparently, its potential was recognised at the time but ignored in favour of more established techniques.[836] Portraits in the medium are rare.[837]

Soft-ground etching was popular in England for half a century around 1800.[838] The technique fitted the production of so-called 'drawing-books', model books used in the training of amateur and professional artists. It was most often used for landscapes and town views, and regularly combined with aquatint.[839]

Foreign use
The soft-ground technique was practised by some foreign artists, such as the Dutch engraver Hendrik Meijer, who used it for a set of 12 landscapes while working in London in 1792.[840] How the process came to France is unknown but one possibility is through Thomas Girtin, who went abroad for his health in 1801 but did not get further than Paris. He made sketches from his carriage and on his return home etched the outlines of his drawings in soft-ground.[841] We find soft-ground etchings in France from this period, when Michel Vauthier published a large set of landscapes using the technique.[842] The etchings of Louis-Philibert Debucourt often display a mixture of techniques, such as in *La Course* (1804) for which he used line etching and roulette together with soft-ground.[843]

Dutch military officer Ernst Willem Jan Bagelaar visited Paris while on leave in 1811. Retired in 1815, he spent the rest of his life studying the arts and published a treatise containing a paragraph on the technique of soft-ground etching, the earliest Dutch text on the process.[844] However, he never used it – the crayon prints he made are all done using Ploos van Amstel's transfer technique.

Scottish-born William Charles immigrated to the United States and drew anti-British satires during the Anglo-American war of 1812. Later he contributed two plates to Abraham Rees's *Cyclopaedia*.[845] Charles made plates 8 and 9 in volume 43 in soft-ground with some roulette work added to strengthen the weak parts. Both prints, befittingly, reproduce drawings illustrating Gaspar Poussin's item *Drawing* (see Fig. 63, p. 61). The prints are hand-coloured and are believed to be the first American soft-ground etchings.[846]

Decline and new popularity
Crayon-etching techniques gradually disappeared after 1825 as the newly introduced and upcoming lithography could do the same faster, simpler and cheaper. Thomas Shotter Boys's career illustrates this change. After some experiments with soft-ground in the early 1830s, he became a famous (colour) lithographer.[847] Fielding (1841) remarked about soft-ground: 'since the invention of lithography, however, it has been almost entirely abandoned, though for those who live too far from any town, where a lithographic press is established, it will be found a great source of amusement'.[848]

It is often assumed that soft-ground died out at this time but this is not the case. It is an easy technique that offers multiple possibilities and became popular with many artists both in England and on the Continent. French engravers produced soft-ground etchings from the late 1830s onwards and the technique was described in French manuals from the middle of the century.[849]

This change invited experimentation, the reproductive qualities of soft-ground making way for the artistic. Some

French prints from the mid-nineteenth century show fabric pressed into soft-ground to create tones comparable to aquatint.[850] When Félicien Rops started using soft-ground in the 1870s, he formulated his own method using several kinds of paper for one plate, and producing lines with different textures.[851] He also tried pressing objects into the ground, later called 'nature printing'.[852] Soft-ground can be directly scribbled into with a blunt stylus or any type of object such as fingernails or combs.[853]

Soft-ground gained in popularity. Encouraged by the technically knowledgeable Félix Bracquemond, French Impressionist artists experimented with the technique from the later 1870s onwards.[854] They were followed by members of the School of Pont-Aven around 1890.[855] Félicien Rops had his crayon drawings photomechanically transferred to intaglio plates.[856] However, his ordinary soft-ground (*vernis Fély*) was not suitable for reworking them so for this purpose he and his fellow countryman, Armand Rassenfosse, developed a new kind of ground. The final recipe, called *Ropsenfosse*, was perfected by 1892.[857] The recipe contains 1 part ox fat, 2 parts colophony resin and 4 parts white wax. Notably this mixture is dissolved in gasoline, making it a liquid soft-ground.

Rassenfosse experimented with the medium and around 1923 developed a technique whereby the problem of printing in mirror image was avoided. He drew on a smooth paper with a special ink, laid it on the plate immediately and ran it through the press. The drawing was offset on the plate, which he powdered with whiting or zinc oxide. The excess powder was removed and the plate covered with a very thin layer of varnish. The acid attacked the particles that stuck through the varnish and next the metal underneath each particle. In this way Rassenfosse obtained crayon-like lines.[858]

A late nineteenth-century development involved making a soft-ground print in more colours. Rassenfosse used one paper on several plates for this; by changing the paper from plate to plate he could draw any part in any colour.[859] Walter Ziegler described the same technique and called it *Zieglergraphie*. With this method, all plates are drawn and etched in soft-ground and the various colours are printed on top of each other.[860] The process was reinvented by the Paris printer Aldo Crommelynck for Pablo Picasso about 1970 although he never used it. Crommelynck explained the process to David Hockney in 1973, who used it regularly in the years following.[861]

Dissemination of information

To understand how information on the soft-ground process disseminated, we go first to the Netherlands. The Nederlandsche Etsclub was founded in 1885, following the example of the Societé des Aqua-fortistes and other etching clubs.[862] Teaching themselves etching with the help of manuals such as Lalanne's – etching was not part of the curriculum of the Rijksacademie in Amsterdam – the members occasionally practised soft-ground too.[863]

From Amsterdam there is a connection to Berlin. One of the founding members of the Nederlandsche Etsclub, Jan Veth, showed it to Max Liebermann when they met in Amsterdam in 1890.[864] Back in Berlin, Liebermann made soft-ground etchings from 1890 to 1892 and it was probably through him that it became known by the city's art scene. From then onwards the process is found in etchings by German, Austrian, Danish and Swiss artists.[865] The London and Paris metropoles with their art schools and ateliers attracted many artists from eastern Europe, Scandinavia, China and Japan, who took back current knowledge of graphic processes to their home countries.[866]

The first American publication in which a description of the soft-ground process can be found is Sylvester Rosa Koehler's translation (1880) of the second edition of Lalanne's manual.[867] American Leigh Hunt apparently did not know about this and he discovered the technique for himself in the 1880s when visiting August Delâtre's studio in Paris. There and then he bought 'a working outfit, now in the National Museum at Washington with a soft-ground etching executed by the President of the New York Etching Club'.[868]

Modern developments

Experimentation is a continuous process and etching in particular is attractive to the modern artist, opening up previously unforeseen possibilities . 'Playing' with materials and tools became of interest to artist-etchers in the second half of the nineteenth century and increasingly so after 1900. Not everyone was captivated by it, though, and some even opposed the graphic experiment. 'The *line* is the main thing to be depended upon', wrote the Dutch etcher Arend Hendriks in 1944.[869]

The separation of manual printmaking from the printing trade from the mid-nineteenth century is accentuated by individual methods of plate production. The interest in applying a variety of techniques with an artistic-creative aim can already be seen in Lalanne's manual of 1866 at the beginning of this period. Several of the techniques, however, only allow small print runs and suggest experiments that a professional engraver would never attempt because the results would be in doubt. He described and illustrated, for example, how the coarse structure of a landscape was made by tapping the warm copper plate in an irregular way with a dabber only partly charged with etching ground, which will give 'unexpected and happy results' (*des résultats inattendus et souvent heureux*).[870] In the same mode, he explained how to draw the lightning in the sky of the same plate with liquid varnish on top of the hatched clouds be-

fore biting (Fig. 200).

Frank Short (1888) showed a test plate with specimens of various techniques, one of which was foul biting through an irregular ground. Although a technical mistake (see Fig. 117), 'foul biting is often seen in etchings, and very often can be made of great use in suggesting tone'.[871] His contemporary Roller was not so happy about this *laissez-faire* attitude.[872] He expressed the differences when he commented that 'Lalanne paid little attention to theoretical issues, about the composition of the grounds failed every bit of useful information and regrounding the plate – indispensible for the professional etcher – he did not deem worthy of discussing.'

Koehler (1885) did mention aquatint and mezzotint, but did not give instructions: 'these processes are too complicated and laborious for the generality of etchers, and I shall not, therefore, stop to consider them in detail'.[873] Instead he explains how to press sandpaper into the etching ground, the direct etching of metal, and working on the plate with 'Scotch stone' – all tonal techniques with a short life in printing.

Experimentation escalated from around the turn of the century. Fraipoint appreciatively referred to an acquainted etcher (Georges Rouault?) who worked his plates with all kinds of odd tools.[874] Austrian Ludwig Rauscher disclosed his 'studio secrets' (*Ateliergeheimnisse*) to his daughter only. Long after his death in 1914 his notes were published, in which he described a form of aquatint technique based on the reaction of two chemicals on the metal plate, which creates an effect like a watercolour.[875]

Dutch chemist Marius Holleman, at the start of a promising career, suddenly turned to painting and printmaking. Loyal to his former profession, he applied his scientific knowledge to the development of grounds and etching techniques with great ingenuity. This would have been appreciated a century earlier but not around 1920 when he was active. His inventions did not find any successors even though a selection of his notes was published posthumously, illustrated with restrikes of his own plates.[876] Typical of one of his innovations is an etching ground thinner than a grain of charcoal powder. He had developed this ground in order to press charcoal drawings into it, the charcoal powder penetrating the ground and the plate etched. The effect was a copy of the original drawing (Fig. 201).

Atelier 17

In 1927, Joseph Hecht and Stanley William Hayter established the Atelier 17 in Paris, a centre for experimentation in intaglio printmaking. It differed from the other numerous Paris ateliers in that the concepts taught in this studio were based on Hayter's Surrealistic influences, combined with a sound practical basis. This created an environment open to experimentation that was both conceptual and practical (see Fig. 10, p. 9).[877]

Curiosity about alternative materials and techniques had already been expressed in the United States. Hayter's temporary move to the USA because of the Second World War therefore proved opportunistic to American printmakers and the establishment of his New York Studio 17 was greeted by an interested audience. This was immediately reflected in American manuals, such as those by Silsby (1943) and Sternberg (1949), describing experimental techniques.[878]

Hercules Segers's prints were rediscovered in the nineteenth century and – after Rembrandt – he became the next great motivation for etchers. Their interest in his experimental works could be seen in the first half of the twentieth century and was clearly apparent by the 1950s. Hayter published a new kind of printmaking manual in 1949 encompassing not only chapters on technique, but also a survey into the history of printmaking and a discussion on concepts in the graphic media. He mentions five forerunners – he calls them 'freaks' – of the modern etching revival, with Segers taking pride of place.[879]

With this foundation in mind Hayter calls on artists to experiment.[880] In the third edition (1981) of his manual he made clear where his intentions differed from those of other authors: 'Since [the first edition of] this book has been in print, a multitude of printmaking manuals have appeared, many of which are in the domain of "do it yourself", giving simple instructions to hobbyists. The factual information in such books describes effectively all conceivable operations intended to produce a printed sheet but frequently divorces the technique from the thought involved. Such books demonstrate the action of the artist upon the plate but ignore the reciprocal action of the emerging image upon the thinking of the artist ... Our thesis is that unless some vital matter should arise during the operation, the whole business is counterproductive ... Briefly, the interdependence of technique and idea is a condition without which idea is lost and technique is a sterile, mechanical operation.'[881]

Looking back over the 40 years during which Hayter implemented his ideas in the printmaking world, his former student Gabor Peterdi (1973) observed that print formats had grown steadily and plates had become more 'sculptural'. The use of colour had expanded considerably in the last 25 years.[882] Leonard Edmonson considered the future of printmaking in the same year. He foresaw that 'the non-traditional etcher searches for technical freedom by exploring new processes and combining etching with the non-printmaking media of painting and sculpture'.[883] Edmonson proved to be right, and developments went even further with the introduction of digital processes and the concept of installations in printmaking.

Etching grounds

Bosse's manual was popular with 20 editions in six languages, published in the space of 150 years, because it was the first monograph of its kind and encompassed everything a professional engraver should know. The certain unrestricted way that Lalanne presented etching techniques is the reason why his book also became so popular, with 17 editions in French and English being published from 1866 to 1926. Lalanne's manual heralded the new age of the artist-etcher, where precision in technical performance was second to artistic performance, and where experiment and special processes went hand in hand with the work's concept.

A professional engraver, such as Bosse, would have done his best to prevent the ground being penetrated by the acid. Grounds breaking through with subsequent foul biting of the plate were a constant worry to him, while on the contrary semi-resistant grounds became more and more appreciated by the artist-etcher, as mentioned above.

Experimenting with known as well as ephemeral materials increased at the beginning of the twentieth century. Vojtěch Preissig (1909) proposed oil paint as semi-resistant ground.[884] Independently from each other, Walter Ziegler in the early twentieth century and Frank Nankivell in the 1920s drew with oil crayon on dust-grain aquatint; the plate was etched and a white crayon line shows in the print.[885] Interest in semi-resistant etching grounds developed further in the 1970s. Frank Cassara, working under Rackham Grant, invented a 'soap ground',[886] a mixture of raw linseed oil, titanium white, soap powder and water. It is brushed onto the plate in an expressive manner to create illusionistic effects, the ground succumbing to the acid in an irregular way.[887]

Towards the end of the twentieth century, safer materials and procedures in printmaking were given a high priority. For example, from the 1990s onwards, it became customary to protect the back of the plate with plastic tape or sticky foil, instead of stopping-out varnish.[888] The plastic is pulled off again when the plate is ready for printing, which reduces the amount of solvent otherwise needed for cleaning off the varnish. Cedric Green recommended oil-based printing ink as an alternative to toxic liquid etching ground and to soft-ground.[889] Acrylic-based printing inks were also used as etching grounds.[890] Genuinely new types of ground based on acrylics were first developed by Mark Zaffron and have been marketed since the middle of the 1990s.[891] Presently a range of acrylic grounds for different purposes, such as for hard ground, soft-ground varnish and stopping-out varnish are offered.[892]

Etchants/mordants

Zinc can be etched in a solution of copper sulphate only in water, a process found occasionally from the earlier twentieth century onwards.[893] The chemical reaction is calm and stable, the temperature of the bath does not increase during biting and unlike nitric acid no toxic gases are given off.

Although from a chemical aspect this method is basic and straightforward it took until the late 1990s before interest in etching with solutions of salts was reignited. Printmakers were looking for alternatives to nitric acid, Dutch mordant and ferric chloride for health and safety reasons. Cedric Green published information on etching zinc with a copper sulphate solution in 1998,[894] which he called 'Bordeaux Etch', because copper sulphate is commonly used to treat mildew in vineyards and is known as Bordeaux mixture (*Bouillie Bordelaise*). Nik Semenoff described the etching of aluminium with a solution of copper sulphate and kitchen salt with some sodium bisulphate in water in the same year.[895]

Zinc is the metal most commonly used for etching in western Europe, where Green is working, and it reacts immediately with copper sulphate. Semenoff is based in Canada where aluminium is far cheaper than zinc. In cooperation with a chemist, L.W. Bader, he therefore developed etching aluminium.[896] The printmaking department of the Gerrit Rietveld Art Academy in Amsterdam followed Green's instructions and changed from etching with nitric acid to etching with copper sulphate early in 1999.[897] Due to intensive posting on the MTSU Printmaking Links discussion list in the years following, etching with copper sulphate was widely adopted and further developed.[898]

As demonstrated above, the etching of iron and (mild) steel with a solution of copper sulphate and a chlorine-containing salt was recorded from the fifteenth until the nineteenth century.[899] Friedhard Kiekeben revived the process at the beginning of the twenty-first century, calling it 'Saline (Sulfate) Etch'.[900]

More recently, a cupric chloride solution in water, with sodium bisulphate and hydrogen peroxide added, is (again) recommended as an etchant for aluminium, zinc and iron.[901] The element copper is higher on the voltaic scale than these three metals, which allows for an electrolytic reaction. The chlorine ions are needed to propel the reaction with aluminium and iron; neither the sulphate nor the sodium ions are active therefore the same process takes place when a solution of cupric chloride is used, instead of a mixture of copper sulphate and sodium chloride (kitchen salt). A solution of cupric chloride has the same active copper and chlorine ions as a solution of copper sulphate and kitchen salt.

Electrolytic etching

The last decade of the twentieth century saw a revival of interest in electrolytic etching because of its safe handling. Nik Semenoff and Christine Christos in Canada, and Marion and Omri Behr in the United States, published simultaneously in 1991.[902] The Behrs patented their methods of electrolytic etching, claiming that their varieties were original and never before invented.[903] Englishman Cedric Green (1998) opposed the patent, considering that there was nothing original about it given the history of the technique.[904] This caused a series of polemics on the subject by the end of

Photomechanical techniques
Photography applied to etching, so condemned by the artist-etchers of the later nineteenth century, revived as an artist's technique from the mid-1960s to the extent that it was found 'an increasingly important feature of the contemporary print' and 'a major means of expression'.[907] Presently photogravure is enjoying a modest popularity (Fig. 202).[908] In the traditional manner, the asphaltum powder is first melted to the copper plate. A paper tissue covered with a gelatin layer is sensitised by means of a bath of potassium bichromate and a film positive of the size of the final print is placed on top of it. After exposure to a light source, the exposed parts of the gelatin layer are hardened. The gelatin is attached to the plate, the paper tissue removed in a water bath and the copper is etched by means of a series of ferric chloride baths of various strengths.[909] The basic methods are still the same but computer imaging software has been a welcome addition to the traditional techniques for creating pictures. Stochastic (random dot) screens have replaced the more difficult to apply and toxic asphaltum dust-grain aquatint.

A more manual technique involves making a Xerox copy and offsetting the image onto the printing plate by either soaking the sheet from the back with a solvent or melting the resin containing toner onto the plate.[910] The toner sticks to the plate, which can be further treated as any other etching. Alternatively, prepare the Xerox copy as a lithographic plate, apply printing ink to its surface and offset the ink onto the plate. Then there are two options: (1) cover the plate with a thin layer of shellac varnish and rub the dried shellac layer with white spirit to remove the ink parts (the shellac reticulates on top of the fatty ink and the solvent penetrates through the cracks); (2) use the ink as an acid resist by allowing it to dry (Fig. 203).[911] The effect can be enhanced by dusting fine resin or asphaltum powder onto the still wet ink.[912] The powder is carefully brushed against and into the ink, the plate turned over to remove the surplus, and heated from the back to melt the powder to the plate. In yet another variation the Xerox copy is placed on the plate and the back of the paper is ironed using a hot flat-iron until all the toner sticks to the plate; the plate is immersed in water and the paper peeled off, leaving the toner image; the plate can then be etched.[913]

Working in a studio with a variety of printmaking equipment available allows screenprinting photographic imagery on etching plates. Squeezing liquid etching ground or acrylic resist through a screen on top of a blank etching plate is a means of creating a base for photomechanical etchings.[914]

Solarplate and photopolymer film
Flexography plates covered with light-sensitive polymer layers that could be washed out with water were available to the printing industry from the 1970s when American Dan Welden started experimenting with these kinds of plates for use in intaglio printing. He introduced them into Australia in 1992 where the term 'solarplates' was coined (see Fig. 8, p. 8).[915] Simultaneously, Danish printmaker Eli Ponsaing started working with another type of photopolymer plate.[916] Both types can be printed as an etching, but also as a lithograph because the silicon layer repels the oil-based ink. Photopolymers do not produce toxic vapours but gloves should be worn when handling the materials under water as they contain reactive chemicals. Additional textures can be achieved by scratching and gouging lines into these plates.[917]

In the early 1990s photographer Keith Howard, in his quest for safer materials, experimented with a variation of the photogravure process in which a photosensitive gelatin emulsion was applied directly to the copper plate and processed.[918] In a further step he did not etch the plate, but printed the relief of the layer in intaglio, developed this idea further and changed to a type of photopolymer film.[919] The film is laminated to the surface of a copper or zinc plate with some water, exposed, and the non-hardened parts are washed out. The film stays on the plate and can be printed in relief or intaglio. At the same time, Mark Zaffron was experimenting with light-sensitive photopolymer films used in the production of computer chips in 1993. His films were attached to the plate by heat. Both used 'Riston' films that were still moderately toxic.[920]

Howard and Zaffron made contact with each other immediately after in 1994. Zaffron explained his light-sensitive polymer films and Howard began experimenting with them. The first type he used called 'ImageOn' was still toxic – later thinner and more sensitive foils were developed, and within two years photopolymer films had found their way to printmakers.[921] Basically, impressions from these films are reproductions of the negatives or positives with which they are produced. But it is also possible to work directly into the film with a solution of washing soda, which allows for manual intervention. Further etching of the metal support is possible if the metal is laid bare or the film scratched through.[922] Polymer films are often used nowadays as they allow the printmaker to transfer his sketches and photographs to print easily and the process accords well with digital image making.

Non-manual Procedures

It is not appropriate within the context of this study to discuss non-manual procedures in great detail. However, the subject needs an introduction here for several reasons:

1.
    Non-manual processes developed from manual techniques.
2.
    They are often combined with manual techniques, both in the past and nowadays.
3.
    They drove many artists from the nineteenth century on to concentrate on manual techniques to achieve specific effects.
4.
    Artist-etchers of later generations took a more creative approach towards non-manual procedures.
5.
    They stimulated discussion on the difference between original and reproduction in the graphic arts.
6.
    With nearly all processes the inking, wiping and printing is still done by hand – mechanisation in intaglio printing is limited.
7.
    Electrotyping cannot be viewed as separate from electrolytic etching, steelfacing and increasing the print runs of manually produced plates.
8.
    Both the earlier rejection of non-manual processes as well as their later introduction in modern printmaking resulted in the creation of prints of a character different from their predecessors.

Despite many nineteenth and early twentieth-century publications on non-manual graphic techniques then developed and applied, any extensive studies on the subject are lacking.[923] Their relationship to the study of art history in general, or of the influence of non-manual procedures on the development of (artistic) printmaking in particular, are only rarely discussed. Such points of view are still open to research.[924]

One hurdle that is difficult to overcome for novice students of this subject is the complicated terminology used for the non-manual methods. With every new invention a new name or term is introduced, both with mechanical and photomechanical processes in the nineteenth century and with digital techniques in the twentieth and early twenty-first century. Different processes are known by the same (or almost the same) name, while the term used to describe the same process may change depending on the time and place. Terms may barely embrace the technical content of the process and may require further definition. Knowledge of physics, chemistry and printmaking techniques is requisite to understand the processes, as well as their technical and historical developments.[925] Some further practical experience is useful to support a better understanding of the techniques, their appearance and possibilities.

Replication of intaglio printing plates

The need for longer runs than one plate could reasonably print prompted engravers to search for techniques to reproduce either the original design or the matrix. The first can be achieved by repeating the drawn design on as many as plates as needed, or offsetting an impression of the first plate onto a second, a third and so on. The design will differ slightly between the plates, but in the hands of a capable engraver the results will be close.[926] The nineteenth-century engineer tried mechanical ways to solve the problem for which three methods were developed: casting, impressing and electrotyping.

Casting
One idea was to copy a printing plate by making a cast of it. Replication of printing plates was already being carried out in the fifteenth and sixteenth centuries, such as plates made for pasteprints and casts of woodblocks.[927] From the seventeenth century emerged 'stereotypes', copies of set typographic printing forms.[928] Casting intaglio plates was carried out only after 1800 but the process was not very successful, however, as the textures of etched and engraved plates are much finer than those of woodcuts or type.[929]

Impressing
An intaglio plate can also be reproduced by impressing the design of one small engraved plate of, say, 2 × 3cm (indirectly) into another plate. Jacob Perkins invented a technique whereby a soft steel roll is passed to and fro over a hardened engraved steel printing plate until the design is impressed in the roll. Next the roll is hardened, passed over a second soft steel plate until the design is impressed into it and the plate hardened to create the actual printing

plate. This technique is used for duplicating the design of a stamp to the format of a full sheet.[930] Only one design needs to be engraved and the indented roll can be impressed a number of times into another plate until there are enough images to print a full sheet.[931] Replicating any design larger than a postage stamp in this manner was technically impossible.

A specific case is the reproduction of natural objects as, or in, intaglio printing plates. A first attempt was carried out by Danish goldsmith Peter Kyhl in 1833, who pressed feathers and fish scales in metal plates; others were working on similar processes. In England, France and in Austria in particular, techniques were invented for printing sections of meteorites, semi-precious stones and fossils.[932]

The most successful method was invented by Andreas Worring and Alois Auer, respectively workshop manager and director of the k. und k. Hof- und Staatsdruckerei in Vienna.[933] The process was called 'nature printing' (*Naturselbstdruck*) by Auer.[934] A flat object, such as a leaf, is placed on a steel plate, covered with a soft lead plate and considerable pressure exerted on the 'sandwich', which presses the texture of the leaf into the lead. This is similar to Kyhl's process and resulted in a long debate as to who had invented the process.[935] Kyhl failed to pursue results using his technique, however, because he could not harden the lead plate. When he attempted to press objects into copper or steel, the plates needed to be etched further to achieve convincing results in printing. Auer had the advantage that he could combine the process with the galvanisation technique that had been invented in the meantime. An electrotype was made of the lead plate and then a second electrotype of the first. The first electrotype could be printed in relief, the second one (by hand) in intaglio. The original object is reproduced almost perfectly by inking the plates in its natural colours (Fig. 204).

Auer first published the process in 1853, illustrating it with specimens of the new method. The Hof- und Staatsdruckerei published about 40 sets of its type until 1896. The technique was adopted in France, Italy and the Netherlands immediately afterwards.[936] The Englishman Henry Bradbury, who had studied in the Hof- und Staatsdruckerei in 1852, was welcomed by Auer and generously presented with books and specimens of the Druckerei, among which was a printing plate made in *Naturselbstdruck*. He observed the process closely and performed and patented exactly the same nature printing technique upon his return in England to 1853.[937] His claims caused antagonism in Austria lasting for years, but Bradbury's prints were praised as equal to the Viennese ones.[938] Nature printing continued in England with relative success afterwards.[939]

Electrotype

An electrotype is a true reproduction of an orginal engraving or etching: in principle impressions pulled from the original or its electrotype are identical. The value of the process was therefore immediately understood by Spencer's contemporaries working with galvanising processes, such as Edward Palmer who further exploited the idea.[940]

In the first version of the process, the original plate was coated electrolytically with a layer of copper, which was a negative of the relief; this layer was then removed and itself coated.[941] The surface of the second layer was identical to the surface of the original. In a more efficient version the original plate is pressed in stearin, wax or other plastic material, creating a negative.[942] The surface of the wax is dusted with graphite or carbon powder to conduct the electric current and copper deposited electrolytically.

The electrotype replica is an exact match to its original in format and surface structure, but not in internal structure. The main difference is that the metal of the original plate is compressed due to hammering or rolling. An electrotype plate is produced by building layer upon of layer of atoms, which cannot be as compact as a hammered or rolled plate. Initially electrotypes could only withstand runs of a few hundred but further improvements increased this number to nearer 2,000.[943] Resistance could be improved by steelfacing, as suggested by Joubert some 20 years later.[944]

Despite its technical limitations, the technique remained in use throughout the nineteenth century. For the finer textured intaglio plates, natural rubber (*gutta percha*) is cast on the plate, the mould plated and the electrotype steelfaced for endurance.[945] Henry Bradbury's further experiments showed that an electrotype could be made directly from a steel plate by first coating the steel with nickel. The nickelfacing protected the steel plate so it could be immersed in the copper sulphate bath for electrotyping without corroding the steel; the electrotypes produced were of better quality than those made by casting in rubber.[946]

A further addition to the possibilities offered by steelfacing is offsetting a fresh proof on a new copper plate in order to make a new plate.[947] The copper is goldfaced, the gold does not attach to the fatty ink and the ink is washed off with a solvent. The plate can then be etched. The copper is corroded in areas devoid of gold, and the goldfacing protects the remainder of the plate.

Franz von Kobell further developed the earlier inventions. He painted on a silverfaced copper plate, the paint was dusted with a conducting layer of iron, silver or graphite powder, upon which a sufficiently thick layer of copper was deposited electrolytically. This layer was taken off, the hollow back filled up and the plate printed in intaglio. He lectured on his invention of 'galvanography' in 1840, published and was followed by others.[948] Edward Palmer developed a similar process, patented it in 1841, and published a handbook in 1842.[949]

Mechanical intaglio processes

As has already been described above, the engraver had some further tools at his disposal such as rulers, compasses and squares. The pantograph is referred to by Cochin and Rueda for making the preparatory drawing, although not for working on the plate directly. From 1757 onwards the first machines for creating crayon and tonal effects appeared. All kinds of supportive tools, machines and working methods were introduced from the late eighteenth century onwards, but discussed here are the first ruling machines.[950]

Ruling machines

A machine for ruling parallel, straight or curved lines on copper plates was invented by Wilson Lowry in England around 1790 and the first plate made with it appeared in 1792. The plate to be engraved or etched was set in a frame and a steel pen skimmed over the plate from one end to the other, drawing a straight line into its surface or into an etching ground; parallel lines are made at equal distances by moving the pen by means of a screw. Steel pens became blunt after some time and diamond points were used instead from 1798.[951] The machine was perfected by Nicolas-Jacques Conté in 1804.[952]

Ruling machines were used so frequently for hatching printing plates, which for the rest were drawn manually, that William Palmer considered they were 'of as much importance to engravers, and the advancement of their art, as the steam-engine is to the manufacturer'.[953] Areas of densely spaced engraved or etched parallel lines are typical of nineteenth-century steel engravings, lithographs and wood engravings.[954] These were usually prints prepared for the printing trade, but the more loosely drawn etchings by Charles Jacque also occasionally exhibit tones added by a ruling machine.[955] Undulating lines and *guilloches* could also be drawn mechanically, a technique that is still useful in the prevention of forgery of papers of value.[956]

Mechanical scanners based on the same system of levers and cogwheels were available in the late eighteenth century for transferring the relief of coins and the like to a printing plate by means of a series of more or less parallel lines – a process called 'anaglyptography' (Fig. 205). John Bate further developed the machine in 1832.[957] The scanning needle on one side of the machine slid over the relief of the coin or medal and on the other side its vertical movement was translated by means of the levers in a corresponding undulating horizontal movement on a printing plate.[958] The relief-like appearance in the print is achieved by the many parallel lines and their minor undulations. A drawback of Bate's machine was that the scanning needle could damage the original, for which he made a cast in glass or bronze. Jan Dam Steuerwald improved upon Bate's machine in 1839–1840 by reducing the pressure of the scanning needle in order to be able to work with (hardened) plaster casts of the originals.[959]

Photomechanical intaglio processes

The photosensitivity of certain dyestuffs was known to the Phoenicians who utilised the effect for creating their Tyrian purple; the pale greenish-yellow excretion of the purpur snail changing to a deep purple if exposed to light.[960] The influence of light on chemicals intrigued researchers from the later eighteenth century onwards and formed one of the principles of photography. The earliest steps in photography were actually attempts to reproduce engravings by means of light-sensitive material, such as when Joseph Nicephore Niépce copied engravings onto sensitised asphaltum from 1816 onwards, etched the plates and printed them in intaglio.

Daguerreotype

The situation improved when Niépce and Louis-Jacques-Mandé Daguerre signed a mutual contract requiring them to share information on their researches in 1829. Daguerre perfected the process that produced a silver plate – usually a silver-plated copper plate – onto which an image was acquired by means of the action of light on photosensitive chemicals, the light being directed onto the plate through a lens. The definitive step forward was the joint public presentation of the daguerreotype process by the Académie des Sciences and the Académie des Beaux Arts in the Institute de France in Paris on 19 August 1839.[961] Long awaited, it caused an immediate sensation and stimulated many to try their hand at the new 'engraving by light' (the definition of 'photography').[962]

Daguerreotypes are unique – only one plate at a time can be made by the process, multiplication of the plates is not possible.[963] The plates have a minor relief, however, which first Joseph Berres in Vienna (1840) and next Hippolyte Louis Fizeau in Paris (1841) tried to print in intaglio; others, such as Claudet, Donné and Grove followed.[964] These first 'photomechanical' processes were less than successful – the grooves of daguerreotype plates proved too shallow to print decently and the traditional oil-based printing ink used was too viscous for the fine structures. Also, the plates were not suitable for some types of editions therefore, in 1844, it was suggested that the daguerreotype plate should be copperfaced.[965] The plates were reworked manually adding etched lines and aquatint tones to make them printa-

ble.[966] It took until 1855 before a practical and successful way was found to print daguerreotype plates. Careful etching of the plate and using a wax-based instead of an oil-based printing ink was the key to this success (Fig. 206).[967]

But all this came too late. Niépce's nephew, Abel Niépce de St. Victor, had picked up where his uncle had left off and succeeded in producing photomechanically etched plates after linear examples in 1853. Next tones were added manually by means of dust-grain aquatint.[968] Englishman William Henry Fox Talbot was working parallel to, but independently from, Niépce and Daguerre on the development of photography. He used thin sensitised paper and in that way invented the photographic negative. It solved the difficulty of replication but produced another problem: the chemicals used to create the pictures darkened upon exposure to light – which was welcome for the necessary contrast, but chronic or extended exposure resulted in fading of the photographs. Talbot responded to this challenge by applying his process to the creation of intaglio plates on the basis of aquatint, patented in 1852 and 1858. Such plates could be printed in editions and with common intaglio printing ink, which did not fade.[969]

Photogravure

Talbot did not develop the idea commercially as he was more interested in research. For commercial activities we need to look to Frenchman Joseph Amand Durand who probably used a photomechanical etching technique similar to Niépce's. He successfully reproduced 400 famous historical engravings and etchings, such as those by Dürer and Rembrandt, from the late 1860s onwards.[970] Amand Durand never disclosed any details of his process, but the prints themselves provide some clues. They show that the original was transferred onto the plate by means of photography, for which he might have used a photosensitive layer of gelatin sensitised with potassium bichromate directly on the plate's surface.[971] A photo-positive is placed on the layer, the unprotected parts harden due to exposure to light and become acid resistant, the unexposed parts are washed out laying bare the metal and the plate is etched normally, the etched grooves printing black. Given the speckless impressions, the ground seems to have been retouched manually before etching to prevent any foul biting. Because of the high contrast required, the technique worked well for line work but not for tones, which were added by means of fine roulette structures straight into the metal plate.[972] Another difference when compared with the originals is the dense black ink Amand Durand used for printing his plates, particularly noticeable in comparison to Italian fifteenth-century originals that show dark grey lines.[973]

Talbot's technique was published, but its inventor was not interested in pursuing commercial success.[974] Amand Durand exploited it commercially, selling a high quality product, but his secrecy hindered others working on photomechanical processes.[975] Success both technically and commercially was achieved when Karl Klič presented the 'heliogravure' technique in 1879, later also known as 'photogravure'.[976] Photogravure was also a success because the process could be used fairly easily by photographers to make impressions in printing ink of their photographs. Instructive manuals were also available.[977]

Klič's method solved the problem of creating tones by first laying an aquatint ground on the plate, similar to Talbot's technique, to which a sensitised and exposed gelatin tissue was adhered. By etching in consecutive baths with ferric chloride of different strengths the various tones are bitten and the effect in the impression is a tonal scale richer than can be created by any manual etching process.[978]

The printing of these 'photogravure' plates still needed to be done by hand, however – mechanisation was not possible due to the plates' aquatint structures. Klič therefore continued to improve his process in order to mechanise the printing of photogravure plates. The Rembrandt Intaglio Printing Company was set up in Lancaster, England (1895) to produce prints according to Klič's new process, called 'rotogravure'.[979] The new technique combined three inventions but first and most important was the use of a gravure screen.[980] This screen, when placed between negative and light-sensitive ground, gave a fine geometric pattern in the etching plate instead of the irregular dots of dust-grain aquatint and allowed for a large bandwidth of greys in the print. Secondly, the processed plate was bent around a cylinder which, in combination with the screen pattern etched into the metal, allowed the ink to be scraped off the surface of the plate. This replaced the time-consuming wiping procedure.[981] Thirdly, the cylinder with the plate bent around it could be turned mechanically, printing the inked roller against a continuous paper web.

The printing trade, machine manufacturers and ink-producing companies followed these developments closely, applying for patent after patent.[982] Sensational at the time was the mechanisation of rotogravure by Eduard Mertens in 1910, which allowed the printing of intaglio illustrations in journals in runs of tens of thousands and soon in hundreds of thousands.[983] Now, for the first time, the complete process of producing and printing an intaglio matrix was performed without any major human interpretation or intervention. Rotogravure is still used nowadays for high quality colour reproductions and glossy magazines.[984]

Artists' reactions

The introduction of photography and the revolution in the printing trade were reasons for artist-etchers to concentrate on manual work, eventually also printing their own plates. Georges Meusnier and George Rhead are later exponents of the divide between the artist-etcher and the printing trade at the end of the nineteenth century. Rhead (1890) found that 'photogravure is merely reproductive ... it cannot in any sense be original'.[985] Meusnier (1891)

looked down in disdain on photomechanical processes, regarding them as a threat to the artistic development of students who might lose initiative in their research of form and design.[986] In his view, only the experienced artist can decide as to whether or not he can use a particular technique.

Notice the difference between Rhead and Meusnier, who wrote for an artistically interested audience, and their contemporary Villon, who addressed the professional engraver and for whom photogravure was one of many tools available to the professional engraver.[987] A more moderate author writing for artists, such as Walter Ziegler (1912), thought it would be useful for printmakers to also learn about industrial techniques and he could even appreciate their qualities.[988]

Despite this opposition, photomechanical processes found their way into more artistic works, as Meusnier's 'experienced' artists started looking beyond the international fashion of the Etching Revival. Félicien Rops further processed the photogravures he had made of his drawings, for which he developed a special soft-ground.[989] Georges Rouault also had his watercolours reproduced as photogravures, which plates he heavily overworked. In this way they created completely new, and above all original, images.[990] Photogravure revived from the 1960s as an artistic medium, adapting to modern processes with further technical developments, such as the use of stochastic screens instead of dust-grain aquatint and of digitally processed imagery.

Digital intaglio processes

The first steps towards digital printmaking, or using computers to make prints, were taken in 1952. These concerned photographs made of monitor images of an oscillograph and were followed by drawings produced by means of a computer plotter.[991] Jules Heller reproduced such a computer-designed image by artist Richard Fraenkel and programmer Jeffrey Raskin in his manual on printmaking in 1968 and remarked: 'While not itself a print, Figure 1 suggests that new and unexplored fields still lie ahead.' The image was drawn with a plotter onto paper, but Heller foresaw that 'with variations and substitutions of materials and processes, a relief print, intaglio, or serigraph, or any combination thereof, could be achieved in one or more colors'.[992]

Imagery generated on screen can be shown as it is, stored on a data carrier, or processed into a tangible object. The reproduction of the image onto supports went in two different directions. The first is the printing of digital pictures directly via a computer printer in manners different from classical printing methods. This is the kind produced by Fraenkel and Raskin and what we now call a 'digital print'.[993] The other is what Heller predicted: various hybrid forms of digital designs in combination with 'classical' or 'tangible' printmaking techniques. In more direct forms the image is prepared on screen and digitally printed on a transparent sheet to make a negative or positive contact sheet. The sheet is placed upon a plate with a photosensitive layer and exposed to a light source.[994] With earlier versions the metal plate underneath the layer was etched like a photogravure, the first varieties appearing around 1980.[995] With modern versions, the unexposed parts of the photosensitive film are washed out and the plate printed as it is without further etching; the washed-out textures are deep enough to print in intaglio. This is the common method for solarplate or photopolymer film, although the metal plate underneath may be etched further, too.[996]

Furthermore, the transparent sheet can be traced by hand onto an etching ground and the plate etched as normal, or traced on a mezzotint plate, and so on. This is fairly common practice and is not so very different from historical practices of tracing prints or drawings.[997] Another computerised technique involves attaching a needle to a plotter printer and allowing the needle to draw into the etching ground or straight into the plate (similar to drypoint) as the plotter would draw on paper.[998] In all cases plates are printed manually.

Discussion

The development of plate-making processes can be traced by the series of inventions and reinventions throughout the ages. In many cases, names of inventors or first users of particular etching and engraving techniques have come down to us either because their experiments have survived or because inventions were recorded in writing. From the later eighteenth century onwards, new techniques were published in journals as soon as their inventors thought it appropriate. Patents were issued that recorded designs of tools and machines, and engraving and printing processes in full detail. Modern intaglio printmaking techniques are rarely patented now, but developments can be followed closely through publications in specialist printmaking magazines. The keyword in this continuous flow of printmaking developments is 'experimentation'. It is the curiosity of the creative mind trying new materials and working methods, and combinations of older techniques with new concepts, to see what results they will give, how much they differ from existing processes and how imagery created in this way appears.

Notes

1
Reddy (Albany 1988): iv.

2
Begheyn 2001; *Bentley 2007*; *Heenk 1997*; *Hinterding 1995*; *Slatkes 1998*; *Williams 1974*; *Yasui & Kamitani 2011*: 5–20. Note that the trade in printing plates is not part of the present study.

3
Griffiths & Williams 1987: 149–150. For plate collections kept in museums, printrooms and other institutions see: *Aôdô Denzen 2004*; *Cooney 1996*: 31; *Copper Plates 1992, 2006*; *Cruz de Carlos 2003*, figs 151, 152; *Foden 1996*; *Hameleers 1990*; *Hinterding 1995*; *Hollstein Dutch & Flemish*, 69, *The Wierix family, introduction and guide to the catalogue*: xxiv, cxxxv; *Oberschelp 2002*; *Vannucci 2003*; *Von Heusinger 1981*; *Weixlgärtner 1911*. Many more collections keep printing plates but very little has been published on the subject.

4
For the chalcographie of the Koninklijke Bibliotheek/Bibliothèque Royale in Brussels see: *Six siècles 2005*. For the Chalcographie du Louvre in Paris see: *Torres Guardiola 2003*. For the Calcografía Nacional in Madrid see: *Alegre Nuñez 1968*; *Carrete Parrondo 1987*; *Lage de la Rosa et al. 1992*: 591–593. *Government 1883* is an early discussion of the activities of the Calcografia Camerale Romana in Rome, the oldest of the four chalcographies founded on 15 February 1738 by Pope Clement XII. For modern literature see: *Petrucci 1953*; *Vannucci 2003*.

5
Lage de la Rosa et al. 1992: 592, 594. For the sixteenth–nineteenth centuries the Madrid Calcografía keeps copper plates only, diversification starts after 1800. A method to detect the material of the original plate by analysing its print is in development; *Knuutinen & Stijnman 2010*.

6
An exception is the analysis of an iron etching plate by Burgkmair; *Williams 1974*. A chemical analysis of Rembrandt's copper plates performed c.1920, 'proved that the plates were 95% copper with impurities of tin, lead, zinc, arsenic and silver; *Strauss & Van der Meulen 1979*: 478.

7
For a summary introduction to copper, copper alloys and their production see: *Stokroos 1996*: 6–7.

8
Bosse (Paris 1645): 12. The qualities of copper for plate engraving are discussed occasionally afterwards; **Netto 2** (Quedlinburg 1840): 6; Thon = **Perrot** (Ilmenau 1831): 67–69; **Roller** (Wien 1888): 10–11; **Stapart** (Paris 1773): 14–23.

9
Chomel 1778, 2 (1778): 1684: the plate should be made from the best, soft, red Swedish copper, without holes or cracks. **Schellenberg** (Wintherthur 1795): 7: copper comes from Hungary, Norway and Sweden. *Swedenborg 1734-2*, deals extensively with the production of copper at the various European mines, with a reference also to copper from South America on p. 207.

10
Deleschamps (Paris 1836): 9–18.

11
Villon (Paris, 2nd ed., 1914): 34–36.

12
An exception is the mention of copper etching plates of just 0.6 mm thick; **Buonaccorsi** (1913): 12. An advantage of such thin plates is that they are lighter and can therefore be carried about easily when working after nature. They are also cheaper, for which reason thinner copper plates are chosen by modern printmakers.

13
Hinterding 1995: 40–57. Plate thicknesses vary between 0.5 and 1.84 mm, with an average between 0.8 and 1.5 mm. The following of Rembrandt's etching plates, 23 out of the 82 measured (28%), are less than 1 mm thick: B. 19 (0.97 mm), B. 20 (0.83 mm), B. 22 (0.93 mm), B. 33 (0.78 mm), B. 37 (0.64 mm), B. 41 (0.98 mm), B. 45 (0.5 mm), B. 64 (0.92 mm), B. 69 (0.83 mm), B. 92 (0.88 mm), B. 98 (0.91 mm), B. 105 (0.97), B. 113 (0.84 mm), B. 123 (0.93 mm), B. 126 (0.83 mm), B. 128 (0.98 mm), B. 131 (0.76 mm), B. 152 (0.97 mm), B. 195 (0.73 mm), B. 196 (0.91 mm), B. 237 (0.97 mm), B. 272 (0.92 mm), B. 368 (0.84 mm).

14
Hinterding gives plate sizes in millimetres and weights in grams. The plate's weight was divided by its volume in order to relate it to the standard voluminal mass, which is given in kilograms per cubic decimetre (kg/dm³) at 20°C.

15
Brass, an alloy of copper and zinc, was used for engraving relief plates (*Messingschnitt*) in Germany in the nineteenth century. For examples see: Wolfenbüttel, Herzog August Library, Top. 21b: 11, Top. 21c: 56.1, Top. 21c: 56.2.

16
See Chapter 1, p. 25.

17
Bosse (Paris 1645): 12.

18
Stapart (Paris 1773): 11; repeated by **Perrot** (Paris 1830): 31.

19
Deleschamps (Paris 1836): 18.

20
Perrot (Paris 1865): 28.

21
Bronze plates were used by Japanese etchers around 1800; *Hosono 1978*: 149–150.

22

Deleschamps (Paris 1836): 8, 18–22; **Perrot** (Paris 1865): 27; same text as Perrot's in **Villon** (Paris, 2nd ed., 1914) 1: 168.

23

Dürer sent a letter with two prints pulled from an engraved gold plate (*sind jn golt geschtochen*) to Georg Spalatin in early 1520; *Rupprich 1956–1969*, 1 (1956): 87. This concerned a small roundel with a crucifixion; *Hollstein German*, 7: no. 24. There is a long discussion concerning the function of the plate, whether the plate was meant as a sword pommel or hat decoration; *Panofsky 1948*, 2: 22 no. 130; *Schoch et al. 2001*: 224–225 no. 90; *Strauss 1981*: 256–257.

24

Viljoen 2010: 26.

25

Frederiks 1958–1961, 2 (1958): 5–36; *Griffiths 1993*: 170; *Hayward 1953*; *Von Heusinger 1981*.

26

Hollstein Dutch & Flemish, 68, *The Wierix family part X*: 31 no. 2117. *Hollstein Dutch & Flemish*, 69, *The Wierix family, introduction and guide to the catalogue*: xxiv, (says 'H. 2117', which should be 'H. 2118'). Hendrick Goltzius engraved a series of portrait medallions, some in silver or gold, a number of which were contemporary or printed later; *Griffiths 2007*; *Hartley 1991*; *Voigtmann 2003*. *Strauss 1977*: no. 179 is printed from a silver, no. 226 from a gold medallion, other prints with texts in reverse are nos. 110, 127, 133, 137–140, 145, 147, 163–165, 187, 188, 190. Cherubino Alberti engraved a portrait on a silver plate in 1593; *Bury 2001*: 30. Simon de Passe produced a series of silver medallions that was printed only much later, and one rectangular silver plate (*argento in sculptam … 1615*) that was intended for printing because its text was engraved in reverse; *Hollstein Dutch & Flemish*, 16: nos. 11, 36, 51, 53, 60, 68, 69, 71, 72, 85, 87, 89, 95; *Veldman 2001*: 229–232, fig. 126. A seventeenth-century print of a gold medallion engraved on the occasion of a marriage (*trouwpenning van fijn goudt*) by Pieter Serwouters is reproduced in *Waller 1974:* opp. p. 319. Twenty small silver engraved medallions of the later fifteenth century were printed for reference purposes in 1858; *Passavant 1858-2*. *Fiedler 1978*: 89–90, pl. 90B, and *Schwarz 1995*: no. 43 both have impressions from the same gold plate.

27

A fifteenth-century impression of a circular plate with a pentagonal extension with a hole at the top must have been (part of) a medallion; *Bradshaw 1889*: 255, pl. 9. A circular print with text in reverse by Magdalena de Passe answers the description and could thus perhaps be printed from a silver (gold?) plate in line with the output of silver plates by her brother Simon de Passe, see above; *Hollstein Dutch & Flemish*, 16: 212, no. 2. Most copies after the abovementioned Dürer print from a gold plate also copy the reversed text as it is, although it is unlikely that the copies were cut in gold, too, because the information is in Dürer's letter and early copyists were probably unaware that the original was printed from a gold plate. The text in the lower half of the *Portrait of Doctor Fransois Maelson* by Johannes Wierix says the portrait is 'cut in silver' (*Dus heeft men MAELSONS Beelt in zilver uitgesneden*). The print is atypical for impressions from silver plates, however, because the plate was rectangular instead of oval and the text is 'normal' instead of in reverse. Atypical also is that three states of the plate are recorded. Hollstein's compiler has seen 31 impressions of the plate. This is an unusually high number for a Wierix portrait, which either means the impressions have never been for sale and are always kept in collections, or that the plate was copper and went through a reasonable print run; *Hollstein Dutch & Flemish*, 68, *The Wierix family, part X*: 21–22 no. 2120.

28

Griffiths 1994-1; *Von Heusinger 1981*, figs 25–27, 34. Enea Vico had his plate with a portrait of Emperor Charles V gilded and presented the gilded plate to the emperor; *Roskill 1968*: 108–111; *Viljoen 2010*: 20, with thanks for the opportunity to read this text before publication. The Herzog August Library keeps a manuscript with a series of impressions of roundels from around 1700. A note on fol. [1]v reveals that after printing the plates were fire gilded and placed in the ducal art collection in Blankenburg; Wolfenbüttel, Herzog August Library, Cod. Guelf. 272 Blankenburg. Gold, silver and gilded engraved plates would have been put on display; *Bury 2001*: 30.

29

See Chapter 1, p. 24.

30

Bentley 2007: 740.

31

Tischbein (Zwickau, 2nd ed., 1827), pl. 11, 13, 17.

32

Deleschamps (Paris 1836): 23; **Jacque** (1852): 188; **Querfurt** (Wien 1792): 111; **Robert** (Henri; Paris c.1900); *Senefelder 1818*: 7, 10, 47, 58; *Singer et al 1954–1984*, 3: 409–410; **Villon** (Paris, 2nd ed., 1914) 1: 377.

33

Robert (Henri; Paris 1900). Various techniques have been used for musical annotation, woodcut, etching and engraving, from copper and tin plates, relief printing from metal plates, special metal type, lithography.

34

Deleschamps (Paris 1836): 23–24.

35

See Chapter 1, p. 52.

36

According to the literature, some etchings after Jan Swart (of Groningen) were made on iron; *Hollstein Dutch & Flemish*, 29: 123–125. Gerhardt Janssen made etchings on iron and some of his plates are extant; *Roethlisberger 1987*. Jacobus Harrewijn seems to have etched on iron; *Waller 1974*: 131. Jean-Baptiste de Grateloup reputedly engraved and etched on steel; *Hind 1963-1:* 150; *Hunnisett 1987*: 380; *Prideaux 1968*: 72–73; *Thieme-Becker*, 14, 'Grateloup, Jean-Baptiste de': 543. Paul Sandby carried out experiments in aquatint etching tones on iron plates by merely brushing the metal with acid; **Sandby 1** (London 1775). Many recipes for etching iron exist, but in all cases they concern the decoration of iron objects. Not a single recipe or prescription for etching iron plates exists until the introduction of steel engraving by means of acid in the mid-1820s. For modern manuals on etching iron intaglio plates see: **Braun** (Augsburg 1973); **Graziani** (Firenze 1991).

37

Dictionnaire portatif 1766, 1: 586–588; *Hunnisett 1987*, 15(10): 376–380; *1998*: 24–28.

38

See below under 'The burin'.

39

Molard (1811); **Perkins 1** (1810); *Woodcroft*: 122–123: English patent, A.D. 1810, October 1.–No. 3385.

40

Mr Schey received a *Brevet d'invention* for 15 years on 31 March 1808; **Perkins 4** (French ed. of 1822): 130–132.

41

Bathe & Bathe 1943.

42

Harris 1968–1970, 4: 66–74; *Hunnisett 1980*: 11; **Partington** (London 1825): 128; **Perkins 1** (1811): 258, says 'plates much thicker than ordinary'. The process was called 'siderography' at the time.

43

Perkins 1 (1811): 264–265; **Perkins 2** (1820-1): 165–169; *Woodcroft 1969*: 123, 145. English patents, A.D. 1810, October 1.–No. 3385 and A.D. 1819, October 11.–No. 4400. For further discussion of the press see Chapter 4, p. 304.

44

Hunnisett 1980: 12; *1998*: 37.

45

Turner (1824). For details see below under 'Plate metal'.

46

Hunnisett 1980: 13–14.

47

Ibid., 21–26

48

Others also worked on the process of hardening steel; **Colla** (1842).

49

Perkins 4 (1821) is illustrated with two impressions of the same block, one pulled at the beginning of the edition, the other after 30,000 runs. The minor differences visible are due to wiping and not to wear.

50

Francis (1842) 3: 59–61; **Kästner** (1841).

51

Perrot (Paris 1830): 138–144; Thon in **Perrot** (Ilmenau 1831): 297–300. Thon possibly gives the oldest reference to the technique of steel engraving in Germany: VII: *Die Siderographie ist, in Deutschland wenigstens, noch in der Entwicklung begriffen, und das praktische Verfahren im Allgemeinen noch zu sehr Geheimniß der einzelnen Künstler, als daß sich viel darüber hätte sagen lassen.*

52

See below under 'Mordants for steel plates'.

53

Hunnisett 1998, especially pp. 233–235, after which the individual countries are discussed. For steel engravers in the Netherlands see: *Hunnisett 1998*: 309–317; *Van der Blom 1978*: 97–102; *1981*.

54

The Printing Times and Lithographer, new series, 8 (1882, Jan. 15): 16, col. 1.

55

Villon (Paris, 2nd ed., 1914) 1: 151–167, which is a summary of nineteenth-century sources on etching steel.

56

See below under 'Photomechanical intaglio processes'.

57

Chamberlain (London 1972): 35; **Pyle** (New York 1941): 71–73; **Silsby** (New York 1943): 28–41; **Verbruggen** (Amsterdam 1981): 159–160. Manuals on etching iron and steel were published by Braun and Graziani at that time; **Braun** (Augsburg 1973); **Graziani** (Firenze 1991).

58

Craddock 1998; *Laub 1997*: 77–90; *Lucca 2003*: 111 no. 76; *Ruette 1995*.

59

Diderot & D'Alembert 1751–1781, *Planches*, cinquième livraison, ou sixième volume (1768), *Histoire naturelle*, *Minéralogie*, *Travail du zinc*: *Cette planche représante les plans, coupes & élévations du fourneau servant à séparer ce zinc de la mine de plomb au bas hartz, dans le duché de Brunswick.*

60

Lithographs could also be printed from zinc plates; **Eberhard** (Darmstadt 1822): 1–2. The Rijksmuseum in Amsterdam has an interleaved copy of Eberhard's manual (shelfmark no. 324 E 7) with, next to the ten *Probeblätter*, an extra 14 etchings on zinc by Nolthenius de Man of around that period.

61

Delâtre (Paris 1887): 33; **Deleschamps** (Paris 1836): 22; **Jacque** (1852): 188, for very large plans and maps; **Lalanne** (Paris 1866): 77. For the use of zinc by French Impressionists see: *Guérin 1945*: 52.

62

Bruno Zwiener chose nickel-zinc for use by children and novice students because it cost only a tenth of copper; **Zwiener** (Bruno; Mühldorf 1928).

63

See Chapter 4, p. 331.

64

Perrot (Ilmenau 1831): 114. Compare this with suggested use of lead white found in the black ink of engravings by Goltzius; *Schenck 1998*.

65
Gross (London 1970): 159–160; **Saff & Sacilotto** (New York 1978): 409–410.

66
A purportedly 2,000-year-old Persian forerunner of galvanisation relies on nineteenth-century English technological influences in the Middle East; *Eggert 1996*. For a history of electroplating see: *Raub 1993*.

67
Heidtmann 1984: 571; *Jacobi 1840*: I; *Nadeau 1989–1990*: 100 (Electrotyping Process).

68
Bridson & Wakeman 1984: nos. A 99–103; *Dyson 1984*: 52–53; *Nadeau 1989–1990*: 100 (Electrotyping Process). Charles Walker gathered all the information on galvanisation in two slim but highly popular volumes that reached their 19th ed. in 1855 and 29th ed in 1859; *Bridson & Wakeman 1984*: no. A116; *Walker 1841 & 1843*. The subsequent editions were updated. The most complete version is probably the 3rd German edition after the 18th English edition of 1855, because the translater added some further details; *Walker 1856*: XIV. See also: http://www.greenart.info/galvetch/contfram.htm (2010).

69
In Spencer's first tests he copied coins, a process that is still performed in some Asian countries; specimens in my collection. Perhaps Spencer considered that his process could be seen as counterfeiting therefore replicating printing plates would be safer. See below under 'Electrolytic etching' and 'Electrotype'.

70
See below under 'Daguerreotype'.

71
Fizeau (1844). A curious invention was patented by Theodore Bergner in 1856. It concerns preparing the surface of copper plates or copperfaced steel plates with mercury, which does not adhere to iron. 'On plates so coated the ink, when applied by a "sharp" inking roller, will not adhere to or soil the mercurialized portion, while it fills and remains in the engraved lines'. Other metals may also be used; *Woodcroft 1969*: 515–516: English patent A.D. 1856, February 7.–No. 331. See Chapter 4, p. 313. It is not clear what is meant by a 'sharp' inking roller. Perhaps it is something like a doctor blade, for scraping ink from the plate's surface.

72
The Journal of the Society of Arts, 6 (1858), no. 313 (19 Nov.): 14: 'Meetings for the ensuing week ... Wed. Society of Arts, 8. Mr. F. Joubert, "On a Method of rendering Engraved Copper-Plates capable of Producing a greatly-increased Number of Impressions"'.

73
Hunnisett 1980: 197–198. **Joubert 2** (1858). On p. 16 Joubert refers to his 'friend Jaquin' who took out the patent in March 1858 and Jaquin is also referred to in **Meidinger** (1859): 36.

74
Hunnisett 1980: 198; **Joubert 2** (1859).

75
Joubert 2 (22 July 1859). Bradbury also patented, in England, the nature printing process he was shown in Vienna which also caused conflicts; see below under 'Impressing'.

76
Joubert 2 (25 Feb. 1859); **Joubert 2** (4 March 1859); **Joubert 2** (22 July 1859): 602.

77
Bradbury 1 (1856); *Bradbury 1856*: 19; **Joubert 2** (22 July 1859).

78
Joubert 2 (4 Feb. 1859). Joubert states that, because zinc is a soft metal it cannot be used as a coating material on copper plates if long print runs are required; **Joubert 2** (11 Feb. 1859). However, the engineer Henry W. Reveley supports Bradford with the observation that 'the intimate union of these two metals' produces a brass, 'sometimes of great hardness'; **Joubert 2** (18 Feb. 1859). Bradbury had further experimented with nickel, palladium and platinum; **Bradbury 2** (1860); **Joubert 2** (25 Feb. 1859). Joubert had knowledge of other metalfacing processes, but kept to his own process of using iron; **Joubert 2** (4 March 1859).

79
Joubert 2 (22 July 1856): 602; **Joubert 2** (5 Aug. 1859). An issue to be observed here is that Bradbury's company Bradbury, Wilkinson & Co. (est. 1856) specialised in the production of banknotes, while Joubert's aims may have been more general.

80
Meidinger (1859); **Neue technische Erscheinungen** (1860); **New applications of electricity** (1860); **Richmond** (1892); **Steel and iron facing** (1882). See also *Bridson & Wakeman 1984*: B118 and B131. The Victoria and Albert Museum acquired a steelfacing unit for their exhibition of printmaking materials; *Short 1904* (ed. 1914): 17, item 80.

81
Short 1904 (ed. 1914): 17, item 80. Chromefacing, see below, is removed with hydrochloric acid; *Smith et al. 1951*: 312. Nickelfacing dissolves in diluted nitric acid (10–15%).

82
First mentioned by Koehler in his translation of Lalanne's manual; **Lalanne** (Boston 1880): 73.

83
Paton (1892–1894), 3 (1893–1894): 148; **Paton** (London 1895): 159.

84
Defacing: removing the thin layer of iron from the copper plate by washing the plate with diluted (5%) nitric acid. The layer of iron disappears quickly leaving a clean surface without corroding the copper and the plate can be steelfaced again.

85
Bradbury (1860), concerns nickelfacing steelplates in order to make electrotype replicas; **New applications of electricity** (1860) mentions Bradbury's invention of nickelfacing copper plates, 'hard and enduring, and can be re-applied'. See also *Urquhart 1881*: 205–210. **Böttger 2** (1877), for improvement of his own salt solution for steelfacing copper plates. **Gaiffe** (1878), for cobaltfacing copper.

86
Silsby (New York 1943): 106–109, mentions working with chromefaced copper and zinc plates. Many other manuals just mention steelfacing without any further details. Plating with steel is common in England, Germany and France nowadays, formerly also in the Netherlands. Chromefacing is still carried out in Japan and Spain.
87
Neale (1927): 65; **Saff & Sacilotto** (New York 1978): 410; both mention chromefacing.
88
López Alonso (2006); **Pyle** (New York 1941): 4, 71–72; **Silsby** (New York 1943): 46–59; **Verbruggen** (Amsterdam 1981): 161–162; **Villon** (Paris, 2nd ed., 1914) 1: 169. Aluminium may already have been mentioned in the first edition of 1894 but I have not seen this edition.
89
Semenoff & Bader (1998), for the salts solution; **Verbruggen** (Amsterdam 1981): 161–162.
90
Rocked aluminium and copper plates prepared for mezzotint are produced by Shin Nihon Zokei Co. Ltd., Japan.
91
Chamberlain (London 1972): 33, for micro-metal; *Gilmour 1986*: 121–123; **Hayter** (New York 1981): 52, for magnesium alloy; **Paglialonga** (Pescara 1985): 65.
92
Weiss et al. 1986: 60–61, 66–67.
93
Gatouillat 2000; *Merrifield 1849*: 494–495; *Pilosi et al. 2006*, with references to fifteenth- and sixteenth-century sources for and specimens of etching glass.
94
Cassebaum 1983. Eighteenth-century chemists and pharmacists were aware that bottles made of imperfect kinds of glass were etched by the acids they stored; *Action des acides 1800*.
95
Liebhaber 1 (Nürnberg 1696) 1: 313 and 2: 381, both recipes are the same.
96
The mineral fluorite containing calcium fluoride (CaF_2) was known as a semi-precious stone from ancient history. It was mined in Germany in the sixteenth century for use as a flux in glass production, soldering and the melting of metals, and occasionally as a pigment; *Kosinova 2002*: 8; *Richter & Fuchs 1997*; *Ullmann 1972–1984*, 11 (1976): 603–606. For etching glass see: *Kühn 1984*: 42–45.
97
Chapman (New York 1870): 270; **Compendium** (London 1797): 201; **Partington** (1826–1827) 3 (1827): 16–19; **Schad** (Leipzig 1800): 54; **Silliman** (1824); **Spilsbury** (London 1794): 24–25, the etching fluid is called 'sparry fluor (calcium fluoride, CaF_2) or Derbyshire blue John, powdered, [with] concentrated vitriolic acid, [in] water'.
98
Fielding (London 1841): 26–27.
99
Audin 1972: 217; **Partington** (London 1835): 134–137, for technical details.
100
The Edinburgh Library keeps a letter, dated 27 April 1790, from Professor Patrick Wilson to Professor J. Black on the etching of and printing from glass plates; Edinburgh Library, Gen. 873/111/184-185. *Audin 1972*: 217.
101
Annales de chimie, 19 (1797): 364, without details; **Boudier** (1799); *Weixlgärtner 1911*: 384, describes two glass printing plates made by C.W. Böckmann in 1797 and 1802 respectively. His plates seemed capable of printing an edition of 10,000 copies; *Hammann 1857*: 249. The minutes of the Académie des Sciences, kept in the Institut de France in Paris, for 23 October 1799 make note of the invention of Boudier fils to etch on glass. A commission was supposed to examine the process, but no report exists. With thanks to Jacques Bocquentin for checking these minutes and looking for the report. The texts are vague and it is unclear whether this concerns relief or intaglio printing. Boudier's intentions are also uncertain. A note in the *Oeconomische Courant* suggests he thought of decorative borders around documents, or for glass cylinders for printing textile by means of a roller printing press; *Boudier 1800*. Perhaps also he was considering a technique to prevent counterfeiting; *Audin 1972*: 217–218.
102
Böttger & Bromeis 1 (1844); **Deleschamps** (Paris 1836): 172–174; **Franke** (1844); *Hammann 1857*: 247–253; **Perrot** (Paris 1865): 329–341; **Prestl** (1845); *Schaar & Hopp 1977*: 40–41, 45, fig. 50; **Sillimann** (1824). There are several references to a Mr Hann active in Warsaw who would have invented glass plates for relief and intaglio printing in 1824 and called it *Hyalotypie*, but nothing conclusive could be found concerning his activities; *Eder 1922*: 318. Rob Meijer studied the subject of hyalography and submitted two internal notes about it for the working group Dr. N.G. van Huffel in 1994 and 1995. This paragraph on glass is based on these notes and on the ensuing discussions among the members of the working group.
103
Böttger & Bromeis 2 (1855), the part on etching on p. 29, col. 1 is almost identical to **Prestl** (1845).
104
Heuermann 2007; *Kerslake 1994*; **Paglialonga** (Pescara 1985): 77; *Prints 1987*; **Thorstensen** (Oslo 1946): 109–110; **Welden** & **Muir** (New York 2001): 127; **Werner** (Krakow 1972): 118, 120. E. Tapper & R. Whiteley, *The Glass Printmaking Workshop*, report on their workshop for engraving, sandblasting, etching and printing glass intaglio plates; http://www.glassaustralia.anu.edu.au/printing/tapper.print.html (2003, no longer accessible).
105
Bayard (Paris 1901): 7; **Ziegler** (Halle an der Saale 1901): 46. S.G.D.G., or: *sans garantie de gouvernement*, a term used in France between 1844 and 1968, which means that the invention is registered but not guaranteed by the government.

106

Werner (Kraków 1972): 98.

107

Erremes (Leuven 1942): 73–77; **Heller** (New York, 2nd ed., 1972): 259; **Jurkiewicz** (Kraków 1938–1939): 15; **Kosloff** (Chicago 1940), monograph on the subject; **Pyle** (New York 1941): 5; **Silsby** (New York 1943): 112. Instead of celluloid, sheets of gelatin may be used.

108

Andrews (Englewood Cliffs 1964): 121; **Banister** (New York 1969): 86; **Chamberlain** (London 1972): 120; **Daniels** (London 1971): 168; **Marsh** (London 1975): 110; **Maxwell** (Englewood Cliffs 1977): 61–63; **Newman 1** (Philadelphia 1964): 173–174; **Newman 2** (New York 1977), a monograph on plastic for printmaking; **Peterdi** (New York 1959): 214–218; **Plastic engraving** (1956); **Preiß** (München 1971), monograph on plastic used for printmaking; **Zaidenberg 3** (New York 1964): 75. For an earlier variety see: **Boston films drypoint process** (1929).

109

Brown 1 (2006); *Franck 1976*: 300; **Maxwell** (Englewood Cliffs 1977): 62–63.

110

See below under 'Transferring the design'.

111

Maxwell (Englewood Cliffs 1977): 63.

112

Peterdi (New York 1959): 216.

113

Woodman 1997; **Woodman** (Beaverton 2006).

114

For technical details and references on the following see below under 'Solarplate and photopolymer film'.

115

Quenedy (1827).

116

Dröge (Berlin 1930); **Erremes** (Leuven 1942): 73–77; **Rothe** (Wien 1929). See also Chapter 2, p. 86.

117

Furchau 1 (1846), **Furchau 2** (1847).

118

Linoleum was patented by Frederick Walton in 1860 and 1863.

119

Zwiener (München 1920).

120

Verbruggen (Amsterdam 1981): 160–161.

121

Daniels (London 1971): 167. Early examples may be found with some intaglio-printed wood engravings by Eric Gill of the 1920s but I have not seen these.

122

See below under 'Collagraph'.

123

Fiedler 1978: 91–92, pl. 92b (specimen). Engraving ivory printing plates was performed in England, France and Austria, presumably in the first decades of the twentieth century. A larger part of the ivory available was and is from mammoths, which is too old and thus too brittle for engraving and intaglio printing. See also: **Método** (S.l. 1700). Etching ivory is possible, but only performed in the decoration of objects; **Lady** (London 1845): 72–73.

124

Chapman (New York, new ed., 1870). p. 271; **Deleschamps** (Paris 1836): 232–233; *Hupp 1910*: 148–152, 'Kunstschätze des Regensburger Rathauses – Geätzte Kelheimer Platten', for etched limestone; **Lady** (London 1845): 74; *Meijer 1999*; *Santos 1991*; **Schad** (Augsburg 1800): 54; *Senefelder 1818*: 7–12; *Wegner 1958-1*: 179; *Weixlgärtner 1911*: 342–345.

125

Wagner 1914: XVI, 12, 14, 18–23.

126

Lady (London 1845): 75. The process is similar to stone engraving; *Antreasian & Adams 1971*: 376.

127

There were two distinct methods of producing copper, the English and the German, which were used until well into the nineteenth century; *Diderot & D'Alembert 1751–1781, Receuil de planches, cinquième livraison, ou sixième volume*, (1768). *Histoire naturelle. Métallurgie, Travail du cuivre*, pl. V; *Höhne & Rösling 1996*: 89; *Stokroos 1996*: 6; *Westermann 1999*, for the production and trade of copper. *Copper as Canvas 1999*: 329–330, illustrates seventeenth-century copper ingots.

128

Encyclopédie méthodique 1782–1832, Arts et métiers mécaniques, 2 (1783): 122–125.

129

Béguin 1998: 277 (*Planage*); *Deutsche Encyclopädie 1778–1804*, 23: 723, a water-powered hammer was used in France; *Höhne & Rösling 1996*: 89–90, 100–105, pl. 2. Rolling copper plates seems to have been practised in Amsterdam in 1611, but the information is vague and it is not clear what is meant; *Van Dillen 1929*: no. 1210.

130

Diderot & D'Alembert 1751–1781, Receuil de planches, seconde livraison, seconde partie (= vol. 3, 1763). *Chaudronnier, Planeur,* pl. III, fig. 2 (*Planeur*), fig. 6 (*Ouvrier qui présente un cuivre à un graveur*) (see Fig. 101, p. 108). *Béguin 1998*: 277 (*Planage*), figures after **Profit** (Paris

1913): 16–17, 35–36; **Bosse** (Paris 1645): 13; *Deutsche Encyclopädie 1778–1804*, 23: 723, depending on its size two to four men hold the plate with tongs, while another man hammers it; **Filleau des Billettes** (Paris 1693–1698): 111; **Profit** (Paris 1913): 16–17.
131
Bagelaar 1817: 8, n. c; **Filleau des Billettes** (Paris 1693–1698): 111; **Steel** (London 1938): 14–15.
132
Berlinghieri 1482; *Skelton 1966*. See also Chapter 1, p. 26. Cracks in copper plates appear often in prints of the fifteenth to the seventeenth century. Usually they are visible as a web of fine irregular lines, but sometimes larger cracks are visible. If a crack becomes too large the plate can break at this point. Soldering the pieces together is a possibility, but the soldering will always be visible in the print as irregular blotches. A better option would be to solder the pieces to a second plate in order to keep the pieces together, which would not show in the impression, but we have no documentation or examples of this. With thanks to Catherine Jenkins for discussing the issue.
133
For a discussion on 'states' see Chapter 4, p. 319.
134
The examples are the *Portrait of Paulus Pontius* (NHD 8-I, see Fig. 117), *Portrait of Jan de Wael* (NHD 15-I), *The Mocking of Christ* (NHD 519), and *Titian and his Mistress* (NHD 628-I). The irregular plate gives the impression that it has come straight from the coppersmith without further preparation than the first hammering and sanding.
135
When Goltzius engraved the portrait of his deceased master Dirck Volkertsz. Coornhert in 1590–1591 he added Coornhert's four main occupations in the four corners. Upper left: writing equipment and manuscripts testify to Coornhert's professional occupation as secretary and notary. Lower left: the weaponry tells us he was a master fencer. Lower right: in his younger years he was a gifted musician and songwriter. Upper right: Coornhert's second profession was a copper engraver; *Hendrick Goltzius 2003*: 158–160 no. 51; *Luijten 1993*: 233.
136
For the development of the intaglio printing press see Chapter 4, p. 286.
137
Three sketches by Leonardo da Vinci show designs for roller presses; *Meier 1941*: 496; *Reti 1974*, fig. 173/1.
138
Pantheo 1530: fol. 23r. The same illustration is copied in reverse in: *Pantheo 1550*, 2: fol. 15v.
139
De Caus 1615: fol. 2v; *Singer et al. 1954–1984*, 3: 45. Roller presses were also used by glaziers – not for producing lead plates but for pressing a profile in a strip of lead. The strips were bent around and the groove of the profile kept the pieces of glass together. The literature on the history of metal plate production is not quite clear in its use of the term 'rolling mill'. In modern parlance the term refers to a factory with heavy machinery running metal through large rollers until the required thickness of plate is reached. Today the term is also applied to sixteenth- and seventeenth-century metal factories, where the plates were most likely produced by hammer works.
140
Der Glasser, in Amman's book of trades shows a small roller press standing on the bench front left, the apparatus with the handle; *Amman & Sachs 1568*: fol. Giijr. *Hunnisett 1998*: 12–13; *Meier 1941*, pt. 3 (Oct.): 357–363.
141
Daumas 1965: 17, 257; *Halle 1761–1779*, 3 (1764): 188, Tab. IV, accompanying p. 188, fig. 4c.
142
Horovitz 1999: 66. Horovitz bases herself on 'wave' or 'ripple' patterns in copper plates used as paintings supports, patterns that seem typical for rolled copper. The power needed to compress a copper plate and the limitations of the wooden housing of the roller press would have restricted the possibilities of rolling copper in the seventeenth century, however. Whether the copper could be rolled while still hot, which would support the ripple pattern, needs to be considered. Alloying the copper with lead would make it softer and more malleable, but then it would become too soft for engraving; *Singer et al. 1954–1984*, 4: 128. For a discussion of the development of roller mills for sheet metal see: *Meier 1941*, pt. 3 (Oct.): 349–363.
143
Daumas 1965: 257; *Edlem von Keeß 1823*, 2: 26; *Stromer 1988*: 145–147. Presses for rolling copper plates are not depicted in the *Encyclopédie* by Diderot & D'Alembert, making an iron plate is done by hammering and the rolling mills illustrated are for lead plates; *Diderot & D'Alembert 1751–1781, Receuil de planches, troisième livraison* (1765)*, Forges ou art du fer*: 29–36, for the hammering of iron plates; *Diderot & D'Alembert 1751–1781, Receuil de planches, cinqième livraison, ou sixième volume* (1768), *Histoire naturelle. Metallurgie. Travail du fer blanc*, for the hammering of iron plates; *Diderot & D'Alembert 1751–1781, Receuil de planches, septième livraison, ou huitième volume (1771)*. See also: *Chopitel 1753. Laminage de plomb*, shows machines for rolling lead plates. The *Encyclopédie méthodique* states that there are two machines used in copper production, one for making flat plates and one for making concave objects; it goes on to describe hammering flat copper plates by an *assemblage des marteaux*; *Encyclopédie méthodique 1782–1832, Arts et métiers mécaniques*, 2 (1783): 121–125. See also: *Rémond de Sainte-Albine 1731*. Horovitz relates rolling mills for larger copper plates to the sheathing of ships in the 1760s; *Horovitz 1999*: 66; *Singer et al. 1954–1984*, 4: 579–580. Paul Revere invented rolling copper plates in the United States in 1801; *Cooper 1965*: 72 (without reference).
144
Buchwald 2008: 281–283, see also p. 322, fig. 276 no. 20.
145
Diderot & D'Alembert 1751–1781, Receuil de planches, troisième livraison [or fourth volume] (1765), *Forges ou art du fer*: 36–44; *Errard 1584*, tab. 29; *Swedenborg 1734*, 2: 252–254, pl. XXIX, XXX. Note that even the well-informed Swedenborgh does not mention rolling copper plates, thus it would still not have been common practice in his day. See also: *Singer et al. 1954–1984*, 4: 106–107. Rolling wrought iron plates is found later in the eighteenth century; *Singer et al. 1954–1984*, 4: 104.
146
In the early nineteenth century a copper ingot was hammered to a plate and cut to size; the resulting plate was made red hot and its thickness further diminished by running it through a roller press with steel rollers; *On Rolling Copper 1814*.

147
Lairesse (Amsterdam 1707): 377, on his personal experience that a heated copper plate becomes as soft as lead.

148
Looking at the Diderot illustrations for the rolling of lead plates this must have been a huge effort at the time given the large machines needed to flatten the soft metal; *Diderot & D'Alembert 1751–1781, Receuil de planches, septième livraison, ou huitième volume (1771). Laminage de plomb*. This means that if rolling soft metal was already cumbersome, cold-rolling of copper and iron was probably beyond the means of the period. To be considered is whether the copper plates produced in rolling mills, according to Prain (see above), were delivered to a coppersmith who hammered them further until the desired thickness and compactness were reached, after which the plates were planed and polished.

149
Thon discusses the differences between hammered and rolled copper, advising the latter; **Perrot** (Ilmenau 1831): 68. Lalanne preferred hammered to rolled copper because it was harder, more compact and worked better in etching; **Lalanne** (Paris 1866): 15.

150
Smith et al. 1951: 300–302, see the items 'Copper' and 'Zinc'; **Villon** (Paris, 2nd ed., 1914), 1: 35. Zinc plates were rolled at least by 1820; **Eberhard** (1822): 2.

151
Höhne & Rösling 1996: 109–110, Taf. 3 Fig. 8, Taf. 5 Fig. 3; **Perrot** (Ilmenau 1831): 67–69.

152
Stijnman 2 (De Bilt 1985): 71–72.

153
Bosse (Paris 1645): 69–71; **G.H.** (Nürnberg 1707): [7].

154
Bosse (Paris 1645): 53. See also: **Steel and iron facing** (1882): 111, col. 2, where the (electrotype) plate is sent to the planisher for bevelling.

155
For large mezzotints see below under 'Rocking machines'.

156
See Chapter 1, p. 26.

157
Bury 2010.

158
An early example and an archetype for the many that followed is *The Entry of Emperor Charles V and Pope Clement VII in Bologna on 24 February 1530*, etched by Nicolaas Hogenberg between 1530 and 1535, comprising (at least) 40 etching plates; *Hollstein Dutch & Flemish*, 9: nos. 31–70; *Hollstein German*, 13A: nos. 31–70; *Von Heusinger 2001*. The idea of a compounded print was not new, as it had been carried out with large images printed from woodblocks, such as for Dürer's *Ehrenpforte* of 1517/1518 measuring 3.5 × 3 m; *Hollstein German*, 7: no. 251, total size c.350 × 300 cm. Charles V had ordered Robert Peril to make a frieze in woodcut of the same entry in Bologna comprising 24 woodblocks and measuring 59 × 483 cm; *Von Heusinger 2001*: 105–108. For an introduction to early large format woodcuts see: *Appuhn & Von Heusinger 1976*; *Silver & Wyckoff 2008*.

159
Columna Traiani Imperatoris, drawn by Girolamo Muziano, etched by Leonardo Sermei, Roma: Bonefatio Breggi, 1576, HAB, XD-FM.4; *Bury 2001*: 50, 63–65, 68, 72; *Daly Davis 1994*: 128–129.

160
Giorgio Ghisi after Raphael, *The School of Athens*, engraving on two plates, 1550. *Bartsch*, 15: 394 no. 24. His *Disputa* of 1552 was even a little larger, measuring 52 × 84.5 cm; *Bartsch*, 15: 394 no. 23.

161
For information on paper formats see Chapter 4, p. 260.

162
There are exceptions. Johannes and Lucas van Doetechum after Hieronymus Cock, *The Funeral Procession of Charles V*, etching, 1559, c.10 m long, comprising 32 plates, the frieze was inspired by Hogenberg's *Entry*; *Hollstein Dutch & Flemish*, 4: 188 nos. 277–308. Frans Huys after Pieter Bruegel, *The Naval Battle in the Strait of Messina*, engraving on two plates, 1561, 43.4 × 71,7 cm; *New Hollstein Dutch & Flemish* (Pieter Bruegel the Elder): 115, 118, no. 48.

163
AKL, 21, 'Cort, Cornelis': 342; *New Hollstein Dutch & Flemish* (Cornelis Cort) 1: xxvi. A comparative study of the increase in size of plate formats in Italy and in the southern Netherlands in the sixteenth century would provide further details.

164
Cornelis Galle I engraved four or more smaller designs on one larger plate. He thought it was easier to send a larger plate instead of several smaller plates from Brussels to Antwerp, and asked Paulus Moretus to have the plate cut into its various designs before printing; information kindly supplied by Karen Bowen and Dirk Imhof.

165
See Chapter 4, p. 366.

166
Wadum 1999: 107.

167
See Fig. 101, p. 108: the man on the right (fig. 7) is negotiating with one of the workmen, who is holding a large plate (fig. 6) from which a rectangular piece has already been cut out. **Fokke** (Dordrecht 1796): 174; **Symonds** (London 1649–1659): fol. 164.

168
Ackermann 1841: [1]. See also Chapter 2, p. 107. **Engraved on steel** (1866) is an amusing story in Dickensian style about the production of a

portrait etched and dotted in steel after a photograph. The engraver, the 'dawdling Pickpeck', starts by ordering a steel plate, for which he has to wait several days. Today suppliers also offer plates in a standard format but it is still preferable to select plates personally in order to ensure equal sized plates.

169

Bosse (Paris 1645): 13.

170

Bosse (Amsterdam 1662): 8; *Janssen et al. 2010*: 141, 158; **Schoonebeek** (Amsterdam 1698): 8.

171

Note that these are not absolute measurements because the size of an inch, *zoll*, *pouce* or *duim* in millimetres varies between roughly 2 and 3 cm from place to place over time and the number of lines per inch varies from 10 to 13. Note furthermore that there is a strong repetitive element here, which either means that these sizes were indeed very common or authors are referring to each other. Study of available historical plates would give more detailed information.

172

Von Bartsch 1821, I: 2.

173

Hamerton (1875).

174

Moving such a plate through the press forcefully may cause the cutting of paper and felt at the plate edges; *Stijnman 1985*: 71–72

175

Hinterding 1995: 40–57; usually it concerns only small plates.

176

For his *Job* (1826), plate sizes are 16.5/17.2 × 20.0/22.0 cm with thicknesses varying from 1.00 to 1.60 mm. The plate sizes for *Dante* are 27.5/28.0 × 34.5/35.4 cm with thicknesses varying from 1.46 to 2.04 mm. See: *Bentley 2007*: 748–751, tab. 9.

177

Le Blanc 1854: 356; *Nagler 1835–1852*, 6: 139. The plate is printed on a single sheet of paper of 88 × 130.5 cm. See also Chapter 4, p. 260.

178

Perrot (Paris 1830): 27.

179

The plate is one of a series of seven extremely large plates, at least three of which are still kept by the Antiquarian Society; *AKL*, 7, 'Basire, James': 366; *Newington 1990/1991*; *Thieme-Becker*, 'Basire, James', 2: 598–599. Extra large paper to print the plate was manufactured by James Whatman Jr; *Hills 1988*: 72–73. For further details see Chapter 4, p. 260. Large size steel engravings were popular as wall decorations in the nineteenth century, a vogue that James Whistler strongly opposed. James McNeill Whistler, *Propositions*: 'V. That the huge plate, therefore, is an offence – its undertaking an unbecoming display of determination and ignorance – its accomplishment a triumph of unthinking earnestness and uncontrolled energy – endowments of the "duffer"'; *Black 2003*, inside front cover.

180

Information kindly supplied by Charles Morgan and Graham Scholes.

181

Information kindly supplied by Angela Walker.

182

I derived the term 'pre-shaped plate' from the term 'pre-shaped canvas' for modern paintings of a particular shape, other than rectangular, such as by Frank Stella. The term 'cut-shape plate' is standard.

183

See also above under 'Gold and silver'.

184

The plate Van Dyck used for his portrait etching of Paulus Pontius was irregular and too large, for which reason strips were cut off in the second and third states; *Depauw & Luijten 1999*: 126–130, pl. 12a–c. Prints by Pieter van der Borcht show scratches of sanding in the margins of the plate in its first state; the margins are cut in the second state; *Visser 1988*.

185

B. 23, *Selfportrait Leaning on a Stick with a Sabre*; B. 66-III, *Christ and Scribes*; B. 77-VII, *Ecce Homo*; B. 153, *Blind Tobias*; B. 158, *Sleeping Dog*.

186

See, for example, the Rimbaud series by Jim Dine, the concept changing with each version; *Field 1978*: 83–86. *Billard 1985*: 92–107.

187

See Chapter 4, p. 352.

188

See Fig. 101, p. 108: a plate polisher is working at left. See Chapter 2, p. 107.

189

Bosse (Paris 1645): 13.

190

Bosse (London 1662): 4-6; **Browne 2** (London 1669): 109–110.

191

Excellency (London 1668): 55. See also: *Miedema 1980*, 1: 314.

192

Filleau des Billettes (Paris 1693–1698): 112.

193

At first glance printed dents might look like dirty 'fingerprints' due to the series of round or oval conglomerates of scratches of the sanding stone not polished away from the bottoms of the dents. Examples can be seen in etchings by Anthony van Dyck: *Portrait of Adam van*

Noort (NHD 7-I), especially in the lower half; *Titian and his Mistress* (NHD 628-I) especially in the lower margin.

194

Janssen et al. 2010: 141, 158; **Schoonebeek** (Amsterdam 1698): 8.

195

Sanding the plate using different stones is mentioned by the following seventeenth-century authors: **Bate** (London 1634): 138–139; **Borch** (Zwolle 1635): fol. 1r; **Bosse** (Paris 1645): 13–15; **Browne 1** (London 1660): 36–37; **Browne 2** (London 1669): 108–109; **Brugghen** (Amsterdam 1616): fol. D3r; **Filleau des Billettes** (Paris 1693–1698): 110–112; **Schoonebeek** (Amsterdam 1698): 8–12. Schoonebeek also illustrates the process: *Janssen et al. 2010*: 141–143, figs 1, 2.

196

See also: *Perspective practique 1642–1647*: pl. on pp. [9], [11], the engraver on the right has a burnisher on his desk.

197

Filleau des Billettes (Paris 1693–1698), the plate with the engravers, fig. N.

198

Diderot & D'Alembert 1751–1781, *Receuil de planches, quatrième livraison, ou cinquième volume* (1767). *Gravure en taille douce, suite de la planche* 1: fig. 20; *Halle 1761–1779*, 1 (1761), Tab. VII, accompanying p. 222, fig. 4.

199

Bosse (Paris 1645): 15.

200

Francis (1842), 3: 174–75; *Short 1904* (ed. 1914): 5–6, item 4 has 'Materials for polishing plates'.

201

See above under 'Hammering and rolling'.

202

The engraving and plate printing establishment of Felsing in Berlin obtained a machine for planishing steel, copper and zinc plates in 1850 and also prepared plates for others; *Gerhardt 2006*: 115. Special polishing powders were offered in the nineteenth century; **Vogel** (1855–1856).

203

See Chapter 4, p. XX.

204

Berthiaud (Paris 1837): 211; **Bosse** (Paris 1645): 64; **Bosse** (Paris 1745): 148; **Dossie** (London 1758) 2: 202–203.

205

Schwarz (Nürnberg 1805): 95.

206

Discoloration (Berthiaud calls it *plomber*) of copper plates, electrotypes and steelfaced copper plates due to vermilion in the printing ink was reported in the nineteenth century; **Berthiaud** (Paris 1837): 203–205; *Laurens Coster 1865*. '[Artificial] ultramarine often contains free sulphur which corrodes and blackens copper intaglio plates'; *Apps 1958*: 186. For the removal of oxidation products see: *Lage de la Rosa et al. 1992*; *Nottingham 1997*.

207

Bosse (Paris 1745): 148; **Dossie** (London 1758), 2: 203; *Voit 1786–1790*, 2: 102, explains how the plate is coated with oil or fat, oil being better.

208

Foden 1996: 23. Copper plates on display are usually cleaned, inked with black oil-based intaglio ink, wiped and left to dry. The plates are covered with a removable fully transparent alcohol-based lacquer. This shows black grooves contrasting with the shiny copper background. According to Hedges, storing the plate for some time causes oxidation of the metal. He states that this oxidation is removed 'by scouring and polishing of the plates prior to each print run', although he does not give any details. In his view, this removal of corrosion accounts for the loss of material and the wear of the plate. 'Scouring and polishing' does indeed remove material and this manner of cleaning is performed in some printshops, but there is more. He does not consider abrasion of the plate due to inking and wiping, nor does he take into account variations in the ink formula, the volume and dampness of the paper, the manipulation of the ink during wiping the plate, the method of wiping, the thickness, kind and quality of the felt blanket, the amount of water in the felt, the pressure during printing, and the re-engraving or re-etching of a worn plate – all of which influence the appearance of the print and thus the lines he measures in his system; *Hedges 2006*; *2008*.

209

The metal transforms at 13.2°C and below.

210

See Chapter 1, p. 52 and Chapter 4, p. 331. Rust stains may even guarantee a late impression, or at least not a 'vintage' print. Nevertheless, care should be taken in dating prints on the basis of the amount of rusting visible because the iron may have rusted quickly therefore it already shows in early impressions or the plate may have been kept well protected for a longer period so the rust is apparent only in later impressions. Even the amount of rust cannot indicate the plate's age because a skilful engraver with enough 'elbow grease' would be capable of removing corroded areas to a certain degree and a skilful printer may clean out most of the corroded areas of a plate.

211

Berthiaud (Paris 1837): 212: 'within 48 hours'.

212

Notice (1822).

213

Turner (1824): 57.

214

About protecting steel plates (1821 or 1822); **Berthiaud** (Paris 1837): 211–216; *Short 1904* (ed. 1914): 17, item no. 78. The printing house of McQueen, London, coated its steel plates with beeswax later in the nineteenth century. Their plates are now held by Thomas Ross &

Son, London, who use Japanese laquer instead of beeswax; *Hunnisett 1980*: 52. The Japanese lacquer is supposed to contain free fatty acids, however, which could cause corrosion. Personal correspondence with paper conservator Barry Knight in 2006.

215

Chamberlain (London 1972): 179; **Ligeron** (Paris 1924): 167; **Maxwell** (Englewood Cliffs, NJ, 1977): 108; *Rouveyre 1911*: 15. Rubbing a plate with petroleum jelly (Vaseline) and next wrapping the plate with clingfoil (thin plastic foil) works well. Chamberlain uses greaseproof paper for this purpose.

216

Cejka 1975.

217

Carol Robertson, head of a printshop in Edinburgh recommends Lascaux resists.

218

For chromefacing see above under 'Steelfacing'. Plating with gold would also be possible.

219

Prints by Hercules Segers that show lines of the original (the big ship), Hercules Segers, HB 18, 17, 21 *Rowlands 1979*: 29, 34–35 nos. 19, 23, 54.

220

Buonaccorsi (Ravensburg 1916): [1], recommendation for Renner in Munich who replanished and polished old plates; **Hamerton 3** (1875); *Larson 1985*: 5; *Thieme-Becker*, 9: 261.

221

Cooney 1996: 43; **George** (1857); **Roller** (Wien 1888): 117–118; **Thorstensen** (Oslo 1946): 133–137. The density of the filled lines will be less than that of the plate itself. The difference in density makes the plate unsuitable for engraving, while in etching less denser areas will etch faster and thus show wider lines.

222

See also Chapter 1, p. 25.

223

Illustrated Bartsch, 30 (1980): 33–34, show the dented versos of hammered copper plates engraved by Agostino Carracci; *Landau & Parshall 1994*: 24, fig. 6.

224

Bentley 2007: 761–767; *Hinterding 1995*: 9, fig. 2, 3; *Landau & Parshall 1994*: 24, n. 118 & fig. 6; Ruusbroec Genootschap, Antwerpen, copperplate Kp. 7. The second sanding would considerably thin the plate.

225

See Chapter 4, p. 335.

226

Short (London 1888): 20. For further details concerning re-biting see below under 'Etching methods'.

227

Enfield (London, 2nd ed., 1822): 307.

228

For further discussion about restrikes, re-engraving plates and the maximum number of plates see Chapter 4, p. 331.

229

Hinterding et al. 2000: 290–292.

230

A typical example is Rembrandt who etched a portrait of the preacher Jan Cornelis Sylvius (B. 280) and had text engraved around and underneath the portrait.

231

Heenk 1997; *Roy & Smith 1998*: 137; *Wittenberg 1998*.

232

Goltzius engraved several gold and silver medals, which were also printed, perhaps as souvenirs or mementoes for the family of the sitter; see above under 'Gold and silver'.

233

Bock 1864. Interest in such materials developed from the late eighteenth century. An early example is a copper or brass decoration plate depicting the Virgin, Child and a kneeling abbot, signed 'Wolfgangus Aurifaber // 1477'. The plate itself was printed shortly before 1800, the texts showing in reverse, of course, and an etching of the plate was made, also in reverse; *Andresen 1864–1878*, 2 (1873): 748; *Thieme-Becker*, 36: 220; *Von Bartsch 1802–1821*, 10 (1808): 16.

234

See below under 'Collagraph'.

235

Adeline (Paris 1894): 21; **Stauffer-Bern** (Dresden 1907): 129; **Ziegler** (Halle, 2nd ed., 1912): 26. Note that Georg Baselitz creates his imagery upside down.

236

Bosse (Paris 1645): 18; **Método** (1993): 268, col. 3.

237

The following paragraph is a reworked version of *Stijnman 2004*. For a discussion of drawings for transferring print designs see: *Leeflang 2003*: 22 who reviews recent literature on the subject; *Von Heusinger 1987*. With thanks to Katharina Mähler and Emily Gray for reviewing this paragraph. In most cases transferring the design onto the plate would have been performed by the engraver himself, as all references refer to the engraver or etcher. It is a stage in producing the printing plate that needs to be done with care and would only have been carried out by an assistant for less important works.

238

For discussions on traditional transfer methods used by draughtsmen and painters see: *Bambach 1999*: 296–330, notes on pp. 478–487; *Bomford 2002*: 61–73, notes on pp. 185–186; *Scheller 1995*: 70–77. On the use of transfers by mediaeval goldsmiths see: *Fritz 1966*: 390–397. Cennino Cennini (ante 1400) describes tracing an image; *Cennini 1960*: 13.

239

For an eighteenth-century overview see: **Dossie** (London, 2nd ed., 1964) 1: 385–404.

240

However, if the etcher first traces the lines of the drawing on the ground with a needle, the needle moves through the ground and scratches the plate. If the etcher changes his mind before biting and covers lines with stopping-out varnish, these lines will show as light drypoint lines in the print.

241

Engelbert Kaempfer complained that he supplied the engravers who made the illustrations for his work on Persia with his own accurate designs in various sizes but because of their lack of skill and 'sheer ignorance' (*botte onweetendheid*, Bruin; *rudes & morosi ingenii*, Kaempfer) the plates are full of mistakes; *Bruin 1714*: 31–32; *Kaempfer 1712*: fol. c1r–v.

242

Cooney 1996: 39–40, includes more modern methods. The technique must have been known before 1500 because some drawings by Dürer dating to the early sixteenth century show such indentations; unless they were traced by others later. References to the designs for B 1 (1504) and B 36 (1519); *Fritz 1966*: 390–391.

243

Diderot & D'Alembert 1751–1781, Receuil de planches, *quatrième livraison, ou cinquième volume* (1767). *Gravure en taille-douce, en manière noire, manière de crayon, &c*, pl. III, figs 1–3.

244

This particular technique is not found in any source, but reconstructions showed that the method is suitable for ink drawings.

245

Description in **Hassel** (London 1826): 14; *Voet 1969–1972*: 218, n. 2, same drawing as above.

246

Edlem von Keeß 1823, 2: 29.

247

For a discussion about *pentimenti* in relation to replicas and copies see: *Landau & Parshall 1994*: 131–146.

248

Depauw & Luijten 1999: 275, 278, fig. 38a; *New Hollstein Dutch & Flemish* (Anthony van Dyck): no. 547-I.

249

Bosse (Paris 1645): 16, 42, pl. 1; **Fokke** (Dordrecht 1796): 196, 274–276, pl. VI, advises cutting the wick of the candle otherwise it may damage the etching ground; *Janssen et al. 2010*: 148, 161, fig. 9. Instead of wax a pitch candle may also be used. Candles made of animal fat (tallow, stearin) do not produce enough soot to blacken the ground.

250

Alken (London 1849): [1], in the middle; **Ashley** (London 1849), pl. between pp. 2 and 3, fig. 14; **Deleschamps** (Paris 1836), pl. 1, second row in the middle; **Jacque** (1852): 292, fig. 10 and p. 333, fig. 19; **Meynier** (Hof 1804) *Tab*. II, *Fig*. 3; **Perrot** (Paris 1830), pl. 1, fig. 17; **Schwarz** (Nürnberg 1805), *Tab*. II, *Fig*. 5. Twisted wicks are commonly illustrated by the middle of the nineteenth century. Hamerton advises placing a piece of metal gauze between the flame of the candle and the plate to prevent burning of the ground; **Hamerton 2** (1870).

251

Berger 1901, British Library, Ms. Sloane 2052 (1620–1646?): fol. 35r (white crayon), fol. 37v (red crayon).

252

Ziegler (Halle, 2nd ed., 1912): 26.

253

Book of drawing (London 1679): 21; **Bosse** (Paris 1745): 93–95; **Browne 2** (London 1669): 105; **English academy** (London 1672): 26; **Excellency** (London 1668): 50–51.

254

Antwerpen, collection of the Rubenshuis; for further discussion and an illustration of the recipe see: *Stijnman 1999*: 32. *Magurn 1991*: 87–88, especially p. 88.

255

Bosse (Paris 1645): 9.

256

Faithorne gives both, the first being a mixture of lead white and 'Flanders Starch' (pp. 29–30), the second lead white mixed with a gum solution (p. 38); **Bosse** (London 1662): 29–30, 38. The lead white and gum mixture was described by Browne two years before Faithorne. Browne also gives a mixture of red chalk and 'gum water'; **Browne 1** (London 1660): 32.

257

Hamerton (London 1871): 33–34, prescribes 'silvering' a plate with cyanide of silver, and using a saturated solution of wax in ether; **Herkomer** (London 1892): 23–25, recommends 'grease-paint' in sticks that actors use to whiten their faces; **Netto 1** (Dresden 1815): 5; **Reed** (New York 1914): 77–80, refers to working with a white ground as a 'Positive Process'; **Schwegman 1** (Haarlem 1793): 5–6; *Senefelder 1818*: 336–337; **Ziegler** (Halle, 2nd ed., 1917): 150–151.

258

Art of drawing in perspective (London, 3rd ed., 1769): 59; **Bate** (London 1634): 141; **Browne 2** (London 1669): 105. From one of the English treatises it was copied in Dutch: **Fokke 3** (Leyden 1805): 64.

259

Cennini 1960: 13–14. For recipes for gelatin sheets for transferring see: **Evelyn** (London 1726): 111–113; **Perrot** (Ilmenau 1831): 75–83.

260

Impregnating paper with oil or fat only makes it semi-transparent. The greasy paper may also stain the original and pick up crayon particles of the original drawing in the tracing.

261
Pouncing was applied as a transfer method in the Middle Ages in Europe, as well as for ninth-century wall paintings in China. Pricked designs are found regularly in mediaeval imagery, but whether they are contemporary is disputable; *Bambach Cappel 1996*: 378–379. An early example is in the fifth-century Ashburnham Pentateuch (Tours), although the pricking may have been carried out sometime in the following centuries; *Narkiss 2006*: 27, fig. 2. Pouncing was used to transfer designs for illumination and decoration in manuscripts, but also to transfer designs onto textile. The difference is in the size of the punctures – textile is coarser and thus needs bigger holes. For tenth-century Chinese examples see: *Bambach Cappel 1996*: 378; *Tsien 1985*: 147. I saw an eighteenth-century Indian example in the National Museum of India, New Delhi, in 2008, inv. 47.110-1085.

262
Een print heel correct sonder veel moejte (al kan men niet teyckenen) na te etsen; **Overbeeke** (Amsterdam 1650–1700): fol. 25v.

263
Primeau 2009; **Fokke 2** (In den Hage 1804): 58, describes copying a print by means of pouncing in order to make a drawing.

264
Tempesti (Firenze 1994): 148. The technique is ancient – Egyptian examples date back to the fifteenth century BC; *Peck 1978*: 35, 76, 104, 195; *Scheller 1995*: 91–93.

265
Hassell (London 1826): 14–15, pl. opp. p. 15; **Salmon** (London, 4th ed., 1678): 36 with fig. opp. When the proportions of the squares are changed for the copy, converting the squares into rectangles (portrait or landscape format), we enter the field of the anamorphosis; *Mazzocchi & Pintacuda 2009*: 73–75, figs 57–58. Copying the lines per square still demands drawing skills. Cochin therefore refers to the use of a pantograph to reduce, enlarge or copy drawings, for those who are less proficient in drawing; **Bosse** (Paris 1745): 60.

266
See the person in the background on the right of the interior of the female engraver in her studio in: *Choffard 1804*: 15, fig.; *Gramaccini & Meier 2003*: 51, *Abb*. 3.

267
Bosse (Paris 1745): 58–60; **Dossie** (London 1754) 2: 105–107; The *Encyclopédie* refers to this in the phrase *on a calqué ou 'contre-tiré' sur la planche vernie*; *Diderot & D'Alembert 1751–1781, Receuil de planches, quatrième livraison, ou cinquième volume* (1767). *Gravure, en taille-douce, en maniere noire, manier de crayon, &c*: 3, text accompanying pl. II, fig. 13. In this way the offset on the plate is a reverse of the original therefore the print will match the original. In order to reverse the image in the print, the drawing or tracing is first offset on a sheet of paper and then this offset is counterproofed onto the plate.

268
Hassell (London 1826): 15; **Steel** (London 1938): 35–36; *Short 1904* (ed. 1914): 6, item 9. Offset drawings – either for copying in print or to make an *Abklatsch* on another sheet of paper – done in red crayon can be recognised by the typical faint, orange-like hue of the crayon lines.

269
Aangename tijdkorting 1814: 41–42.

270
Short 1904 (ed. 1914): 6, item 10.

271
Roller (Wien, Leipzig 1888): 45–46.

272
Buonaccorsi (1913): 7; **Ziegler** (Halle an der Saale, 2nd ed., 1912): 143. See also: *Oberli 1968*: 83.

273
For the technique and use of counterproofing see Chapter 4, p. 321.

274
See Chapter 4, p. 335*.*

275
Van Ranouw 1721: 59.

276
Afdruk maaken (1799); *Griffiths 1997-2*; **Liebhaber 2** (Nürnberg 1703): 338 no. 26; **Plate printing** (1849). In the same way images and texts can be offset onto any other surface; **Dossie** (London, 2nd ed., 1764): 397–398; **Fokke 2** (In den Hage 1804): 58–59; **Liebhaber 1** (Nürnberg 1696): 537–538; *Oeconomische courant 1799–1803*, 1(13): 100; **Schad** (Nürnberg 1800): 104–105. Böttger invented a method that made use of the salts present in Frankfurt black, the pigment always used in intaglio ink, whereby the offset is not black but dark blue because of the chemical reaction between the salts and an iodine starch salt; **Böttger 1** (1861).

277
Le Blon (Paris 1756): 93–96; **Rueda** (Madrid 1761): 172–175, pl. 12. For Le Blon's colour printing method see Chapter 4, p. 359.

278
The oxgall prevented the reticulation of the watercolour on the fatty surface of the oil paint. Note that placing the frame with the gauze face down upon the original is not described in so many words by Le Blon, but it can be deduced because the lines in oil paint have been traced.

279
Baudin (1803); **Le Blon** (Paris 1756): 96–97.

280
Verheijden (Den Haag 1736–1739): 150–151.

281
Examples are found in the work of Felicien Rops and Georges Rouault, see below under 'Artists' reactions'. Designs were

photomechanically transferred onto printing plates for cartography from at least the 1920s; *Oberli 1968*: 83.

282

For further details see below under 'Photomechanical techniques'.

283

Voet 1969–1972, 2: 218. For the engraving by Andreas Pauli (Pauwels) see: *Hollstein Dutch & Flemish*, 17: 11 no. 20.

284

Bosse (Paris 1745): 57–58, 61; **Dossie** (London 1754) 2: 107–109; **Radir- und Aetzkunst** (Halle 1796): 4. Similarly, he could offset the original drawing or a tracing of the original drawing (see above: 'Offsetting'). See also: **Perrot** (Ilmenau 1831): 44. Overbeeke is even quite specific when he discusses pouncing a print to copy it: the impression of the copy will be in reverse. If you do not want that you have to turn over the original and work from the back. In order to see the design on the other side better you oil the print to make it more transparent; **Overbeke** (Amsterdam 1650–1700): fol. 25v.

285

Referred to by Bosse and Dossie, see above note. **Adeline** (Paris 1894): 21; **Cröker** (Jena 1736): 288; **Longhi** (Barth; Hildburghausen 1837) 2: 38–40, *Taf*. 1 no. 8; **Stauffer-Bern** (Dresden 1907): 129–130; *Von Bartsch 1821*, I: 7. Wille noted in his diary for 9 June 1764 that he did not use a mirror in engraving plates that required mirror-imaged engraving in order to print correctly, although others did; *Duplessis 1857*, 1: 258. The painter Bachelier invented an (unknown) instrument for reversing the design without the disadvantages of using a mirror, such as the loss of brightness and the doubling of lines; *Courboin 1914*: 37. Letter engravers were trained to engrave the complete text in mirror image, just as typographic printers set text mirror-imaged; *Diderot & D'Alembert 1751–1781, Recueil des planches, quatrième livraison, ou cinquième volume*, (1767). *Gravure en lettre, en geographie et en musique*, pl. 1.

286

For the same reason counterproofs were used to check and correct the printing plate. For counterproofs see Chapter 4, p. 321.

287

Bosse (Amsterdam 1662). García Hidalgo advises using transparent paper or a mirror to reverse the original design or holding the original against the light; **García Hidalgo** (Madrid 1693): 10; **García Hidalgo** (Cambridge 1986): 138.

288

Bosse (Paris 1745), pl. 19.

289

On avertit que l'ancrier e le gril doivent être à droite, et la table à essuier à gauche.

290

Bosse (Dresden 1765), pl. 19; *Diderot & D'Alembert 1751–1781, Receuil des planches, sixième livraison, ou septième volume* (1769). *Imprimerie en taille-douce*, pl. I.

291

Liebhaber 2 (Nürnberg 1703): 338 no. 26.

292

Wölfflin 1941. See also Wölfflin's next article in the volume *Das Problem der Umkehrung in Raffaels Teppichkartons*: 90–96, which discusses the problem of mirror image in tapestry woven from the verso side.

293

The drawing is in the Musée des Beaux-Arts (Lille) and the painting in the Musée du Louvre (Paris); *Le Pichon 1993*: 118–119.

294

The majority of reproductive prints until 1800 are the reverse of their originals; *Gramaccini & Meier 2009*: 57; *Keller 2009*: 49.

295

Vogt 2008: 95–107; with further references to the topic. See for instance: *Meder 1932*: 42–43.

296

Strauss 1977: 54–61

297

Keller 2009: 54–55.

298

Von Bartsch 1821, I: 7.

299

See: *Gaffron 1950-1*, who registers 34 cases of reversed subjects. Examples of the use of a right as well as a left hand in one plate are: B. 29, 114, 116. For further discussion on the topic see: *Boeck 1953*; *Gaffron 1950-2*; *Held 1980*; *Hinterding 1996*; *Roosen-Runge 1951*. The Rembrandt House Museum, Amsterdam, expressed interest in this discussion in its exhibition 'Rembrandt gespiegeld, een blik in het brein van de meester' from 10 December 2009 to 21 March 2010; *Nieuwsbrief Museum Het Rembrandthuis & Vereniging Vrienden van het Rembrandthuis*, no. 10 (8 Dec. 2009); *Van de Wetering 2009*; *Van den Boogert 2009*.

300

B. 285; *Hinterding et al. 2000*: 235–242. See also the *Portrait of Jan Cornelisz. Sylvius* (B. 280); *Hinterding et al. 2000*: 223–227.

301

Robinson 2008. In this case the matter of whether or not to reverse is less important.

302

Hinterding et al. 2000: 243, n. 6.

303

After all, a woman looking in the mirror might observe herself critically, but she will accept without complaint that her left side is on the right and her right side on the left.

304

Flocon (Paris 1952); **Kosch-Görlitz** (Wien 1932); **Robert** (Henri; Paris c.1900); **Steel** (London 1938). Cröker just referred to Bosse; **Bosse** (Paris 1645): 49–53, pl. 9–10; **Cröker** (Jena, 3rd ed., 1736): 292.

305

Lumsden (London 1925): 47; Wollaston tested various points for drypoint around the middle of the nineteenth century; **Wollaston** (c. 1860).

306
'Widia' is cemented tungsten carbide (WC or W₂C).

307
Ward (1997). For knife-shaped drypoint needles suitable for scratching straight lines, see: **Buonaccorsi** (1913): 6–7.

308
Dake (Amsterdam 1894): 12; **Delâtre** (Paris 1887): 18 (*noir gras*); **Hamerton** (1866): 297; **Reed** (London 1914): 118; **Smith** (Allen; Ramsbury 2004): 88. Compare with rubbing the plate with oiled black felt during engraving; see below under 'Engraving'.

309
See above under 'Transferring the Design'.

310
Bowles (London 1760): 30; **Castle** (London 1849): 30; **Compendium** (London 1797): 186; *Edlem von Keeß 1823*, 2: 31; **Francis**, 3 (1842): 383; **Imison** (London 1785): 58; **Partington** (London 1835): 101; **School of arts improv'd** (Gainsbrough 1776): 64; *Von Bartsch 1821*, I: 11–12.

311
Von Bartsch 1821, I: 11–12. For a similar procedure see: **Dake** (Amsterdam 1894): 12.

312
Edlem von Keeß 1823, 2: 30.

313
Typically copper particles may be found in the earliest impressions of a drypoint on a copper plate.

314
See Chapter 4, p. 331.

315
A typical example of a publication for which the author himself has scratched the illustrations in copper plates is: Johann Valentin Andreae, *Collectaneorum mathematicorum decades XI., centum & decem tabulis aeneis exhibitae*, Tubingen: Cellius, 1614.

316
See Chapter 1, p. 30.

317
White 1969: 10. Examples of Segers's prints with additional drypoint: HB 6 IId, e, 7 Ia (2nd state), 8a, 9 IIb, 10 Ia, d, 11, 13 IIIo, p, q, 15 IIb, 17 IIb, 19a, b, c, 21 IVe, 27 IIp, 29a, b, c (drypoint is not observed in d and e), 29f, 30, 31a.

318
Examples of Rembrandt prints with additional drypoint or drypoint only: B. 40, B. 75, B. 76, B. 78, B. 104, B. 107, B. 110, B. 203, B. 217, B. 221, B. 222, B. 236, B. 237.

319
Menpes 2 (1890).

320
Lalanne (Paris 1866): 48–50.

321
See drypoints by Edgar Degas, Édouard Manet and Marcellin Desboutin of the 1870s. They were followed by Mary Cassatt, Berthe Morisot and Pierre-Auguste Renoir in the 1880s and 1890s.

322
Steel (London 1938): 36. Steel also used common etching ground instead of wax.

323
For a demonstration showing all stages of engraving and printing a copper plate see: http://www.risdmuseum.org/thebrilliantline/ (2010), click on 'Explore', click on 'Watch video'.

324
For early burins see Chapter 1, p. 28.

325
A second sort, with the cutting end of the shaft turned up a little, was used to engrave decorations in metal objects but not for engraving printing plates; **Bate** (London 1634): 137, with fig. A straight and a curved burin are observed bound together in a bundle of artists' tools at the middle of the left edge in: *Seutter 1584*, engraved titlep.

326
Von Bartsch 1821, I: 5–6.

327
A 'scorper' is called *échoppe* in French; *Diderot & D'Alembert 1751–1781, Receuil de planches, quatrième livraison, ou cinquième volume* (1767). *Gravure en medailles*, pl. III, figs A, C; *Gravure en cachets*, pl. II no. 16; *Gravure en lettres, en géographie et en musique*, pl. I, D and its grooves g, h, i. Roubo refers to engravers for decorating metal who use the same tools as engravers of printing plates; their *échoppe* is a burin with a more or less flattened belly, due to which the tip can cut a wide and squared groove; *Roubo 1977*, 3: 1017–1018. This term should not be confused with the round etching needle with obliquely cut end of the same name; see below under 'Drawing'.

328
Fokke (Dordrecht 1796): 279 & pl. VI, fig. 11; **Steel** (London 1938): 8–9, fig. 3.

329
Vasari 1568, 1: 64, 294. The use of a burin for engraving non-precious metal objects is commonly found, but never documented in this early period.

330
Fokke describes the front part as being four inches (*duim*) long and the back part an inch and a half; **Fokke 1** (Dordrecht 1796): 193. Netto

explains that the best burins have a slightly curved shaft; **Netto 1** (Dresden 1815): 35. **Profit** (Paris 1913): 28, fig.

331
Bosse (Paris 1745): 99, the best steel comes from Germany. This is copied in: *Chomel 1778*, 5 (1778): 2719, col. 2.

332
Fokke 1 (Dordrecht 1796): 191.

333
A too hard a tip may be made 'as hard as a diamond' and break 'as glass', which is not desirable for copper engraving; **Bosse** (Paris 1645): 52; *Buchwald 2008*: 463–464; *Chomel 1778*, 5: 2720. **Excellency** (London 1668): 54, comments on hardening and has a test for hardness. **Compendium** (London 1797): 50–51, states that burins 'are usually too hard as sold in the shops'. **Hodson 2** (London 1805): 122, repeats and explains this: 'Gravers, as sold in the shops, are generally too hard for use, which may be known by the frequent breaking of their points', thus need to be tempered, for which directions are given.

334
Hayter (London, 2nd ed., 1966): 32; **Hübener** (Leipzig 1916): 39; **Neubert** (Leipzig 1921): 5–6; **Steel** (London 1938): 10.

335
Chomel 1778, 5: 2720.

336
Olive oil was used for honing his burins and for scraping his plates, while a mineral oil is used today; both kinds are non-drying, so do not clog the grooves and can always be removed. For information on oils see Chapter 4, p. 267. **Bosse** (Paris 1645): 49–50, pl. 9. This information is found in all later editions, but other authors rarely pay attention to it; **C.I.C.A.L.C.** (Nürnberg 1728): 799–800; **Fokke 1** (Dordrecht 1796): 193. Interiors of engravers' studios commonly show one or two honing stones on the work bench. The printmaking world changed dramatically in the nineteenth century with a consequent loss of knowledge. German master engraver – not of printing plates but of metal decorations – Neubert complained about the poor skills exhibited by students preparing their tools and offered his services; **Neubert** (Leipzig 1921): [2] at the back.

337
Billard 1985: 14, 16–17.

338
Artist's assistant (London, 2nd ed., 1785?): 196. Bosse does not specify the kind of stone used: *une bonne pierre*; **Bosse** (Paris 1645): 50.

339
Commonly just a few strokes are seen; *Phillips 2005*: 148, fig. 56. Ruusbroec Genootschap, Antwerpen, copperplate Kp. 83 verso. Agostino Carraci, *Adoration of the Magi*, 'Agostino's seven plates for this engraving have been preserved in the Calcografia Nazionale in Rome. On the verso of plates 5 and 7 (see ills.), Agostino scribbled a few experimental forms, including hands, faces, and sections of crosshatching'; *Illustrated Bartsch*, 39 (1980): 30, the backs of the plates are reproduced on pp. 33 and 34.

340
Turrell 4 (1825)

341
Gill 1 (1823); **Gill 2** (1825). With a steel alloyed with rhodium, the latter metal improves hardness, closeness and toughness of the steel; *Ure 1853*, 2: 554.

342
Von Bartsch 1821, I: 5. Observation of Basil Hunnisett; personal correspondence, 2006. The shafts of Theophilus's burins were 'as long as the middle finger' (*longitudine maioris digiti*) or 8–10 cm.

343
Bate (London 1634): 136; **Bosse** (Paris 1645): 51, pl. 10. The image is often copied after Bosse. The majority of copper engravers depicted at work handle burins with their right hands. The exception is the engraver in Stradanus's workshop (c.1591) who engraves with his left hand. Perhaps this is done deliberately for reasons of composition because the three other people depicted working with one hand all use their right hands; *Sculptura in aes*, Hans (II) Collaert after Johannes Stradanus, c.1591, engraving. Fokke makes a casual remark about left-handed engravers; **Fokke 1** (Dordrecht 1796): 193–194.

344
See Chapter 1, p. 30. Map engravers used punches to hammer circles into the plate to mark towns; *Cooney 1996*: 35.

345
Bosse (Paris 1645): 37, 51–53, pl. 9–10.

346
Goltzius's portrait of Philips Galle shows, in the lower right corner, a burin with a double facet; the last part of the shield is cut at a steeper angle than the rest; Hendrick Goltzius, *Detail of the Portrait of Philips Galle*, 1582, engraving. Bosse shows the tip of the burin as cut and sharpened at an angle of 45 degrees; **Bosse** (Paris 1645): 9, figs II, IIII. Tempesti illustrates more varieties; **Tempesti** (Firenze 1994): 153–157. Cochin let it be known that because engravers all had their preferred shape there was no further need for discussion: **Bosse** (Paris 1745): 100.

347
Tempesti (Firenze 1994). A similar manuscript is the compilation of notes on printmaking and especially engraving by Joseph Hecht written between 1927 and 1931; **Hecht** (1994): 19, 72–91.

348
Bosse (Paris 1745): vi–vii, x, 97–117, pl. 10–11; **Le Comte** (Paris 1699–1700), 1: 144–156, at front.

349
Diderot & D'Alembert 1751–1781, *Receuil de planches, quatrième livraison, ou cinqième volume* (1767), *Gravure en taille-douce, en manière noire, manière de crayon, &c*, pl. I, I (*suite*) and III. Copied among others by: **Fokke** (Dordrecht 1796): pl. VI–IX.

350
G.H. (Nürnberg 1707).

351
Guélard 1743, pl. LXI: 122.

Perrot (Paris 1830). The text is not so much a manual on etching and engraving as a compilation of works by a large number of authors, as explained in the title, many of which are referred to. With every new edition more references were added. It therefore reflects the state of affairs of the period in which it was published.

353

Dubouchet (Paris 1891): 21–33.

354

Robert (Henri; Paris c.1900) is on musical annotation, while **Kosch-Görlitz** (Wien 1932) and **Steel** (London 1938) are the first true monographs on the subject. **Flocon** (Paris 1952) is a monograph, too, that places emphasis on design concepts. See also **Richomme** (Paris 1829). **Peterdi** (New York 1959): 1–41 has a thorough introduction to the subject. *Cooney 1996* describes details for map engraving.

355

See Chapter 2, p. 96.

356

Hendrick Hondius I, *Vanitas*, 1626, engraving, the object underneath the copper plate in the lower left corner is not clearly discernable, but it might be half a sphere. *Tirocinia artis = Clare Teekenspiegel*, Joannis Gellée (Johannes Gelle), 1639, see the title plate with a sphere (?) underneath the plate below middle and underneath the plate of the engraver middle right, see pl. 24 the sphere underneath the plate of the engraver on the right. *Perspective practique 1642–1647*, 1: [9], [17] and 2: [11] front, see the etching with seven professions with the engraver second from the right – what could be a sphere is underneath the plate.

357

Pieter de Jode the Younger after Anthony van Dyck, *Portrait of Pieter de Jode the Younger*, 1630–1640, 26.3 × 18.5 cm (plate sizes). A variety is found with the tools left by Thomas Bewick, the eighteenth-century wood engraver. He used a 'leather-covered lead casting' in the form of a sphere cut in half; http://www.bewicksociety.org/galleries/techniques.html (2010).

358

Wagner et al. 1979: 223. For reproductions see: *Landau & Parshall 1994*: 25; *Wolters 2006-1*: 279, fig. 14.

359

Otto van Veen's painting of his family shows on the right his younger brother Gijsbert with a burin in his right hand and a copper plate in his left. The left hand leans on top of some undefinable object, which could be a piece of cloth or perhaps even some kind of cushion; Musée du Louvre, inv. no. 1911; *Stijnman 1999*, fig. 5.

360

Bate (London 1634): 136–137.

361

Bosse (Paris 1645): 52, fig. 10. The leather pillow can also be seen with the engraver on the right in his *Atelier des graveurs* of 1643.

362

Respectively c.13 × 4 cm and 20 × 5 cm; **Cröker** (Jena 1736): 289–290.

363

About 15 cm square and 7.5–10 cm thick; *Chomel 1778*, 5: 2720.

364

Fokke (Dordrecht 1796): 196, the cushion could be filled with sand or with hair. Two leather cushions are mentioned in the 1680 inventory of Tempesti's workshop; **Tempesti** (Firenze 1994): 47.

365

Lairesse (Amsterdam 1707): 374–375: *de plaat legt niet vast, maar op een bol of zandkussen*. The auction catalogue of the inventory of Cornelis Dusart mentions 'a small sphere on a small pedestal' (*een Cogeltje op een Pedestaaltje*) with the utensils of his studio; *Catalogus 1708*: fol. C2v, item no. 486.

366

Alois Kosch-Görlitz (Wien 1932): 51, fig. 21.

367

Cröker (Jena 1736): 290.

368

Bosse (Paris 1645): 52–53. Bosse mentions, but does not describe or illustrate, the scraper. The German edition (Nürnberg 1652: 89) translates *avec la vifue areste* as *mit einem scharffen Eysen*, 'with a sharp Iron'. The Dutch edition (Amsterdam 1662: 80) translates this as *met een scharp Yzer*, 'with a sharp Iron'. The English edition (London 1662) does not contain the expression.

369

English academy (London 1672): 28, has a list of tools for engraving that does not include a scraper; **Evelyn** (London 1661–1662): 307; **Glorez** (Regenspurg 1699), 3, fig. [1] accompanying p. 13. The first flat scraper blades are illustrated in: **Excellency** (London 1688), pl. accompanying p. 80-I. **Bosse** (Paris 1745): 120–121, pl. 12, figs D, E calls this a *racloir*. **Bosse** (Paris 1645): 53, describes the cutting of a burr again, this time only mentioning the use of *le trenchant du burin*, 'the sharp side of (the shield of) the burin'.

370

Filleau des Billettes (1693–1698): 114, pl. [1] no. T (see Fig. 79, p. 93). Here it is a combination tool with the three-sided scraper on the right and a polishing blade on the left; the same combination tool is also laying on the engraver's desk to his right. The first description and illustration of a scraper with a three-sided blade (*grattoir*) shown next to a flat blade scraper is in **Bosse** (Paris 1745): 120–121, pl. 12. For further discussion on scrapers and burnishers see below under 'Mezzotint'.

371

Kosch-Görlitz (Wien 1932): 46.

372

Bosse (Paris 1645): 52–53; **Bylaert** (Leyden 1772): 36, 41; *Chomel 1778*, 5: 2720 (*popje van zwart vilt*); *Dictionnaire portatif 1766*, 1: 575 (*un tampon de feutre noirci*); **Filleau des Billettes** (1693–1698): pl. [1], the roll in the upper left corner of the desk of the engraver (see Fig. 79, p. 93); *Guélard 1743*: 122, pl. LXI, object F (*tampon*) (see Fig. 147); *Halle 1761-1779*, 1 (1761): 208, *Tab*. VII, *Fig*. 5 to p. 222 (*der*

Schwärzfilz); **Kosch-Görlitz** (Wien 1932): 46, mentions that the free left hand is used to rub some black oil paint in the grooves directly after engraving some lines; **Querfurt** (Wien 1792): 127. See 'Drypoint' above for its use.

373

Bosse (Paris 1745): 61; **Cröker** (Jena 1736): 288; **Perrot** (Ilmenau 1831): 44; **Stauffer-Bern** (Dresden 1907): 129–130. Illustration of engraver with mirror in: *Lambert 1987*: 49, fig. 37.

374

For the use of a mirror see above under 'Image and mirror image'.

375

Depauw & Luijten 1999: 389. Any research into the effects of engraving or etching on the eyesight and vice versa, the relationship between eyesight and the quality of the work produced is still lacking. The research that has been carried out on eye disorders among artists has largely been by painters; *Eye Surgeon 1958*.

376

Note that any spectacles are absent in depictions of plate printers.

377

Catalogus 1708: fol. C3r, item no. 518, 'a half round glass, for use by goldsmiths' (*een half rond glas, to gebruyk van de Goudsmids*), although it is not certain if a magnifying glass is meant, the next item no. 519 concerns 'three sun-glasses' (*drie Brand-glasen*); **Compendium** (London 1797): 186; **Francis** (1842) 3 (1842): 384; **Longhi** (Barth; Hildburghausen 1837) 2: 27, 33–34; **Perrot** (Paris 1830): 249; **Perrot** (Thon; Ilmenau 1831): 44–45. Querfurt described a pair of black leather tubes worn like spectacles, but without the lenses: **Querfurt** (Wien 1792): 127–128. Ackermann sold 'Eye Glasses' and 'Stands for ditto'; **Fielding** (London 1841): [1].

378

Janssen (Rotterdam 1966), fig. between pp. 24 and 25.

379

Steel (London 1938): 51.

380

Cooney 1996: 35–37, 42–43; **Lairesse** (Amsterdam 1707) 2: 386; *Von Bartsch 1821*, I: 6–7.

381

Dossie mentions sticking 'pieces of cartoon, or other thick paper, betwixt it and the table, so as to bring it to a proper level'; **Dossie** (London 1758) 2: 200–201. This is a general remark, however, referring to the back of the plate being irregular due to the hammering, as he does not talk about levelling the surface, which is mentioned only shortly afterwards in France, see following note. The idea is the same, though.

382

Lairesse (Amsterdam 1707) 2: 386.

383

First depictions in: *Diderot & D'Alembert 1751–1781, Receuil de planches, quatrième livraison, ou cinquième volume* (1767), *Gravure en taille-douce, en manière noire, manière de crayon, &c*, suite de la pl. 1, figs 12, 13, 18.

384

Cooney 1996: 43; **George** (1857); **Roller** (Wien 1888): 117–118; **Thorstensen** (Oslo 1946): 133–137. Smaller areas may be repaired by melting tin solder into the grooves, and scraping and polishing the surface smooth.

385

Courboin 1914: 26–27.

386

Art of drawing in perspective, (London, 3rd ed., 1769): 69–70, based on **Browne 2** (London 1669): 108, although the author continues on 'etching' the letters instead of engraving them. The engraving of letters, maps and musical scores is described and illustrated in: *Diderot & D'Alembert 1751–1781, Receuil de planches, quatrième livraison, cinquième volume (1767). Gravure en lettres, en géographie et en musique*, pl. 1 (*Gravure en lettres*), pl. 2 (*Gravure en géographie, topograpie, & en musique*). For the nineteenth and twentieth centuries see: *Cooney 1996*: 40; **Dubouchet** (Paris 1891): 70–73; **Perrot** (Paris 1830): 144–160, table (*Tableau des caracteres et des hauteurs, en décimillimètres, des écritures a employer pour la gravure des plans et cartes*), pl. 2; **Schad** (Augsburg 1800): 73–74, not for printing plates. Letter etching in: **Fokke 3** (Leyden 1805): 74–75; **Hodson 1** (London 1800) 2: 417.

387

Campbell 1987.

388

Meyer 2006: 268. The works by Dutch calligrapher Maria Strick were reproduced in engraving by her husband Hans Strick; *Croiset van Uchelen 2009*: 91, 118–119.

389

Casanova (Madrid 1650): [2]. Several Dutch writing masters, such as Cornelis Dircksz Boissens, also engraved their own plates as well as engraved plates for their fellow calligraphers; *Croiset van Uchelen 2009*: 85–86.

390

Trade card for Christian Romanus Dreykorn, Schrift- und Kartenstecher, Nürnberg 1803, engraving, Wolfenbüttel, Herzog August Library HAB, Graph. Res. A: 417. *AKL*, 29: 437, col. 2. *Bowen & Imhof 2001*: 284, mentions the specialist letter engraver Ferdinand Arsenius working in Antwerp in the 1590s. On the other hand, Cornelis Galle I had the texts of his plates engraved by his son Cornelis Galle II when still young (around 20) or by the much older Karel de Mallery, whose eyesight was probably not so good; information kindly supplied by Karen Bowen and Dirk Imhof. Names combined with expressions such as *écrit, scrip.,* or *scripsit* ('has written') are found occasionally referring to the engravers who cut the text, see Appendix 3, p. 413. For a list of letter engravers active in Paris in 1763–1764 see: *Courboin 1914*: 176.

391

Cooney 1996; Diderot & D'Alembert 1751-1781, Receuil de planches, quatrieme livraison, cinquième volume, 1767, *Gravure en lettres, en géographie et en musique*, Article de Musique par Madame Delusse: 3 p., pl. 2, figs A–C; **Dubouchet** (Paris 1891): 74–75; **Enfield** (London, 2nd ed., 1822): 305; *Oberli 1968*: 84; **Perrot** (Paris 1830): 129–138, pl. 2; **Villon** (Paris, 2nd ed., 1914) 1: 343–381.

392

Krummel & Sadie 1990: 40–42; *Singer et al 1954–1984*, 3: 409–410. The earliest engraved musical scores documented are in: *Intabolatura di liuto de diversi, con la bataglia, et altre cose bellissime di m. Francesco da Milano*, Venezia: Francesco Marcolini, 1536.

393

Edlem von Keeß 1823, 2: 37, with the remark that up to three pages could be engraved per day; **Jacque** (574); **Perrot** (Paris 1830): 160–170, pl. 4, with the remark that engraving musical scores is often carried out by women; **Robert** (Henri; Paris 1900); **Villon** (Paris, 2nd ed., 1914) 1: 361–381.

394

For further details and references to the use of tin plates see above under 'Tin and lead'.

395

Music Printing 1990: 48; **Robert** (Henri; Paris, 2nd ed., 1926).

396

See Chapter 1, p. 31.

397

Rupprich 1956–1969, 1 (1956): 296-297. The quote is on p. 297, column 2: *Durerus quanquam … colorum praesidio*.

398

See Chapter 1, p. 35.

399

Vesalius 1543.

400

Compendiosa 1545.

401

The figures and the explanations that accompany the figures are copied literally after Vesalius's work. For a comparison between work by Vesalius and Geminus see: http://www.arsanatomica.lib.ed.ac.uk/superimp.html (2010).

402

Salviani 1554–1558.

403

AKL, 21, 'Cort, Cornelis': 342; *New Hollstein Dutch & Flemish* (Cornelis Cort) 1: xxiv, xxvii.

404

Goltzius was, of course, well aware of what he was doing. In contrast to his modern style of work, he also produced his *Meisterstücke* engraved in the styles of Dürer (*Strauss 1977*: nos. 322, 331) and Lucas van Leyden (*Strauss 1977*: nos. 320, 332–334, 339–343, 353–356).

405

Bosse (Paris 1645): 2.

406

In: *AKL*, 13, 'Bosse, Abraham': 205; *Bosse 1653*: 37.

407

Dorigato 1983: 173–186.

408

Ibid., 174; *Nagler 1835–1852*, 11: 395.

409

Hamerton 1892: 125, pl. between pp. 128 and 129. Hamerton, in comparing this engraving with Marcantonio Raimondi's engraving of *Strength* (B. 375), commented in the caption with the print: 'Besides full modelling, the modern engraver gives the local colour of the hair and beard'.

410

Fielding remarked about the declining state of engraving in 1841; **Fielding** (London 1841): 29. The Sociéte Française de Gravure was founded in 1868 and the Société des Graveurs au Burin somewhat later; *Hamerton 1892*: 127.

411

Rhead (London 1890): VI.

412

The engraving of postage stamps and papers of value continued long into the twentieh century; *Kersten 1989*: 61, 119. Sem Hartz engraved Dutch banknotes and postage stamps from 1936 onwards; *Hartz 1986*. Otto Rohse engraved German postage stamps from 1955 to 1995; http://de.wikipedia.org/wiki/Otto_Rohse (2010).

413

Flocon (Paris 1952); **Kosch-Görlitz** (Wien 1932); **Schultheiss 1** (1941); **Schultheiss 2** (1946); **Steel** (London 1938); *Tschierschky 2008*; *Wenzel 2009*.

414

Hayter (London 1949): 55–64.

415

Billard 1985: 14–29; *Kersten 1989*; *Labyrinth 2002*; *Le Bas 2008*; *Worthen 1996*: 398–399. The technique is especially appreciated for book plates (*ex libris*).

416

Landau & Parshall 1994: 261–264; *Van der Sman 2002*: 59–73.

417

We find dotting for rendering skin and volume in the plates by gold- and silversmiths from the late fifteenth century onwards but these plates were not meant for printing, however; *Von Heusinger 1981*.

418

Von Heusinger 1981: 229–230. In etching dotting is used for the same purpose, see below: 'Chemical Procedures – Tone'.

419

Fielding (London 1841), frontispiece, fig. 8. Tempesti sketched a sabre-shaped burin in his manuscript of 1677–1680; **Tempesti** (Firenze 1994): 152, with reproduction of fol. 96r of his ms.

420

Thieme-Becker, 'Zan, Bernhard', 36: 399; *Zan 1584*.

421

Ackley 1981: 31–32, on Paulus van Vianen; *AKL*, 5, 'Aspruck, Franz': 451–451, Aspruck worked with a multi-pointed punch; *Heusinger 1981*; *Hind 1963-1:* 290, on the Dresden Kellerthaler family, Franz Aspruck and Paul Flindt.

422

Hollstein Dutch & Flemish, 11: nos. 2, 4, 6, 7, 8. Nos. 5 and 10 have dotted work added.

423

Griffiths 1987: 258; *Wiebel 2007*: 121–124.

424

Barabé (1763); *Wiebel 2007*: 124–125.

425

Bernard Picart, *Impostures innocentes, ou recueil d'estampes d'apres divers peintres illustres, telsque Rafael (etc.)*, Amsterdam: La Veuve de Bernard Picart, 1724. Pl. 18 (1st state) is an impression of an etching of three female figures after a drawing by 'Parmessan', 10.3 × 9.6 cm, the whole surface of the plate was filled with drypoint scratches to suggest a grey tone with highlights. In the second state (pl. 11) this is reduced, either because the scratches have worn due to cleaning and wiping off the ink, or the plate was deliberately polished.

426

Trockenstift aus Schiefer, Schmirgel oder Karborund; **Buonaccorsi** (1913): 7. 'Scotch stone'; **Koehler** (New York 1885): 214. *Stiften von feinem Bimsstein und Sandschieffer, Schiefferstifte*; **Tischbein** (Cassel 1790): 19. See the prints by Christian Friedrich Boëtius (1706–1782) that show the use of a variety of tonal techniques. Tones can be strengthened by touching up with acid, see below under 'Direct etching'.

427

See Chapter 4, p. 359.

428

Dyson 1996.

429

Wax (London 1990): 141–148.

430

Laborde 1839: 44–45 (transcription), 69–71 (French translation and facsimile), 117–118 (descriptions of the two states dated 1642 and 1643). The dedication in the address of the portrait also mentions: *ad vivum a se primum depictam novoqu: jam sculpturae modo expressam*, 'first drawn after life by him and now cut with a new way of engraving'. Fifteen years later Prince Ruprecht would correspond with Wilhelm VI, his cousin, about his own activities in mezzotint printmaking, see below under 'Dissemination of information'.

431

Wax (London 1990): 15.

432

Sandrart published in 1675, but may not have been in contact with Von Siegen, who died in 1676; *Hollstein German*, 59: 169; **Sandrart** (Nürnberg 1675–1679).

433

Van Hoogstraeten 1678: 196.

434

Des Billetes (Paris 1693): 145.

435

Evelyn 1697: 283. Because both authors give 1648 as the year of invention, Evelyn may have read or have known about Sandrart's publication.

436

Sandrart (Nürnberg 1675–1679) 1, book 3: 101, col. 2; *Von Heinecken 1771*: 208, 235.

437

Laborde 1839: 18–25; *Seidel 1889*: 34; **Wax** (London 1990): 21, 23.

438

Bowle 1983: 187–188; *Griffiths 1990-1*: 131, nt. 1.

439

Browne (London 1669): 110. The term 'mezzotint' has been retained in the English language, with some corrupted versions such as 'Mascy Tinter', 'Massy-Tincture' and 'Mazzo-Tinto'; *Levis 1915*: 30.

440

Sandrart describes it as *Die also genannte Schwarze Kunst in Kupfer zu arbeiten*, which is like the French term *manière noire*; **Sandrart** (Nürnberg 1675–1679) 1, book 3: 100–101. The Germans still speak of *Schabkunst* after the working process. When talking about the half-shades used in painting Sandrart calls them *mezze tinten oder halbe Schatten*, he does not use the term in connection with printmaking; **Sandrart** (Nürnberg 1675–1679) 1, book 3: 73, col. 1. Baldinucci also refers to the term *Mezzatinta* but only in connection with painting, not printmaking; *Baldinucci 1681*: 98.

441

For a discussion on roulettes see below under 'Roulette engraving'.

442

Manuscript in British Library, formerly Oxford, Christ Church College, Evelyn Ms. 52: fol. 307. The page is reproduced in: *Thomas 2010*: 285; **Wax** (London 1990): 172.

443

For the first publication on mezzotint see: **Evelyn** (London 1662): 145–148. The specimen plate that accompanies it was prepared by Prince Ruprecht. It is a copy of the head of his *Large Executioner*, but the specimen exhibits different textures. The plate for the large print was prepared with a tool that drew semicircular lines; in the small plate, series of dots are visible suggesting that Prince Ruprecht used the rocking tool sketched by Evelyn instead of some kind of drypoint.
444

The tool is depicted a century later in: *Halle 1761–1779, Tab*. VII, accompanying p. 222, *Fig*. 7. See below for further discussion on scrapers and burnishers.
445

Because Prince Ruprecht rocked the complete plate's surface, it was probably his idea, and not Von Siegen's, to do it in a systematic manner, working vertically, horizontally and diagonally. The idea might have also come from one of Prince Ruprecht's early pupils, such as Von Fürstenberg or Vaillant; *Hanebutt-Benz & Fehle 2009*: 105–107, 128–130; **Wax** (London 1990): 18.
446

Browne 2 (London 1669): 110.
447

Excellency (London 1688): 79/I–80/I. This is the second edition – the instructions for mezzotint and the plate with the mezzotint tools were not published in the first edition of 1668. The text on mezzotint and the plate that accompanies it are transcribed and reproduced in: *Levis 1912*: 34–35.
448

Bosse (Paris 1745), pl. 13; *Diderot & D'Alembert 1751–1781, Receuil de planches, quatrième livraison, ou cinquième volume* (1767), *Gravure en taille-douce, en manière noire, manière de crayon, &c*, pl. VII, fig. 000 and second fig. 000; *Edlem von Keeß 1823*, 2: 32; **Fokke 1** (Dordrecht 1796), pl. IX; **Le Blon** (Paris 1756), pl. 3; *Von Bartsch 1821*, I: 20. See also below: 'Rocking'.
449

Wax (London 1990): 180–183. Rocking horizontally, vertically and diagonally only was performed until at least 1960; **Buckland-Wright** (London 1953): 60; **Hayter** (London 1949): 46, and repeated in the other editions; **Lutz** (New York 1933): 225; **Peterdi** (New York 1959): 59, and repeated in all other editions. Instructions for working in more directions, as illustrated by Wax, are found in Hollenberg's typescript of 1936–1941; **Hollenberg** (München 2008): 110. This method appears in print from the mid-1960s; **Brunsdon** (New York 1965): 79; **Heller** (New York, 2nd ed., 1972): 245; **Pietilä** (Jyväskylä 1978): 36; **Ross & Romano** (New York 1972): 100–101.
450

Hanebutt-Benz & Fehle 2009: 55–57; **Wax** (London 1990): 18–19.
451

Hind 1963-1: 11.
452

Hanebutt-Benz & Fehle 2009: 126–127; **Wax** (London 1990): 18–19.
453

Browne 2 (London 1669): 110.
454

The stories about Everdingen and Sherwin and their possible use of rat-tail or half-round files 'pressed down with a piece of lead' are recounted by Hind, citing Chamber's *Cyclopaedia*, 1778–1888, in the edition by Rees, III, 1781, under 'Mezzotinto', without further references. Hind in his turn has reiterated it since; *Hind 1963-1*: 267. For a discussion of Everdingen's tonal prints see *Mansfield 1995*.
455

The use of extra weights fitted to a rocker is modern. It was not recorded until recently and might have been inspired by the older story; **Wax** (London 1990): 179–180.
456

Luttrell 1 (London 1783).
457

Excellency (London 1688): 79, pl. opp. p. 80, 'The Engine'.
458

Glorez (Regenspurg 1699) 3, *Fig*. 1 opp. p. 13, *fig*. A. Glorez shows loose blades with radial grooves on the facets to be kept in a vice.
459

See Chapter 4, p. 363.
460

Bosse (Paris 1745), pl. 12; **Cröker** (Jena 1736): 292–296; *Diderot & D'Alembert 1751–1781, Receuil de planches, quatrième livraison, ou cinquième volume* (1767), *Gravure en taille-douce, en manière noire, manière de crayon, &c*, pl. VII, figs 1–3; **Filleau des Billettes** (Paris 1693–1698), sketch on p. 145; **Fokke 1** (Dordrecht 1796), pl. IX; **Halle** (1761), *Tab*. VII, *Fig*. 6 to pp. 222 and 228; **Le Blon** (Paris 1756), pl. 2, figs A, B; **Perrot** (Paris 1830): 2, fig. 4.
461

The tool is called *berceau* in French; **Bosse** (Paris 1745): 118; **Le Blon** (Paris 1756), pl. 2, figs A, B. 'Cradle' in English; **Compendium** (London 1797): 190; **Dossie** (London 1758) 2: 173–175, the modern English term is 'rocker'. *Wiege* or *Bogen* in German; **Bosse** (Dresden 1765): 184, the modern German term is *Wiegeeisen*. *Wiggel* or *beitel* in Dutch; **Fokke** (Dordrecht 1796): 312, the modern Dutch term is *Wiegijzer*.
462

Fielding (London 1841): pl. [1], no. 10. A rocker with parallel grooves engraved on the facet of the blade is still depicted some ten years earlier; **Perrot** (Paris 1830): pl. 2, F4.
463

Wax (London 1990): 172.
464

Ibid., 184–187.
465

Bosse (Paris 1645): 52–53. For more details about scrapers see above under 'Engraving' and 'Other tools'.
466

Browne 2 (London 1669): 110; *Van Hoogstraeten 1678*: 196.
467

Excellency (London 1688), pl. opp. p. 80, *The Several Scrapers*. Luttrell describes and sketches that the scrapers should be 'made like ye points of rapiers of fine razor mettle well tempered and hardned … You may be furnished with your scrapers att any rasor makers if you cutt out papers of these shapes following for his direction [two crude diagrams follow]. You must have some bigger and some less'; **Luttrell 1** (London 1783).
468

Cröker (Jena 1736): 294–295. **Glorez** (Regenspurg 1699): 3.
469

Filleau des Billettes (Paris 1693–1698): 114, pl. [1] no. T. Two scraper-burnisher combination tools are depicted on a drawing inserted in a Spanish manuscript, which must be dated in the eighteenth century; **Método** (1993).
470

Bosse (Paris 1745): pl. 12, no. F.
471

Cröker (Jena 1736): 294–295: *Schabe-Eisen*; *Hind 1963-1:* 11, fig. 1 no. 23; **Le Blon** (Paris 1756), pl. 2. Chomel states that for scraping, the point of a sword or a similarly shaped piece of steel two inches long is used, thus a *racloir*; *Chomel 1778*, 5: 2721. Spilsbury indicates that instead of a three-sided blade 'an old razor, the edge ground square, is no bad apology'; **Spilsbury** (London 1794): 11.
472

Diderot & D'Alembert 1751–1781, *Planches*, *quatrième livraison, ou cinquième volume* (1767), *Gravure en taille-douce, en manière noire, manière de crayon, &c*, pl. I, fig. 4 (*ébarboir*), fig. 5 (*grattoir*), fig. 6 (*brunissoir & grattoir*); pl. VII, figs 4,5 (*racloir*). Roubo similarly calls the scraper with a three-sided blade a *grattoir* and the one with a four-sided blade an *ébarboir*; *Roubo 1977*, 3: 1279, 1285, pl. 337, fig. 3. Dubouchet illustrates the tool with a short description, but states it is no longer in use; **Dubouchet** (Paris 1891): 14 fig. 7.
473

See above under 'Planing and polishing'. Bosse does not mention a polishing tool in 1645, although he should have been acquainted with it because a burnisher can be seen in one of his books on perspective; *Bosse 1653*, pl. 31. An illustration in *La perspective practique* shows among the craftsmen depicted an engraver at work. On the desk in front of him is what looks like a combination tool, but whether it has a scraping and a polishing end or whether both ends are for polishing cannot be discerned because of the small size of the image; *Perspective practique 1642–1647*, 1 (1642), the same fig. on pp. [9] and [11]. Combination tools with two ends for polishing are more common, see: Wenceslaus Hollar, *Selfportrait after a Painting by Joannes Meyssen, 1646–1649*, etching, the tool on the left of the group of four etching needles. A 'Burnisher' is illustrated among the mezzotint tools in *The Excellency of the Pen and Pencil* (1688); **Excellency** (London 1688), pl. opp. p. 80.
474

Halle 1761–1779, *Tab*. VII, accompanying p. 222, *Fig*. 7.
475

Bosse (Paris 1745), pl. 12, fig. F; **Bosse** (Paris 1758), pl. 12, fig. F; **Filleau des Billettes** (Paris 1693–1698), the plate with the engravers, fig. T; *Diderot & D'Alembert 1751–1781*, *Receuil de planches*, *quatrième livraison, ou cinquième volume* (1767), *Gravure en taille-douce, en manière noire, manière de crayon, &c*, pl. I, fig. 6 (*brunissoir & grattoir*); **Le Blon** (Paris 1756): 2, fig. H; **Método** (s.l. 1700); *Roubo 1977*, 3: 1018, 1271, pl. 337, fig. 4; **Schellenberg** (Winterthur 1795), Tab. 1, the tool between fig. 1 and fig. 2.
476

Le Blon (Paris 1756), pl. 2, figs C, D.
477

Gross (London 1970): 146, fig. 64; **Herkomer** (London 1892), pls. between pp. 80 and 81, 82–83; **Paton** (1892–1894) 3 (1893–1894): 14; **Paton** (London, 2nd ed., 1909): 84; **Wax** (London 1990): 180..
478

Banister (New York 1969): 88; **Brunsdon** (London 1965): 79–80, costs are 'fourpence per square inch'; **Chamberlain** (London 1972): 141, has a detailed description taken from the catalogue of Kimbers Etching Supplies Ltd, London; **Hubbard 2** (London 1931), fig. XI; **Wax** (London 1990): 180.
479

Filleau des Billettes (Paris 1693–1698): 146; *Griffiths 1990-1*: 136.
480

Keller (Stuttgart 1815): 22–30, fig. 3.
481

Carborundum print (Washington 1940); *Medley-Buckner 1999*: 34; **Winkler** (New York 1995): 18. Further contemporaneous articles: **Carborundum mezzotint** (1947); **Hood** (1938); **New carborundum print developments** (1940); **New print process** (1938). The techniques should not be confused with collagraph techniques that involve gluing carborundum powder to the printing plate; *Medley-Buckner 1999*: 35. For details see below under 'Modern developments'.
482

Lairesse (Amsterdam 1707) 2: 400.
483

See Chapter 4, p. 333.
484

Lupton (1823).
485

Turner (1824).
486

Von Bartsch 1821, I: 20. Repeated in: *Edlem von Keeß 1823*, 2: 32.

487

Full-length lifesize portraits were produced in the eighteenth century by pasting together impressions from several plates. The thesis for Wenceslaus Dobrcensky, University of Prague, 1728, with the portrait of Karl VI by Johann Elias Ridinger measures 236 × 152 cm and comprises ten impressions; *Dräxler & Ertl 1994*. Another mezzotint portrait of Karl VI of around 1740 measures 252 × 158 cm and comprises five plates; *Živný 1990*. Chuck Close made one large mezzotint (*Keith*, 1972, 112 × 89 cm, printed on one sheet) by scraping a photomechanically made aquatint structure; **Wax** (London 1990), p. 259. Of the modern mezzotint artists the single, ie not compiled, plates by Japanese mezzotinter Masataka Kuroyanagi rank among the largest with widths up to 90 cm; *Kuroyanagi 2000*.

488

Delâtre (Paris 1887): 23.

489

Dossie (London 1758) 2: 174; **Querfurt** (Wien 1792): 130–133; *Von Stetten 1779–1788*, 1: 423, recalls that Gottlieb Heiss, active as a mezzotinter in Augsburg, invented a kind of rocking apparatus early in his career, which may have been early in the eighteenth century.

490

Durand (1833), Saulnier's address in Paris is given.

491

Shin Nihon Zokei 2010: 47; **Wax** (London 1990): 186, 189.

492

Mollet 1981.

493

See below under 'Dust-grain aquatint'.

494

Stijnman 1991-2.

495

Hollstein German, 36: 155, says that Von Siegen met Prince Ruprecht in Brussels in 1654. Wax opts for Vienna 1654 or Kassel 1655, because the prince's oldest known mezzotint is dated '1657'; **Wax** (London 1990): 17. The latest research confirms that Von Siegen was in the service of the *Kurfürst* and Archbishop of Mainz Johann Philipp von Schönborn in January 1654 and had probably arrived in Mainz some months before; *Hanebutt-Benz & Fehle 2009*: 98. For Von Siegen's contacts in Mainz see: *Hanebutt-Benz & Fehle 2009*: 101, 103, ff. These persons are: Prince Ruprecht von der Pfalz, Dietrich Caspar von Fürstenberg, Johann Friedrich von Eltz, Johann Jacob Kremer, Caspar Dooms, Jodocus Bickart, Jan Thomas and Wallerant Vaillant. Von Siegen did not communicate his knowledge before, however; *Hanebutt-Benz & Fehle 2009*: 171.

496

Ibid., 107, 111.

497

Ibid., 113–114, this concerns Johann Friedrich von Eltz (1632–1686) and Johann Jacob Kremer (fl.1670).

498

Ibid., 103, 105. Prince Ruprecht mentioned the mezzotint technique and several undefined tools in his correspondence with Wilhelm VI *Landgraf* of Hessen-Kassel in 1657–1658; *Morrah 1976*: 393–394.

499

Rogeaux 1999: 81. Vaillant portrayed the prince in black and white crayons in Frankfurt am Main in 1658 and based a mezzotint portrait on this drawing; *Hanebutt-Benz & Fehle 2009*: 128–129; *Rogeaux 1999*: 82–83, pl. G. 13. The plate was completely rocked, the tones and highlights scraped away and polished; linear details are engraved with a burin.

500

Hanebutt-Benz & Fehle 2009: 130; **Wax** (London 1990): 17.

501

Hanebutt-Benz & Fehle 2009: 131; *Rogeaux 1999*: 46–54, 115–117; *Thomas 2010*: 289; **Wax** (London 1990): 18–20. Vaillant apparently did not teach the mezzotint technique in France, where it was only introduced by the Flemish engraver Jan van der Brugge in 1680–1682; *Rogeaux 1999*: 117–120.

502

Hanebutt-Benz & Fehle 2009: 131. The earliest English reference to mezzotint is in a manuscript by John Evelyn and dated 16 January 1661; *Thomas 2010*: 279–280. References to meetings with Prince Ruprecht in Evelyn's diaries for 21 February and 13 March 1661; *Bowle 1983*: 187–188; *Dobson 1996*, 2 (for the years 1647–1676): 159–160. 'Letter of Robert Murray to John Evelyn', Whitehall, 6 May 1661, in: *Griffiths 1995*. Evelyn did not mention this event in his diaries, but he noted that he met Murray on 3 and 9 May for other business; *Dobson 1996*, 2 (for the years 1647–1676): 167–168; *Thomas 2010*: 283. Evelyn referred to a meeting with Prince Ruprecht again on 7 May 1662, this time in connection with experiments with Robert Boyle's vacuum pump; *Dobson 1996*, 2 (for the years 1647–1676): 185.

503

Hanebutt-Benz & Fehle 2009: 172; *Thomas 2010*: 282, 288. For Evelyn's arguments see Chapter 2, p. 87.

504

Books containing mezzotint illustrations are rare. Because the plates wear so quickly no large editions can be pulled and consequently a book illustrated with mezzotint cannot be published in higher print numbers than a few hundred.

505

Evelyn (London 1662), mezzotint plate. For the second edition of 1755, also found in its two reissues of 1765 and 1769, a new mezzotint plate of the *Executioner's Head* was made by Richard Houston and this time the plate was probably prepared with a rocker; **Evelyn** (London 1755).

506

Griffiths 1990-1: 136. Pepys's diary for 5 November 1665; *Latham & Matthews 1970–1983*, 6 (1972): 289. Evelyn's diary does not have an entry for this day; *Dobson 1996*, 2 (for the years 1647–1676): 234–235, n. 4: 237; *Levis 1915*: 60.

507
Browne 2 (London 1669): 110.
508
Griffiths 1990-1: 136–139; *Thomas 2010*: 289–291.
509
Hanebutt-Benz & Fehle 2009: 133, 151; *Thomas 2010*: 292.
510
Diderot & D'Alembert 1751–1781, Receuil de planches, quatriéme livraison, ou cinquième volume (1767), *Gravure en taille-douce, en maniere noire, maniere de crayon, &c*, pl. VIII, figs 11, 15, not only reproduced crayon lines, but even the texture of the laid lines of the paper; note that the reproduced laid lines are at right angles to the actual laid lines of the paper on which this plate is printed.
511
See also below under 'Chemical Procedures – Crayon'.
512
Compare this with the multiple-pointed punch used by Franz Aspruck.
513
François made earlier attempts to reproduce crayon-like lines in 1740 for which he reproduced the drawn line by engraving two to four parallel lines and making counterproofs of the impressions; *Herold 1931*: 14–16. *Griffiths 1987*: 255–256.
514
Roulettes were already being used in bookbinding for tooling leather covers in the sixteenth century; *Andriessen 1552*: fol. D7v, D8v, (= pp. [62], [64]).
515
Hodson 2 (London 1805): 124.
516
Griffiths 1987: 256.
517
See above under 'Mechanical Procedures – Tone'.
518
Bonnet (Paris 1769); *Carlson & Ittmann 1984*: 194–195; *Grasselli 2003*: 68–71; *Herold 1935*: 123 no. 192; *Lambert 1987*: 100 fig. 80a, and 129 pl. IX. See also Chapter 4, p. 362.
519
Gramaccini & Meier 2003: 41. See also Chapter 4, p. 363.
520
Encyclopédie méthodique 1782–1832, Beaux arts, 1 (1791): 625–626; **Meynier** (Hof 1804): 133, *Französische Manier*; **Netto 2** (Quedlinburg 1840): 31–34, with further information on the use of roulettes on an etching ground; *Von Bartsch 1821*, 1: 31–32.
521
Schwegman (Haarlem 1806): 5–6. Prints with roulette textures by Schwegman; *Sliggers 1993*. Prints by Boetius with roulette structures in the Wolfenbüttel, Herzog August Library, Graph. A1: 227 and 228. Roulettes were occasionally used by others – see for example prints by the Dutch etcher Jacob Holaert (1713–1789).
522
Meynier (Hof 1804): 113–142: 217–224, Tab. IV–VII.
523
Ibid., 134–135; **Netto 2** (Quedlinburg 1840): 32; **Schwegman** (Haarlem 1806): 6.
524
Schwegman (Haarlem 1806): 6.
525
Bylaert (Leyden 1772): 30–38 (Dutch text): 35–43 (French text), pl. A, B.
526
See below under 'Transfer process'. The facsimiles published by Ploos van Amstel were of international renown; *Laurentius et al. 1980*: 125; *Meusel 1783*; *1788*: 55–57.
527
Gramaccini & Meier 2003: 42.
528
Hodson 2 (London 1805): 124. Similar reactions as related to technique and style are expressed regarding photography in the second half of the nineteenth century and digital prints in the late twentieth century, see below under 'Non-manual Procedures'.
529
See below under 'Photogravure'.
530
Compare the following paragraph with 'Chemical Procedures – Modern developments' below.
531
Pring (1843). See also: *Harris 1968–1970*: 6: 89, the process was known as 'via sicca' or 'voltaic etching'; *Nadeau 1989–1990*: 110a (Electrozincography), with further literature; **Perrot** (Paris 1865): 299.
532
Gross (London 1970): 157, 159; **Janssen** (Rotterdam 1966): 78–79, pl.
533
Banister (New York 1969): 86–87, ill. 144; *Billard 1985*: 17; **Daniels** (London 1971): 191; **Gross** (London 1970): 157; **Maxwell** (Englewood Cliffs 1977): 61–62; **Reddy** (Albany 1988): 61–62, col. pl. 4–5; **Silsby** (New York 1943): 100–103. Dentists' drills are used and various companies supply small power drills, often mentioned are Dremel tools.

534
Pardo Rabadán (2007); http://en.wikipedia.org/wiki/Engraving (2010), see the section 'Modern process'.

535
U.S. Patent No. 2.604.042 (applied 1948, patented 1952).

536
Swedish Patent No. 360.820 (applied 1967, patented 1973). Molin used it for a series of portraits of all the Nobel prize winners up to 1967; *Molin 1979*.

537
Desmet 2010; **Whale & Barfield** (London 2001): 22, 78; *Wei 2002*: 9. Search the Internet for 'Gravolaser'.

538
Manuals in the 1950s do describe mezzotint, but also mention that it is not much used; **Buckland-Wright** (London 1953): 58–61; **Hayter** (London 1949): 46–51; **Peterdi 2** (New York 1959): 57. For an overview of developments since the nineteenth century see the chapter 'The Rise of the Original Mezzotint' in: **Wax** (London 1990): 140–148.

539
Trevelyan (London 1963): 10. Nevertheless, even in 1976 Patrick Morrah expressed his gratitude to Lawrence Josset, 'believed to be the only contemporary British artist working in mezzotint, (who) explained the process to me'; *Morrah 1976*: 452 nt. 15.

540
Wax (London 1990): 146.

541
Hubbard 1 (London 1920): 83, there is a specimen print accompanying the article. In his article on aquatint he refers to Legros who ran an etching plate through the press with a sheet of sandpaper on top to perforate the etching ground in order to make an aquatint texture; **Paton**, 3 (1893–1894): 13–15.

542
Plowman 2 (London 1924), pl. opp. p. 72.

543
Kubas (Bratislava 1959): 108–198, fig. 37. The contraption looks impressive though not efficient and was probably little or never used.

544
Ginkel (Nijmegen 1981): 61; **Trevelyan** (London 1963): 77; **Wax** (London 1990): 246–249.

545
Others after him called it 'Galvanogravure', 'Galvanotype', 'Herkomertype' or 'Herkotype'. Hollenberg says the technique was already invented by Franz von Kobell in Germany in 1840, but Kobell's technique relates more to electrotype because a new (intaglio) plate is produced; **Hollenberg** (Ravensburg 1962): 75–76. The same is relevant for a similar process patented by Edward Palmer in 1841. For both see below under 'Replication of intaglio printing plates'.

546
Herkomer (London 1892): 106; *Neunzert 1999*: 125; **Professor Herkomer's New Art** (1896); **Thorstensen** (Oslo 1946): 103–104; **Ziegler** (Halle, 2nd ed., 1912): 225–227.

547
Paton was aware of Herkomer's process but adapted it slightly upon learning that Herkomer had withdrawn permission to use his method; **Paton** (London 1895): 104–105, with specimen.

548
Carey & Griffiths 1984: 225, 231–232; *Castleman 1976*: 154, fig. 134; **Hartill** & **Clarke** (London 2005): 6–10, sketches a brief history of collagraphy; *Hentzen 1964*.

549
Alps 1979.

550
'Collagraphy' should not be confused with 'collotype', the American name for *Lichtdruck*, a photomechanical planographic process.

551
Hartill (London 2005): 10.

552
Brunsdon (London 1965): 81; **Janssen** (Rotterdam 1966): 78–79, [3] ill.

553
Ross & Romano (New York 1972): 126.

554
Elexpuru (Bilbao 1995).

555
Bottomley (1997); **Coode 2** (1999); **Jones** (2002); **Ross & Romano** (New York 1972): 128; **Wenniger** (New York 1975): 22 ff.

556
A variation involves covering the plate by brushing it with an acrylic gel, covering this with aluminium foil and drawing with a stick onto the foil, thereby indenting the gel underneath; **Wells** (2002).

557
Dohmen (Köln 1986): 186–188, in combination with etching; **Goetz** (Paris 1969); *Goetz 1973*; **Rousseau-Leurent** (Villefranche-sur-mer 1991); **Winkler** (New York 1995). For mezzotint plates made by grinding with carborundum powder, see below under 'Mechanical Procedures – Tone'.

558
Clarke (2005); **Stobart** (New York, 2nd ed., 2005): 80–81, gives instructions, although the mixture of acrylic and carborundum powder had already been mentioned in a caption to an illustration in the first edition; **Stobart** (London 2001): 71. **Wray 1** (2005).

559

Same as photography in printmaking, see also below under 'Photomechanical techniques'.
560

Elexpuru (Bilbao 1995); **Ramos Guadix** (Sevilla 1986); **Ross & Romano** (New York 1972) with a separate edition on collagraphy only: **Ross & Romano** (New York 1980); **Stobart** (New York 2001); **Stoltenberg** (Worcester, Mass. 1975); **Waimon** (2003); **Wenniger** (New York 1975).
561

The following paragraphs are extended versions of *Stijnman 1995* and *1999*.
562

Hayter (London 1949): 69; *Janssen et al. 2010*: 143, 159; **Schoonebeek** (Amsterdam 1698): 11; **Talbot** (1858): 193.
563

Schober (Göttingen, 3rd ed., 1986): 27.
564

See Chapter 1, p. 49.
565

Drying oils, such as linseed and walnut oil, contain high percentages of unsaturated fatty acids. These oxidise and polymerise at the same time, which is called 'oxidative polymerisation'. Non-drying oils, such as olive oil, contain a very low percentage of unsaturated fatty acids and consequently do not dry. The percentage of unsaturated fatty acids is expressed by the 'iodine value' of the oil, ie the amount of iodine the oil can absorb; *Apps 1958*: 7, 14–16.
566

Ibid., 33. Red lead or minium is Pb_2O_3, lead white is basic $PbCO_3$, yellow lead is either litharge or massicot, but the chemical formula of both is PbO.
567

Leonard da Vinci (1504) explains how he 'thinks' a copper or iron (his recipe is inconsistent) relief printing plate can be produced. His ground is the same as many others both before and after him for decorating iron objects, namely an oil varnish mixed with yellow lead or red lead; *Reti 1971*: 193; *1973*: 28; *1974*: 272.
568

Braekman 1990: 122: *schildersvernis* (1549).
569

Bosse (Paris 1645): 9. Callot gave Bosse an amount of oil varnish that he used for a long time.
570

A very similar recipe for coating copper with a dark brown layer is given by Theophilus in the twelfth century; *Theophilus*, book 3, chapter 70 (Theobald) or 71 (other); *Theophilus 1961*: 129; *1979*: 147–148; *1984*: 129–130: 360 n. 1; *1999*: 198. For mediaeval examples of this technique from northern Germany see: *Müller 2010*: 300, Abb. 110 (early thirteenth century); *Theophilus 1999*: 179, fig. 71.2 (third quarter twelfth century).
571

Vasari 1568: 304.
572

Cellini (Fiorenza 1568): fol. 43v. Cellini says the addition of wax prevents the ground from cracking when it is drawn upon. The wax works as a plasticiser, making it easier to draw through the hard oil ground.
573

Bate (London 1634): 141.
574

Melting resin into boiling oil to make a varnish is described by Theophilus as early as the beginning of the twelfth century, his recipe going back to at least the eighth century; see Chapter 1, p. 35.
575

Turquet de Mayerne 2 (London 1620–1646): fol. 33v–34r; **Turquet de Mayerne 2** (Walluf 1973): 160–163.
576

Bosse (Paris 1645): 9.
577

Bosse (Paris 1745): v. For a series of comparative reconstructions of etching ground recipes in this edition see: *Yasui & Kamitani 2011*: 21–39.
578

Lawrence (1843); **Deleschamps** (Paris 1836): 57, *Vernis de Florence*; **Perrot** (Paris 1830): 34, *Vernis de Florence*; **Villon** (Paris 1894) 1: 79.
579

Brun 1902–1917, 2: 384; **Fokke** (Dordrecht 1796): 239–240, 242; *Füßli 1769–1779*, 1: 74; *Hind 1963-1*: 8 n. 4 and 105 n. 2; *Nagler 1835–1852*, 9: 137, 213; **Sandrart** (Nürnberg 1675–1679) 1, I. Theil, II. Buch, VI. Capitel: 50, col. 1. According to Bosse, Merian used a soft etching ground; **Bosse** (Paris 1645): 2.
580

Etching ground (southern Netherlands 1601–1625); **Brugghen** (Amsterdam 1616); **Paduan ms** (1590–1625), in *Merrifield 1967*: 666–667. If similar recipes are found after 1700, then the recipe was copied after an earlier example, but unlikely to have been in use until they turn up again by the end of the nineteenth century; **Robertson** (London s.a.): 12; *Sales Meyer 1890*: 407.
581

Francis and Turrell described the properties of the ingredients and the best way of preparing the ground; **Francis** (1843) 4: 127–128; **Turrell 3** (1825).
582

Van Dyck (Antwerpen 1630): fol. 6r. The full text reads: *Om te etsen ghij sult nemen een ons witen was ende onder half ons aspaltum ende een quaertien reusen herdst ende een half ons terrementijn* (etc.). 'To make an etching: you should take an ounce of white wax and one and a half ounces of asphaltum and a quarter of resin, and half an ounce of turpentine'; *Jaffé 1966*, 2: fol. 6r, 209–210 (transcription, revised

here), 214–215 (English translation). There is discussion about the date of the text and whether or not this recipe was written by Van Dyck himself.

583
Bosse (Paris 1645): 41. A little more wax is added in winter to keep it soft. Note that Bosse's *verny mol* or 'soft (etching) ground' is not the same as the later *vernis mou* or 'soft-ground', which is the normal soft etching ground with an extra ingredient added that makes it soft and sticky; see below under 'Crayon – Soft-ground etching'. Note also that Macquer used the term *vernis mou* for what Bosse calls *verny mol*; *Dictionnaire portatif 1766*, 1: 573.

584
This recipe for a soft etching ground is found in all translations after Bosse, and furthermore in: **Deleschamps** (Paris 1836): 57; **Lumsden** (London 1925): 36; **Rueda** (Madrid 1761): 77; **Schellenberg** (Winterthur 1795): 16, although he uses *Judenpech* (colophony resin) instead of asphaltum; **Schoonebeek** (Amsterdam 1698): 12. These authors would have copied the recipe directly or indirectly after that in Bosse's treatise.

585
Janssen et al. 2010: 144–145, 160, figs 3–5.

586
Roller (Wien 1888): 30.

587
Deleschamps (Paris 1836): 66 for latex (*caoutchou*, sic!) in a liquid stopping-out varnish, p. 68 the same in ball ground. **Hamerton** (1870): 188, Japan varnish for a liquid ground. **Perrot** (Paris 1865): 39, copal resin (from Africa) and gum anima (from South America), for ball ground.

588
Bosse (Paris 1645): 15–18, pl. 2.

589
Beeswax melts at around 70°C, colophonium just above 100°C, asphaltum has no fixed melting point being a mixture of several substances. Some recipes explain how to heat the plate until a drop of saliva rolls off, which would mean a temperature of around 120°C or higher; **Bruggen** (Amsterdam 1616): fol. D3v; **Francis** (1842) 3: 205.

590
Rauch (1843); Rauch spells 'Le Kreux', meaning 'Le Keux', which could be either Henry or John Le Keux. Compare with the printer Ramshaw who invented hotplates for inking and wiping that were heated with steam; **Ramshaw** (1819); **Solly** (1819): 54.

591
Lumsden (London 1925): 64, refers to an electric heater in 1908. The stove is usually the same as that for inking and wiping, see Chapter 2, p. 98.

592
Bosse (Paris 1645): 42; **Browne 1** (London 1660): 28; **English academy** (London 1672): 26; **Excellency** (London 1668): 50.

593
Janssen et al. 2010: 146–147, 161, fig. 6–8; **Schoonebeek** (Amsterdam 1698): 15–16.

594
Bishop (Philadelphia 1879): 18; **Hamerton** (1866): 296.

595
Lalanne (Paris 1866): 14, 19, 55; the roller is used for revarnishing the plate, although it is also possible to use the dabber.

596
Lalanne (Boston 1888): 13, 38–39, 65.

597
Warren (1823): 93.

598
Here the earliest sources are given; liquid grounds appear in manuals regularly thereafter. **Chattock** (1880): 16–17, chloroform; **Hamerton** (1866): 299; **Hamerton** (1870): 188, natural turpentine; **Hamerton** (London 1871): 22, ether; **Paton** (1892–1893): 50 (1893–194): 146, chloroform or ether; **Preissig** (Leipzig 1909): 34, natural turpentine, ether, alcohol, benzine, chloroform; **Robinson** (London s.a.): 11, 12, 23, chloroform or ether; **Roller** (Wien 1888): 32, natural turpentine; *Sales Meyer 1890*: 407, benzine; **Short** (London 1888): 11–12. For volatile organic solvents see Chapter 4, pp. 325 and 326.

599
Hubbard 1 (London 1920): 39–40, advertisement for liquid grounds on p. [5] at the back; **Lumsden** (London 1925): 41–42, advertisement for Rhind's liquid ground on p. [9] at the back; **Robins** (London 1922): 25–26, advertisement for Rhind's liquid ground on p. [5] at the back.

600
Preissig (Leizig 1909): 34–38. The use of the centrifugal machine came from the photographer's workshop where it was utilised to evenly spread collodium over a glass plate in order to make photosensitive plates. The plates that can be prepared in this way would probably not exceed a format of 25 × 25 cm.

601
Roller (Wien 1888): 106.

602
The solid ground does not harm the printmaker provided he does not eat it or smear it on his skin. No toxic fumes are produced in applying a solid ground onto a hotplate, unless the ground is charred.

603
For further discussion see below under 'Modern Developments – Etching grounds'.

604
The earliest known recipe for what could be used as a stopping-out varnish, although it is presented as a painting varnish, is in the Antwerp sketchbook of Van Dyck (c.1630) and concerns a resin dissolved in turpentine kept in a small glass bottle; **Van Dyck** (Antwerpen 1630): fol.

3, 8. A very similar prescription, seen as a stopping-out recipe now, is found at the back of a Rembrandt drawing; **Van Rijn** (Amsterdam 1655). A recipe for a transparent varnish (*witten vernis*), ie a solution of gum sandarac, mastic, benzoin resin and Venice turpentine in alcohol, is found in a copy of the Dutch translation of Bosse; **Bosse** (Amsterdam 1662), see Appendix 4, No. 042.28. For other stopping-out recipes see: **Academia Italica** (London 1666): 20, grease in oil; **Alken** (London 1849), resin dissolved in turpentine; **Book of drawing** (London 1679): 22, tallow and etching ground, melted together and applied warm; Abraham Bosse, *Graveurs en taille douce au Burin et a Leaue forte*, 1643, fat (see Fig. 68, p. 80); **Bosse** (Paris 1645): 10, tallow in olive oil; **Bosse** (Amsterdam 1662): 2–3, olive oil with tallow melted together, and p. 122 gives etching ground in walnut oil, a mixture of pitch, oil varnish and balm of turpentine; **Browne** (London 1660): 31, melted tallow; **De Mayerne** (London 1632): 166, fat in turpentine; *Diderot & D'Alembert 1751–1781*, *Receuil de planches*, *quatrième livraison, ou cinquième volume*, *Gravure en cachet*, pl. II, fig. 11, recommends *vernis de peintre ou vernis de Venise*; **English Academy** (London 1672): 27, etching ground and tallow; **Excellency** (London 1668): 53, etching ground and tallow; **Fielding** (London 1841): 9–10, resin dissolved in turpentine; **Garcia Hidalgo** (Madrid 1693), tallow in oil; **Green** (J.H.; London 1804): 10, turpentine varnish with lampblack, asphaltum with spirit of turpentine, turpentine varnish with spirits of turpentine and lampblack; **Lairesse** (Amsterdam 1707): 396, balm (?) of turpentine with colorant; **Orlandi** (Napoli 1733): [58], tallow in turpentine; **Ter Borgh** (Zwolle 1635), melted tallow; **Tiquet** (Antwerpen 1741): 88, pitch and tallow; **Tischbein** (Kassel 1790): 8, turpentine varnish with lampblack; **Witgeest** (Amsterdam 1679): 170, tallow in olive oil.

605
Herkomer (London 1892): 44, shellac in high-grade alcohol; **Schellenberg** (Winterthur 1795): 38, pitch in alcohol, and painting varnish (*Braunschweiler Firnieß*) with 'printing black', which sounds like the 'Brunswick black' commonly used by English etchers.

606
Lairesse uses a polishing tool; **Lairesse** (Amsterdam 1707): 380–381. Schoonebeek has a special instrument for this, a kind of pin in a handle; *Janssen et al. 2010*: 151–152, 162, figs 13, 14; **Schoonebeek** (Amsterdam 1698): 21, drawing. **Liebhaber 2** (Nürnberg 1703): 338.

607
See below under 'Aquatint'.

608
See above under 'Tracing'.

609
See Chapter 1, p. 52.

610
There is also a type of burin called *échoppe* in French, 'scorper' in English, that has a shaft with a round section; see above under 'Engraving'.

611
Bosse (Paris 1645): 25–28, pl. 5, and he mentions the *échoppe* several times in earlier pages. John Evelyn was apparently better acquainted with Bosse's work than with Callot's, because he speaks of '*Monsieur Bosse's* invention of the *Eschoppe*'; **Evelyn** (London 1662): 126. The brothers Doetechum drew and etched their plates in such a neat and controlled way that it was considered and appreciated by Matthis Quad von Kinkelbach as imitating engraving in etching; *Quad von Kinkelbach 1609*: 431; *Riggs 1977*: 140.

612
Bosse (Paris 1645): 3.

613
Although the description of using the *échoppe* is always translated faithfully there is no translation of Bosse's manual with plates that are drawn with this tool. The French editions continued to be printed using his original plates and the use of the *échoppe* is visible in the illustrations in the third and fourth editions, with the wider lines turning lighter showing that the structures of the bottoms of the etched grooves are wearing away.

614
Bosse (Paris 1645): 19, pl. 3; **Bosse** (Paris 1745): 78–79, 82–83, 85; **Ter Borch** (Zwolle 1632–1635), makes several references to needles with different points throughout the manuscript. Schoonebeek explains and illustrates the making and use of needles of six different widths and apparently is not familiar with Bosse's *échoppe*; *Janssen et al. 2010*: 149–150, 161–162, figs 10, 11; **Schoonebeek** (Amsterdam 1698): 19, drawing. For other techniques to create thinner or wider lines see the explanation above on multiple biting.

615
Bosse (Paris 1645): 25.

616
Frieß 1993: 144–154.

617
Bosse (Paris 1745): 60; *Frieß 1993*: 117–121; **Rueda** (Madrid 1761): 61–67, pl. 5.

618
Perhaps the pantograph was used by Jean-Baptiste de Grateloup (1735–1817) for his miniature etchings on steel; *Thieme-Becker*, 'Grateloup, Jean-Baptiste de' 14: 543.

619
Farey (1813); **Harrison** (Arthur; 1821); **Longhi** (1793); **Nicholson** (1799); **Turrell 1** (1817).

620
See below under 'Mechanical intaglio processes'.

621
Vasari uses both the terms *acqua forte* and *acqua da partire* in one reference. The second term refers to nitric acid – the first one is more general and could mean either a salts-in-vinegar solution or nitric acid; *Vasari 1568*, 2: 304. Leonardo da Vinci describes etching a copper or iron (he mentions both metals) relief printing plate, possibly with nitric acid; *Reti 1971*: 193; *1973*: 28; *1974*: 272. For a discussion on the introduction and early use of nitric acid see: Chapter 1, p. 48.

622
Cellini's etching recipe containing salts in lemon juice or alternatively salts in vinegar, in the manuscript starts with: *L'acqua forte da*

intagliare si fa in questo mode. The recipe for nitric acid in the manuscript starts with: *L'acqua da partire si fa in questo mode*. Thus he makes a clear distinction between a mordant for printing plates (*da intagliare*) and parting water (*da partire*). For the various published editions of the manuscript see **Cellini** (Firenze 1857) and further, recipes XXXIV and XXXV. The printed text states, fol. 43v: *Mode facilissimo e bellissimo per far' Acqua da intagliare le piastre di Rame in vece di far col Bulino*, which gives the recipe for etching with salts in lemon juice or salts in vinegar, and fol. 44r: *Per fare acqua da partire*, which gives the recipe for nitric acid used in parting gold and silver; **Cellini** (Fiorenza 1568): fol. 43v–44r. Biringuccio knows nitric acid only as used for parting (*da partire*) gold from silver: *Lacqua acuta comvna da partire … lacqua acuta quale el vulgo chiama aqua forte comuna da partir loro dal arge[n]to*; *Biringuccio 1540*: fol. 64r–65r. A similar distinction between recipes for a mordant for etching (*Zu etzen*) and for parting (*Scheide Waßer*) is found in a manuscript containing art technological recipes owned by Dürer; *Sauer 2009*: 286 nos. 22, 23 (*Zu Etzen*): 287–288 nos. 40–45 (*Scheide Waßer*). Both mordants are found in tandem until long into the nineteenth century and can usually, although not always, be discerned by their different names. Macquer, for example, used the term *eau forte à couler* for the salts-in-vinegar solution that has to be poured (*couler*) over the plate and *eau forte de départ* for nitric acid; *Dictionnaire portatif 1766*, 1: 573.

623
Etching copper in a nitric acid bath colours the mordant bright blue due to the presence of hexaquo-copper(II) ions, a complex of Cu^{2+} ions and water. This continues up to the point that the bath is exhausted and has to be discarded; *Chomel 1743*, 2: 799.

624
According to Bosse, the salts-in-vinegar mixture 'does not lift the etching ground and is less detrimental to eyes and health than nitric acid' (*elle n'est point si sujette à faire esclatter le verni ny à plusieurs accidens, comme d'estre prejudiciable à la veuë & à la santé comme est celle de depart*); **Bosse** (Paris 1645): 46. Nitrogen oxide gases (NO_x) are nitric oxide (NO), which is a highly reactive free radical; nitrous oxide (N_2O), which is an anaesthetic; and nitrogen dioxide (NO_2), a brown gas and an air pollutant.

625
Tiquet (Antwerpen 1741): 89.

626
Condensation of two gases: $NH_4 + NO_x \rightarrow NH_4NO_2 + NH_4NO_3$.

627
Roller (Wien 1888): 70–71. This works for small plates in small baths. For larger plates the etcher needs to move the feather freely and a glass plate would obstruct him.

628
Melis Marini (Milano, 2nd ed., 1924): 45–46, *tav*. V.

629
See Chapter 2, p. 104.

630
Bosse (Paris 1645): 46.

631
See below under 'Modern developments – Mordants'.

632
A saturated solution of kitchen salt (one fifth in volume) in 8% vinegar takes a month to etch a modest relief in copper. The 8% vinegar alone produces a similar intaglio line in one year. Weaker vinegars merely have a matting effect during that period.

633
This depends on strength and ingredients. Ter Borch: 'if the nitric acid is very strong then a plate can be bitten in a quarter of an hour'; **Borch** (Zwolle 1635): fol. 1r. Biting takes two hours with the salts-in-vinegar mixture described by De Mayerne; **De Mayerne** (London 1620): fol. 34r, 36r. The nitric acid mentioned on fol. 35r is so strong that it needs to be diluted with water.

634
When a given volume contains more than 5% hydrogen gas it is flammable at room temperature; hydrogen gas is combustible at 400°C. Neither one is reached during the etching process.

635
See: Chapter 1, pp. 52 and 54.

636
Bruwaert 1914: 829, 835 (lists of supplied chemicals).

637
Beal 1984: 275; **Symonds** (Italy 1649–1651): fol. 128.

638
The first German translation after Bosse was published in Nürnberg in 1652, a year or two after Symmonds wrote his diaries.

639
Bosse mentions nitric acid in the introduction to his treatise stating that it can be bought from the refiners therefore he does not discuss it further on in his text where he gives details for making mordant from vinegar and salts; **Bosse** (Paris 1645): 2, 5.

640
Bosse (Paris 1645): 5, 11.

641
According to Bosse both Merian and Frisius used a soft etching ground and etched with nitric acid, while Callot etched on a hard ground with a salts-in-vinegar mixture; **Bosse** (Paris 1645): 2, see also pp. 5 and 45 for references to the *affineurs* who distilled nitric acid. Compare with *Bruwaert 1914*: 835 for Callot's use of the salts-in-vinegar mixture.

642
Bosse (Paris 1645): 30–31, pl. 6. How common this was is unclear. For example, Querfurt (1792) used the slanted board for etching with nitric acid; **Querfurt** (Wien 1792): 116–117. For the various methods by which a plate could be etched see below under 'Etching'.

643
Bosse (Paris 1645): 46.

644
Warren (1823): 94–95.
645
Turrell 2 (1824): 47–49.
646
Lupton (1823): 43.
647
Turrell 2 (1824): 47–49.
648
Caelator (1834); **Turrell 2** (1824): 51. Pine resin or colophony dissolves in both turpentine and alcohol.
649
Cooke (1826); **Humphrys** (1826); *Hunnisett 1980*: 48–49; **Turrell 2** (1824).
650
Deleschamps (1835); **Elsner** (1838); **Karmarsch** (1837).
651
Querfurt (Wien 1792): 140–141. Silver is higher up the voltaic scale and a solution of silver nitrate can therefore etch copper.
652
Waterhouse (1882): 247.
653
Bosse (Nürnberg, 1795–1796) 2 (1795): 72; *Demachij 1788*: 78 no. 7; **Gariazzo** (Turino 1907): 134, mentions silver nitrate for staining copper only, not for etching; **Hodson 2** (London 1805): 131; **Waterhouse** (1882): 167. After the actual etching and before cleaning off the ground, Stapart accentuates shading in his salt-grain aquatints with a silver nitrate solution; **Stapart** (Paris 1773): 67–68, 92–93. This is repeated in: **Compendium** (London 1797): 194–195.
654
We still find references to mordants for steel in later periods; **Gariazzo** (Torino 1907): 188–193.
655
Chattock (1880–1882) 3: 12; **Chattock** (London, 3rd ed., 1886): 40–41; **Denison** (London 1895): 70; *Hunt 1880*: 7; **Intaglio copper plates** (1888); **Preissig** (Leipzig 1909): 65–66; **Roller** (Wien 1888): 69–70; **Sanger Shepherd** (1895): 508; **Short** (London 1888): 15. For Talbot's invention of photogravure plates, see below under 'Photomechanical intaglio processes'.
656
For the chemistry of etching copper with ferric chloride see: **Hoskins & Pearce** (1995). See also **Kiekeben 1** (1997). **Thorstensen** (Oslo 1946): 56, is the only source for etching copper in a bath of 300 g aluminium chloride and 50 g ferric chloride in 1000 g water.
657
Talbot (1858). Ferric chloride does indeed work well on copper without producing gases (apart from a little hydrogen gas), but not on aluminium and zinc on which it bubbles strongly (chlorine smell) and heats the bath; **Howard** (Rochester 2003): 193.
658
Kiekeben 1 (1997). A year later Cedric Green published his 'Bordeaux Etch' (copper sulphate for etching zinc). He termed the solution thus in reaction to the 'Edinburgh Etch' (named after the Edinburgh printshop where it was first used) and because he lived in the neighbourhood of Bordeaux where copper sulphate was widely available used for treating mildew in the vineyards, see below under 'Modern developments – Mordants'.
659
Chromic acid is H_2CrO_4 or a solution of $K_2Cr_2O_7$ in diluted H_2SO_4; **Buonaccorsi** (1913): 14; **Hubbard 1** (Woodgreen Common 1923), note pasted in between pp. 2 and 3 or between pp. 48 and 49, depending on the copy; **Roller** (Wien 1888): 69; **Waterhouse** (1882): 246.
660
Chattock (1880–1882) 3: 15.
661
Peterdi 2 (New York 1980): 347.
662
Hydrochloric acid is HCl. Nineteenth-century English recipes often use the term 'muriatic acid' for hydrochloric acid. **Buonaccorsi** (1913): 15; **Deleschamps** (Paris 1836): 19–20, 23, 79–81.
663
Villon (Paris, 2nd ed., 1914): 170.
664
It is mentioned by **Ganz** (Philadelphia 1905): 113.
665
Chlorate of potassium is $KClO_3$. **Schwarz & Böhme** (1848).
666
For more varieties see: **Waterhouse** (1882): 247, recipe nos. 9–13.
667
New method of etching (1849).
668
Haden 1 (1866): 158.
669
Hamerton 1 (London, 3rd ed., 1881): 31 n.: 'This is what we call the Dutch mordant. I used to think that it was Mr. Haden's invention, but it has been used in Holland for some time and was probably invented there.'
670
Waterhouse mentioned Schwarz and Böhme, but did not know the primary source or the first English reference; **Waterhouse** (1882): 246.

671
Rops (1873–1894): 5, 15 ff. (transcription pp. 48, 53 ff.).
672
Short (London 1888): 15.
673
Zinc, for example, is etched in a less concentrated solution than copper.
674
Hydrogen peroxide is H_2O_2. **Barff 1** (1876); **Barff 2** (1884).
675
Iodine of sodium is NaI, iodine of potassium is KI. **New method of etching** (1849); **Schwarz & Böhme** (1848) also explained how to regenerate the bath because iodine was expensive.
676
Rops (Paris 1873–1894): 18, 41 (transcription pp. 55, 69).
677
Diluted sulphuric acid (H_2SO_4) can be used to clean off stains on copper plates; **Hollenberg 2** (München 2008): 56, 178. Note: sulphuric acid is extremely aggressive to eyes and skin.
678
Franklin (1996). It is chemically possible to etch zinc with weak sulphuric acid, but there are no references that this was practised for printing plates; **Deleschamps** (Paris 1836): 23.
679
Lucca 2003: 102–103 no. 65, Biblioteca Capitolare, Lucca, Ms. Codex 490, c.800: fol. 221v, uses *dracantum*. *Smith & Hawthorne 1974*: 64 no. 245; Bibliothèque de la Ville de Sélestat, Ms. 17, ninth century: fol. 53r. See further Chapter 1, p. 49.
680
Some of the earliest recipes are: British Library, London, Ms. Sloane 416, 1424–1456: fol. 135v; Bibliothèque National, Paris, Ms. Graecus 2327, 1478: recipe no. 18; *Eastlake 1960*, 1: 93; *Harzen 1859*: 124 n. 16; *Wolters 2006*: recipe no. 18.
681
Some authors specify the use of red or green wax that have the soft and sticky qualities needed. Note that sealing wax has different ingredients, is hard and brittle due to the added resin and is therefore not suitable for the purpose.
682
Bishop (Philadelphia 1879): 7.
683
Bosse (Paris 1645): 45; **Bosse** (Amsterdam 1662): 65; **Roller** (Wien 1888): 65; **Verheijden** (Den Haag 1736–1739): 146.
684
Janssen et al. 2010: 152–153, 162–163, figs 15, 16; **Schoonebeek** (Amsterdam 1698): 22, with fig.
685
Janssen et al. 2010: 154, 163, fig. 17; **Schoonebeek** (Amsterdam 1698): 22–23, with fig.
686
Schellenberg (Winterthur 1795): 35–36.
687
Palomino places the plate diagonally in a tub above the liquid and ladles the acid over it; **Palomino de Castro y Velasco** (1715, 1724) 2: 332, with fig. Schellenberg uses a tray on two feet in the middle that can be tilted on either side in order to allow the mordant to run from left to right and back; **Schellenberg** (Winterthur 1795): 35, *Tab*. I, fig. 4.
688
Bosse (Paris 1645): 28–29, 30–33, pl. 6–7; *Berger 1901*: 166–167, ms. fol. 36r–v. The technique was also known in Italy at the time; **Mariani** (Padua 1623): fol. 102r–v, with fig. The recipe describes almost the same technique as Bosse and De Mayerne (*Berger 1901*), although in different terms, which could mean that the technique was fairly well known. Compare with the prescription for etching decorations on knives and armour; *Vandamme 1974*: 121, ms. fol. 22r. See Chapter 1, p. 49. **Filleau des Billettes** (Paris 1693–1698), plate showing engravers and etchers at work.
689
Smith et al. 1951: 228–232; **Thorstensen** (Oslo 1946): 185–188.
690
Querfurt (Wien 1792): 116–117.
691
Bosse (Paris 1701): 31–32, including an illustration of how to use an acid tray; *De Furno 1531*: 226. Apparently using a tray for etching was not common knowledge because Hamerton calls it 'a modern improvement'; **Hamerton** (1866): 296.
692
Bosse (Paris 1701): 31, fig. opp. p. 31.
693
Bosse (Nürnberg, 1795–1796) 1 (1795), vignet on p. 317; **Querfurt** (Wien 1792): 116–117; *Von Heinecken 1778*, front.
694
Diderot & D'Alembert 1751–1781, Planches, quatrième livraison, ou cinquième volume (1767), *Gravure en taille-douce, en manière noire, manière de crayon, &c*: 6–7, pl. VI.
695
Smith et al. 1951: 166–167, fig. 110.
696
Harris 1968–1970: 6: 77. English patent A.D. 1840.–No. 8656; not in *Woodcroft 1969*. Thomas Spencer and John Wilson, *Certain improvements in the process of engraving on metals by means of voltaic electricity*; for the full text see:

http://www.greenart.info/galvetch/contfram.htm (2010), Appendix B, further literature with 'Notes & References'.

697

See below under 'Electrotype' and above under 'Steelfacing'.

698

Green (Cedric; Sheffield, 4th ed., 1999): 19–20; http://www.greenart.info/galvetch/contfram.htm (2010), 'A Short History of Electrolytic Printmaking'.

699

Aagaard (Kjøbenhavn 1894); **Chattock** (1880–1882) 3: 15, cited after Cooley's 'Cyclopaedia of practical receipts'; **Gross** (London 1970): 160–161, under the heading 'Electro-polishing'; **Hayter** (New York, 3rd ed., 1981): 99, 2nd col.; *Smith et al. 1951*: 232–236, for relief printing plates; **Streubel** (Leipzig 1955): 215–216; *Van Huffel 1934*; *Walker 1841 & 1843*, 2; *1856*: 98–103, 229–230; **Waterhouse** (1882): 247. Electrolytic etching is used in the industry for marking metals; http://www.lectroetch.com/ (2010).

700

Osann (Würzburg 1842).

701

Personal correspondence with Nik Semenoff in 2002.

702

See Chapter 1, p. 52.

703

Riggs 1977: 128.

704

Augustin Hirschvogel, *Konkordanz und vergleychung des alten und newen Testaments* (c.1550). First stage before the etched text was added; the text edition published: Wien: Egidius Adler, 1550.

705

Giovanni Battista Pittone, *Praecipua aliquot Romanae antiquitatis ruinarum monimenta, vivis prospectibus, ad veri imitationemen affabre designata*, Venetia: Pittone, 1561.

706

Janssen et al. 2010: 154–155, 163, fig. 18.

707

Riggs 1977: 142.

708

Scenographiae, sive perspectivae, Hans Vredeman de Vries inventor, etched by the Van Doetechum brothers, Antwerpen: Hieronymus Cock, 1560; *Hollstein Dutch & Flemish*, 47–48: nos. 30–50.

709

The text first gives a recipe for etching ground before discussing the acid: *neemt dan teghen vijff delen starck water // Een deel regenwater die is om de voorgronden // Nae te bijten ende daer naer nemt dat selfee // Water teghen een del puer water*, probably either for biting the rest of the plate or for the background; **Etching ground** (Southern Netherland, 1600–1625). Information kindly supplied by Hans Buijs of the Fondation Custodia, Paris, personal correspondence in 2005.

710

See below under 'Photogravure'. Earlier etchers probably used such a system occasionally but I have not found any reference to it.

711

Chattock (1880–1882) 3: 4; **Haden 1** (1866): 158–160.

712

Bosse (Paris 1645): 48–49; **Roller** (Wien 1888): 105–108.

713

Denison (London 1895): 109–113.

714

Bishop (Philadelphia 1879): 18.

715

Hassell 1 (London 1811): 29–31. See also: **Engraved on steel** (1866): 375, although the author has the whiting paste removed before the ground is applied.

716

Hayter (London 1949): 81–82.

717

Corrections can be made by scraping off the particular area. If the plate becomes too indented it can be hammered from the back to achieve a level surface again; see also above under 'Engraving', at the end of the section.

718

For modern discussions on the topic see: *Griffiths 1987*; *Wiebel 2007*, reviewed in *Griffiths 2008*. Both with further literature. The primary study on aquatint prints was published by Prideaux in 1909, repr. 1968; *Prideaux 1968*. *Wiebel* also contains a chapter by Wolfgang Schwahn with comments on his reconstructions of the most well-known historic aquatint techniques (*Wege und Irrwege – Technische Versuche einer Annäherung an die historischen Verfahren zur Erzeugung von Flächentonen im Tiefdruck*: 42–63).

719

Bialler 1995: 30–34, 54–63, 68–77, 209–211. For the combination of intaglio and relief printing, see Chapter 4, p. 366.

720

For more information on printing ink see Chapter 4, p. 267.

721

Venus and Amor Playing the Lute, Daniel Hopfer, etching on iron, B. 46, *Hollstein German*, 13A: no. 54. Study sheet with five figures (*Der Verzweifelnde*), Albrecht Dürer, c.1515, etching on iron, B. 70. *Cleopatra Kills Herself with the Snake*, Augustin Hirschvogel, *Hollstein*

German, 13A: no. 63.

722

See above under 'Mechanical Procedures – Tone'. Similarly rendered is the angel in a *Saint Lawrence* after Adam Elsheimer etched by Pieter Claesz. Soutman (1580–1657), *Hollstein Dutch & Flemish* 27: no. 10.

723

New Hollstein Dutch & Flemish (Simon Frisius): no. 11.

724

Ackley 1981: xix–xxiii.

725

Hind 1963-1: 291–299.

726

Stapart (Paris 1773): 6.

727

For a recent discussion on terminology see: *Wiebel 2007*: 32–35.

728

Direct etching: flat bite in English (American), *wild bijten* in Dutch, *(manière) lavis* in French, *Blindätzung*, *Direktätzung* or *Pinselätzung* in German. Cf. below: Lift-ground.

729

Braun (Augsburg 1973): 42–47, note the microscopic enlargements of etched iron surfaces.

730

Aluminium will stand a few dozen impressions depending upon hardness; with thanks to Charles Morgan for running tests. Iron is harder and tones etched in iron may even last for a few hundred impressions.

731

See Chapter 1, p. 52.

732

Reed & Wallace 1989: 9 no. 4. The fine textures show he worked on copper. Tonal effects that look like direct etching are occasionally observed: *Cohn 1996*: 552, fig. 3 (Claude Lorrain); *Griffiths 2004-2*: 92, fig. 83 (Abraham Genoels); *Rodari 1996*: 44 (Stefano della Bella).

733

Hollstein Dutch & Flemish, 8: 171 no. 7.

734

Roethlisberger 1987. One iron plate is kept in the collection of the British Museum, Dept. of Prints & Drawings, London.

735

Bylaert (Leiden 1772): 48, 50, 55, 57.

736

Stapart (Paris 1773): 63. Paul Sandby did not want to disclose any details of his working practices in aquatint to John Clerk of Eldin, but let it be known that 'Iron you may operate upon with a hair pencil after the out line is etch'd with great ease', by which he means brushing the iron with acid; *Hardie 1933*: 363; **Sandby** (London 1775).

737

Sandby 1 (London 1775).

738

Tischbein (Cassel 1790): 19.

739

For etching copper with silver nitrate see above under 'New mordants for copper'.

740

Preissig (Leipzig 1909): 61–62.

741

Hayter (London 1949): 79

742

Ross & Romano (New York, 3rd ed., 1972): 107–108. This is, of course, similar again to mixing a mordant with a gel as already described in the Lucca Ms (c.800); see above under 'Line – Etching methods'.

743

Querfurt (Wien 1792): 141–142.

744

Schwegmann recommends two mixtures. The first is gunpowder in olive oil, the gunpowder being a mixture of saltpetre, charcoal and sulphur. The second is a mixture of sulphur and vermilion in olive oil; **Schwegman** (Haarlem 1806): 7–8. In both cases the copper is corroded by the sulphur components. For a specimen see: **Short** (London 1888): pl. 3 no. 7.

745

Griffiths 1987: 257; *Rebel 1981*: 46–50, nt. 2; *Wiebel 2007*: 97–103.

746

Adeline (Paris 1894): 63–65; **Catafal & Oliva** (Barcelona 2002): 80–81; **Compendium** (London 1797): 194; **Green** (J.H.; London, 2nd ed., 1804): 9–10; **Hodson 2** (London 1805): 131; **Lalanne** (Paris 1866): 74–75; **Paton** (1892–1894) 3 (1893–1894): 41–43; **Paton** (London, 2nd ed., 1909): 102–103; **Preissig** (Leipzig 1909): 61; **Short** (London 1888): 32–33, specimen on pl. 3 no. 7.

747

Green (J.H.; London, 2nd ed., 1804): 9.

748

Rovinskij 1890–1914, 1: VII, referring to B. 42, 43, 86-III, 218, 280, see col. 26, 116, 141.

749

Ivins 1958: 57.

750

Stijnman 1999: 29–31. Modern printmakers take advantage of the effect and use special semi-resistant etching grounds to enhance it, see below under 'Modern Developments – Etching grounds'.

751

Laurentius et al. 1980: 199–212, 242–251.

752

Ibid., 255–284, 287–289.

753

Ibid., 112.

754

Meusel 1783: 316 (*Geheimniß*); *1788:* 56 (*Geheim*); **Tischbein** (Cassel 1790): 5 (*unbekannt*). A recording of his process, without technical specifications, is found in a certificate signed by two mayors of Amsterdam and three representatives of the Maatschappij der Wetenschappen in Haarlem from 1768. They attended a demonstration of the process and declared that Ploos van Amstel did not make etchings with a needle, but with 'certain varnishes, powders and liquids'. He printed in colours with 'oilpaint' and did not apply hand-colouring; *Clifford et al. 1768*; *Laurentius et al. 1980*: 119–120, 226–231, 281–282.

755

Laurentius et al. 1980: 113.

756

Fokke (Dordrecht 1796): 350–352.

757

The archives of Cornelis Ploos van Amstel are kept in the library of the Rijksmuseum, Amsterdam.

758

Laurentius et al. 1980: 198–208.

759

Tischbein (Cassel 1790): 12–13.

760

Paton (1892–1894) 3 (1893–1894): 14. See also: **Koehler** (New York 1885): 214; **Short** (London 1888): 31, specimen pl. 8 no. 4.

761

Holleman (Utrecht 1927); *Spijk & Hofsteenge 1996*: 44–49. For a much coarser, modern version see: **Adam & Robertson** (London 2007): 125–126.

762

For later aquatint plates De Saint Non used dust-grain aquatint (see Fig. 208, p. 262).

763

Stapart (Paris 1773).

764

Querfurt (Wien 1792): 134–142; **Tischbein** (Cassel 1790): 15–16.

765

Fokke (Dordrecht 1796): 356–357. Schwegman knew Stapart's technique, but did not use it; **Schwegman 2** (Haarlem 1806): 5

766

Schwarz (Nürnberg 1805): 3–5.

767

Adam & Robertson (London 2007): 126–127; **Loudon** (1998).

768

Stijnman 1991-2: 156, 159–160, 162. The portraits are of Queen Christina of Sweden, Oliver Cromwell, Hermannus Langelius, and one of an unknown elderly man. For further details on the last plate printed in red and black, see Chapter 4, p. 358.

769

Griffiths 1987: 260–262; *Wiebel 2007*: 151–163. Perhaps there is a connection with the use of 'pounce' that was dusted onto freshly written text. Various materials were in use, including finely pulverised colophony resin.

770

Le Prince 1 (1769); *Meusel 1781*.

771

Le Prince 2 (1771).

772

Le Prince 3 (1780): 92.

773

Le Prince (Paris 1780); *Meusel 1781*.

774

Courboin 1914: 54; *Griffiths 1987*: 260; **Le Prince** (Paris 1791) 1: 622–625. Le Prince's manner was already known in England by that time as evidenced by Robert Adam's letter of 1782 to John Clerk of Eldin that includes a description of the process; **Adam** (S.l. 1782); *Griffiths 1987*: 270. Schwarz mentioned he bought (a copy of) the text of the treatise together with some Swiss artists; **Schwarz** (Nürnberg 1805): 4.

775

Le Prince (Paris 1788–1791) 1 (1788): 622–625. A comparable technique was invented by Joannis Jacobus Bylaert years before; see above under 'Direct etching'. However, unlike Le Prince, Bylaert does not use any intermediate grain – the bare copper is etched directly without any further resist; **Bylaert** (Leiden 1772): 48, 50, 55, 57.

776

Wiebel 2007: 255. Another group of aquatinters was active in Leipzig; *Griffiths 1987*: 269; *Rebel 1981*: 61–65.

777
German expatriots working in Paris kept in touch with befriended engravers in Germany; *Wiebel 2007*: 258. Etchings with dust-grain aquatint appeared in Denmark, Italy and Spain (Goya) from the late eighteenth century; cf. **Ducross** (Rome 1785). See n. 818.

778
Griffiths 1987: 263; *Hopkinson 2008*: 132; *Wiebel 2007*: 187–199. Detailed descriptions of the dust-grain technique appear in German manuals only after 1800; **Henrici** (Leipzig 1834); **Meynier** (Hof 1804); **Schwarz** (Nürnberg 1805).

779
Schwarz (Nürnberg 1805): 3.

780
Stapart (Nürnberg 1780): 3.

781
Schwarz (Nürnberg 1805): 3–4.

782
Ibid., 81–83, *Tab.* III and IV.

783
Meynier (Hof 1804): 165–169, *Tab*. XI.

784
Green speaks of 'a hair-dresser's powder machine', probably a pair of bellows; **Green** (J.H.; London 1804): 8, **Jacque** (1851): 332, fig. 18.

785
Adam (London 1782); **Compendium** (London 1797): 195–198; **Francis** (1842) 3 (1842): 292; **Green** (J.H.; London, 2nd ed., 1804): 7–10; **Sadler** (Liverpool 1780).

786
Hind 1963-1: 303; *Hopkinson 2008*: 132–133; *Wiebel 2007*: 196–197. Something of Sandby's experimentation is reflected in his letter to John Clerk of Eldin, where he vaguely refers to it, but despite their friendship he did not wish to disclose technical details to Clerk; *Hardie 1933*: 363; **Sandby 1** (London 1775). According to Hayes, Burdett might have communicated his method to Thomas Gainsborough as well as there is a resemblance in grain quality and a difference in the appearance of the grains in Sandby's prints; *Hayes 1971*: 12.

787
Griffiths 1987: 265–268. Sandby left a manuscript containing detailed instructions of his technique; *Griffiths 1987*: 269–270; *Hind 1963-1:* 303, n. 3; **Sandby 2** (London 1801). A modern reconstruction showed effects similar to those in his prints; *Mackay 1987*.

788
Compendium (London 1797): 198–199. Others followed in the nineteenth century: **Alken** (London 1844): 44–47, pl. 6–9; **Fielding** (London 1841): 40–45, with two specimens; **Green** (J.H.; London, 2nd ed., 1804): 3–7, with a specimen; *Landseer 1807*: 133–135.

789
Partington (1826): 312.

790
Ibid., 338.

791
Ibid., 312. More than half a century after its invention Fielding still remarked about how difficult it was to apply liquid-grain aquatint; **Fielding** (London 1841): 43–45.

792
For steel engraving see above under 'Iron and steel' and 'Chemical Procedures – Etchant/Mordant'.

793
Netto 2 (Quedlinburg 1840): 37. Jean Baptiste Grateloup may have used aquatint on steel in the period 1765–1770; *Prideaux 1968*: 72–73. English steel engravings with aquatint can be found with the Daniels: *Ford & Ford 1981*: 309 no. 554: 310 no. 566; *Sutton 1954*: 88. One other example is: W. Read after Rembrandt van Rijn, *The Philosopher*, London: E. Lacey, (1825–1830), etching with aquatint on steel, with hand-colouring. From the year 1839 the French magazine *L'Artiste* is illustrated with etchings on steel (*sur acier*, in the address of the plate) with occasionally plates with aquatint and soft-ground; *L'Artiste*, 2nd series, 3 (1839), pl. opp. pp. 32, 49, 64, 80, 96, 116, 156, 157, 276. French instructions for liquid-grain aquatint were published shortly before: **Deleschamps** (Paris 1836): 71–72; **Perrot** (Paris 1830): 122–123.

794
Lerebours 1841–1844. For a discussion on the series see: *Broos 1970*; *Buerger 1989*: 27–49, 178–179 (notes), 246–250 (catalogue of the series).

795
Lerebours 1841–1844, Avis de l'éditeur: [1]: ◄ *l'aqua-tinte est le genre qui ressemble le plus à la nature, qu'on s'y est arrêté. On a choisi l'acier* [sic!] *pour base du travail, parce qu'il permet d'unir la finesse à la solidité*.

796
Manier om op de Engelsche wijze in het koper te graveeren, door hun genoemd 'acqua tinta'; **Maaskamp** (Amsterdam 1810).

797
Dust-grain aquatint was used in the Netherlands then, but only by Friedrich Christoph Dietrich and Ludwig Gottlieb Portmann, both of whom trained in Germany.

798
Guérin 1945: 53.

799
For photogravure see below under 'Photomechanical intaglio processes'. English etchers in the earlier twentieth century still maintained a practical knowledge of the liquid-grain technique; **Emanuel** (London 1930): 152–153; **Lumsden** (London 1924): 119; **Paton** (London, 2nd ed., 1909): 96–97; **Plowman** (London 1922): 113; **Robins** (London 1922): 194–195. Morrow's monograph on aquatint explains that dust-grain was considered standard by then; there were also other methods; **Morrow** (New York 1935): 59–67. This is still the current situation

although there has been a shift towards sprayed aquatints. Liquid-grain aquatint is rarely found nowadays. Stochaistic screens replacing dust-grain aquatint are used in photomechanical intaglio processes.
800
Stijnman 1995: 42.
801
See portraits with dust-grain aquatint etched by Petrus Johannes Arendzen in: G.L. Kepper, *De regeering van koning Willen den Derden*, Groningen: J.B. Wolters, 1888. Only a few references to, or prints with, liquid-grain aquatint are found in the twentieth century; **Buckland-Wright** (London 1953): 114, 129; **Heller** (New York 1958): 151, 248, fig. III-38; **Thorstensen** (Oslo 1946): 69.
802
Denison (London 1895): 51–52, in discussing a ground for photogravure. For a second reference see: **Preissig** (Praha 1909): 52.
803
Maxwell (Englewood Cliffs 1977): 49.
804
Preissig 1 (Leipzig 1909): 50, 52.
805
Béguin (Bruxelles 1975).
806
Adams & Robertson (London 2007): 130–131; **Bøegh** (Copenhagen 2003): 24–29.
807
The following text on 'lift-ground' is a revised version of *Stijnman 1996-2*; **Howard** (Rochester 2003): 211–226.
808
Fielding (London 1841): 50–51; **Francis** (1842) 3 (1842): 331–332; **Perrot** (Paris 1830): 122. The description Hoffman gives of his 'polytypie' is vague, but does suggest that it is a kind of lift-ground; **Hoffman** (1794). See also above, p. 210.
809
Van Leusden 1960: 12–13, 15, 18–19.
810
Francis (1842) 3: 292. Oil of lavender or turpentine oil is used for lift-ground on dust-grain aquatint.
811
Hassell (London 1811); **Hassell** (*Journal*) (1811): 225; **Hassell** (*Transactions*) (1811): 102. The technique is reproduced without reference, in: **Francis** (1842) 3: 398–399.
812
Hullmandel (1840).
813
Hammann 1857: 223–224; **Jaque** (1852): 333. A variety called the 'pen-method' (*procédé à la plume*), using plain ink instead of a sugar solution, was developed by Félix Bracquemond in 1863, described by Lalanne and refined by Felicien Rops from 1888; *Bouillon 1974*: 3–11, with a letter from Rops to Bracquemond of early 1864, explaining that his recipe did not work; **Lalanne** (Paris 1866): 80–81; **Rops** (Paris 1873–1894): 3 (transcription p. 47).
814
Lalanne (Paris 1866): 80–81. Compare with the direct etching methods described above.
815
Le Prince also applied a sugar solution to the plate for his aquatints but not as a lift-ground – instead the sugar was used to make the powdered resin stick to the surface but not to lift anything on top of it because the ground was removed from the plate where a tone would be etched; **Le Prince** (Paris 1791): 624.
816
Stangos 1978: 287–288, 293–294.
817
First reviews of Le Prince's prints using his new technique appeared in German journals in 1770 and experiments by German engravers using the tonal intaglio technique also started about that time; *Rebel 1981*: 59–65.
818
Further dissemination of aquatint techniques: Italy, first aquatints by Giovanni David dated 1775; *Wiebel 2007*: 282–292. Spain (Goya), around 1790; *Wiebel 2007*: 307. Denmark in 1798; *Griffiths 1987*. Other European countries followed after 1800. The first aquatints that appeared in the USA were by Edward Savage in 1799; *Shadwell 1969*: 46, pl. 86–87.
819
Spilsbury (London 1794): 4, 18–22, pl. 3 has specimens of six different aquatint grounds. **Green** (J.H.; London, 2nd ed., 1804).
820
Fokke (Dordrecht 1796): 350–358.
821
Compendium (London 1797): 193–201.
822
Schwegman 2 (Haarlem 1806): 4–7. As mentioned above, the transfer process had already been published ten years before though; **Fokke 1** (Dordrecht 1796): 350–352.
823
Green (J.H.; London, 2nd ed., 1804). Pl. II has specimens of 12 mixtures of liquid-aquatint grains.
824
Green (J.H.; London, 2nd ed., 1804): V.
825
Reproductions can be so precise that even the laid texture of the paper of the original drawing can be rendered; **Fokke** (Dordrecht 1796):

351–352.

826

Hind 1938–1948, 2: 219 nos. 7, 8.

827

Ploos used crushed and sieved potsherds, but also other hard powders; *Laurentius et al. 1980*: 245–247, test 13. The potsherds powder was also used for cleaning silver and may have been commercially available; **Laer** (Lochem 1967): 116. Fokke mentioned that copper filings are used; **Fokke** (Dordrecht 1796): 350. Netto took glass powder; **Netto 2** (Quedlinburg 1840): 34.

828

Fokke (Dordrecht 1796): 350–352; *Herold 1931*: 23–30, cat. no. 110, fig. 71; *Laurentius et al. 1980*: 199–212, 242–251. Ploos van Amstel swore his assistents to secrecy and he himself never divulged his technique apart from a demonstration to a scientific committee, whose report does not give any details; *Clifford et al. 1768*. François never taught it to his apprentices – only his wife seems to have known about it but she also kept it to herself; *Herold 1931*: 23, 30.

829

See above, p. 209.

830

Tischbein (Cassel 1790): 12–16.

831

Netto 2 (Quedlinburg 1840): 35.

832

The following text on soft-ground etching is a revised version of *Stijnman 1997-2*.

833

Stijnman 1991-1

834

Hardie 1933; **Sandby 1** (London 1775).

835

Green (J.H.; London, 2nd ed., 1804): 2, 24.

836

Lambert 1987: 139, figs 122, 123, 123a.

837

Stokes 1929. John Hassell was not happy with soft-ground etching because plates never yielded more than 200–300 impressions. Instead he developed his own technique, as described above under 'Lift-ground'; **Hassell** (London 1811); **Hassell** (1811).

838

Hind 1921: 381.

839

Hind 1963-1: 240–242. One of the earliest artists to use soft-ground, also adding liquid-grain aquatint, was Thomas Gainsborough; *Hayes 1971*: 15–18.

840

Stijnman 1991-1: 28–29. The first state of the set is in soft-ground only, the second and final state has dust-grain aquatint added by Timothy Sheldrake.

841

Prideaux 1968: 93.

842

Collection de gravures dans la manière du crayon, dessinées aux amateurs et artistes qui desirent se livrer à l'étude du paysage, 60 plates in which Jaques Couché was also involved. Later the series was enlarged to 90 (?) and published in 1803: *Recueil de paysages, enrichies de figures et animaux*; *Nagler 1835–1852*, 19: 481. I have seen nos. 78 and 80, which are from the *Recueil*. Both these prints are in soft-ground only.

843

Bénézit 1966, Philibert-Louis Duboucourt, Oeuvre gravé, d'après M. Fenaille: no. 156, *La Course, d'après C. Vernet*. The same mixture in *Cheval Arabe conduit par un Mameluck* (no. 398) and *Cheval Russe conduit par un Cosaque* (1818? no. 399).

844

Bagelaar (Haarlem 1817): 10–11.

845

This 'Cyclopaedia; or, Universal Dictionary of Arts, Sciences and Literature' was an American edition of the English one, issued by Samuel Bradford in Philadelphia in 1810–1822; *Larson 1982*: 39–49: 44 and fig. 20 concern soft-ground.

846

Volume 43 of the *Cyclopaedia* is not dated, but since Charles died in Philadelphia in 1820 he must have made the plates shortly before.

847

Roundell 1974: 39, 110–111.

848

Fielding (London 1841): 27–28, with a specimen.

849

Jacque (1852): 372–373; **Lalanne** (Paris 1866): 77–79; **Perrot** (Paris 1865): 126–127. Various examples of soft-ground on steel instead of copper can be found in the magazine *L'Artiste*, from the 3rd volume onwards; *L'Artiste*, 2nd series, 3 (1839), pl. opp. pp. 32, 49, 64, 80, 96, 116, 156, 157, 276.

850

For prints by Charles François Daubigny with a fine textile texture (*à la cravatte*) see Delteil nos. 64-III, 76-IV, 77-II. Earlier, Green suggested that 'fine silk, linen, or gauze placed between the paper and the plate, will give the work a curious effect'; **Green** (J.H.; London, 2nd ed.,

1804): 24.

851

Delâtre (Paris 1887): 26–28.

852

This is visible in his print *La petite liseuse* (c.1880), in which we can see parts of plants, an insect and a lizard skin (?); **Delâtre** (Namur 1986): 88 no. 81/261; **Ziegler** (Halle a.d. Saale, 2nd ed., 1912): 209, for a prescription

853

Ziegler (Halle a.d. Saale, 2nd ed., 1912): 212–214.

854

Guérin 1945: 47–49, 53. See prints with soft-ground by Mary Cassatt, Edgar Degas, Camille Pissarro and Auguste Renoir.

855

See prints with soft-ground by Henri Delavalee and Armand Seguin; *Boyle-Turner 1986*: 77–79, 89, 98–99.

856

See also below under 'Artists' reactions'.

857

Armand Rassenfosse 2005: 78–79; *Rouir 1984*: 11, column 2. Rops often mentions his *Vernis Fély* in his notes, but does not give a recipe nor does he mention the final version of the *Ropsenfosse* in 1892; **Rops** (Paris 1873–1894): 54–55, 80 (transcription).

858

Rouir 1984: 12.

859

Ibid.,16–17; *Schaar & Hopp 1977*: 143 fig. 197.

860

Felsing (Berlin 1920); **Saez de Alamo** (Bilbao 1989); **Ziegler** (Halle an der Saale 1917): 57–68, especially pp. 64–65.

861

Hartley 1988: 252; *Stangos 1978*: 288, 293; *Stevens 1977*.

862

See Chapter 2, p. 89.

863

Giltay 1977: 91, 92, 96.

864

Carey & Griffiths 1984: 75.

865

The first practical description is in German: **Ziegler** (Halle a.d. Saale, 2nd ed., 1912): 203–214, 315. Danish artist Carl Locher studied in Berlin (1892–1896), became interested in soft-ground and showed three prints in this technique in Copenhagen a year later; personal correspondence with Hans Dam Christensen in 1990.

866

Hind 1963-1: 338; *Spence & Chin 1996*: 83, 106–107.

867

Lalanne (Boston, Mass, 1880): 52–53.

868

Hunt 1880: 10.

869

Hendriks (Alkmaar 1944): 6, 43. The quote is from: **Rhead** (London 1890): 77. Compare the following paragraph with (above) 'Mechanical Procedures – Modern developments'.

870

Lalanne (Paris 1866): 75–76, pl. 5 fig. 2.

871

Short (London 1888): 31–32, pl. 3 fig. 5. Foul biting is the base for Rembrandt's plates with tonal effects, see above under 'Sulphur tint'.

872

Roller (Wien 1888): 132–133.

873

Koehler (New York 1885): 214.

874

Fraipont (Paris 1897) 4: 41.

875

Rauscher (Budapest 1933), especially p. 11.

876

Holleman (Utrecht 1927); *Spijk & Hofsteenge 1996*: 44–57. Perhaps the only one to try some of Holleman's techniques was Nicolaas van Huffel, the editor of his manuscripts (p. 55).

877

For Hayter and his Atelier 1*7* see Chapter 2, p. 89.

878

Silsby (New York 1943); **Sternberg** (New York 1949).

879

Hayter (London 1949): 202–204, the others are Callot, Rembrandt, Piranesi and William Blake. For Segers's influence on Netherlandish etchers in the period 1900–1970 see: *Duister 1976*: 25; *Filedt Kok 2011*; **Janssen** (Rotterdam 1966): 76–77; *Rademaker 1978*: 5–6, 8–9; *Roodenburg et al. 1993*: 32–33. Willem Van Leusden and Laurent Verwey van Udenhout tried to reconstruct Segers's techniques in the

early twentieth century. Verwey died young in 1913 and Van Leusden continued research only from 1947; *Adelaar et al. 1990*: 59–62, 171–174; *Van Leusden 1960*.

880

Hayter (London 1949), especially p. 275. Compare Hayter's technical manual with its companion volume 'About prints', which describes printmaking in a more general way for an interested audience, ie it does not contain instructions for printmaking; *Hayter 1975*.

881

Hayter (New York 1981): 5–6.

882

Peterdi 2 (New York, rev. ed. 3rd pr., 1973): 154, 193, 244, 246.

883

Edmonson (New York 1973): 131.

884

Preissig (Praha 1909): 56–57.

885

Morrow (New York 1935): 89–96, pl. 21, 31, 33, 34, see pp. 94–95 for Frank Nankivel; **Ziegler** (Halle 1912) 1: 201–202.

886

Leaf (New York 1976): 58–59; the formula was published in Artist's Proof but no date is given. This white ground should not be confused with the white coating on top of an etching ground used in transferring designs, see above under 'Tracing'.

887

Leaf (New York 1976): 106–113.

888

Applying sticky foil to the back of plates was already common in Japan in the 1980s and used by some individuals in Europe; **Lehtinen** (Helsinki, 2nd ed., 1997): 49.

889

Green (Cedric; Sheffield 1999): 34–35.

890

Howard (Grande Prairie 1998): 206–222.

891

Zaffron 2 (1996).

892

http://www.lascaux.ch/en/produkte/druckgrafik/index.php (2010).

893

Eder 1922: 10, in the context of photomechanical processes; *Van Huffel 1930*: 280. Mixtures of copper sulphate with various other constituents are recorded for etching zinc relief plates (zincographic etching, photozincography); **Waterhouse** (1882): 371.

894

Green (Cedric; Sheffield, 5th ed., 1999): 35–38.

895

Semenoff & Bader (1998). A plain copper sulphate solution does not work on aluminium, but adding just a pinch of kitchen salt starts the reaction. Some sodium bisulphate ($NaHSO_4$) or sulphuric acid is added to prevent gel forming.

896

Personal correspondence with Nik Semenoff, 6 April 2002.

897

Green (Cedric; Sheffield, 4th ed., 1999): 35–38; **Stijnman 3** (1999).

898

http://frank.mtsu.edu/~art/printmaking/wwwboard/index.html (no longer accessible). This was the oldest (est. 1998?) and busiest online discussion list for printmakers until it had to close down in 2005 due to hacking and spam attacks.

899

See Chapter 1, p. 48. **Waterhouse** (1882): 167, recipe nos. 20, 21, 22.

900

Kiekeben 2 (2004); http://www.nontoxicprint.com/etchzincsteelaluminum.htm (2010). Kiekeben also coined the term 'Edinburgh Etch', see above under 'Acid'. Etching steel with a solution of equal amounts of copper sulphate and kitchen salt was developed independently by Charles Morgan; personal correspondence, 9 December 2008. For etching aluminium with this solution see: **Brown 2** (2008); **Mora Peral 2** (2007); **Wray 2** (2007).

901

Bytautas 2 (2009); **Semenoff 1** (2009); **Semenoff 2** (2009). The idea was developed by Nik Semenoff in 2008, who discussed it with me; personal correspondence, 15 February 2009. Semenoff further discussed the mordant with Alfons Bytautas, who carried out a series of tests. Cupric chloride had already been mentioned as a mordant for aluminum or zinc; **Gross** (London 1970): 67; **Lehtinen** (Helsinki 1992): 54; **Russ** (New York 1975): 113; **Silsby** (New York 1943): 7–8. Krejča mentions a solution of 16 g copper sulphate and 8 g potassium chlorate in 100 g water to make a preliminary drawing on zinc by painting the solution directly onto the zinc. The chemical reaction is immediate and a coating of black copper oxide is formed; *Krejča 1991*: 118.

902

Behr & Behr 1 (1991); **Behr & Behr 2** (1993); **Behr & Behr 3** (1994-1); **Behr & Behr 4** (1994-2); **Semenoff & Christos** (1991).

903

US patents 5 102 520 (Electroetch), 5 112 435 (Microtint), European Patent application 92 900 405.9 pending.

904

Green (Cedric; 1998-1).

905

Behr 5 (1998); **Green 1** (Cedric; 1998-2); **Behr & Behr 6** (1998); **Green 2** (Cedric; 1998-2). Green published his research into the technique and the history of the technique of electrolytic etching in the fourth edition of his manual (1999), to support his claim 'that the process is in the public domain, and can be used freely without payment'; personal correspondence, 16 January 1999; **Green** (Cedric; Sheffield, 4th ed., 1999), especially pp. 26–27; *Green 2004*.
906
Crujera (2006); **Green 3** (Cedric; 1999); **Green 4** (Cedric; 2002).
907
Brunsdon (London 1965): 55–56; **Chamberlain** (London 1972): 76–82, quote on p. 77; **Edmonson** (New York 1973): 85–95; **Gross** (London 1970): 152–157; **Heller** (New York, 2nd ed., 1972): 252–255; **Jurkiewicz** (Warszawa 1975), information kindly supplied by the Muzeum Narodowe w Warszawie, Contemporary Graphic Art Department; **Peterdi** (New York, rev. ed., 1973): 248–252; **Ross & Romano** (New York 1972): 220–227; **Russ** (New York 1975): 122–124; **Saff & Sacilotto** (New York 1978): 171–178, quote on p. 171; **Werner** (Kraków 1972): 125–144. For the early stages of photomechanical etching in the nineteenth century see below under 'Photomechanical intaglio processes'.
908
Pettersson 2008.
909
Zoete 1988, discusses all technical details. 'Macdermid Autotype, the last manufacturer of the gelatin pigment paper (tissue) needed to make traditional copper plate photogravure, announced in August 2009 that the product would no longer be manufactured'; http://en.wikipedia.org/wiki/Photogravure (2010).
910
A Xerox copy holds more resin-containing toner than a laser print and is therefore more acid-resistant.
911
Process developed by Yuriko Miyoshi as a cheaper and safer alternative to dot screen photo-etching on copper plates in the mid-1980s. See also: **Brown 2** (2008); **Dohmen** (Köln 1986): 196–197. Alois Senefelder had developed a similar technique for copying typographic text onto a lithographic stone; *Senefelder 1818*: 35–36, 304.
912
Dusting the ink with asphaltum powder was common in the etching of line relief blocks (zincography); *Böck 1910*: 46–52; *Smith et al. 1951*: 171–175.
913
Hoover (1996).
914
Harrison (Rex; 1994); **Pengelly 2** (1994).
915
Longley & Muir 1996.
916
Ponsaing (Valby 1995); **Ponsaing** (1995).
917
Bradley (1996); **Bytautas 1** (2004); **Eskola & Holopainen** (Helsinki 1996); **Longley & Muir** (1996); **Longley** (Adelaide 1998); **Matkevich** (Balmain 1994); **Muir** (1999); **Neis** (2003); **Ponsaing** (1995); **Rosa 2** (2009); **Welden** & **Muir** (New York 2001). The plates are produced by BASF in Germany and Toray Industries Inc. in Japan.
918
Howard 1993; **Howard 1** (1993); **Howard 2** (1994).
919
Howard 3 (1994); **Howard 4** (1995).
920
Note that they did not use the term 'non-toxic' at that time – Betty Winkler was among the first to use the term in relation to intaglio printmaking; **Winkler** (New York 1995): 1. The term itself was already common in American printshops some years before, see for example: *The Print Collector's Newsletter*, 22 (1991) 2: 50, col. 3, l. 36 where it mentions a 'nontoxic studio'.
921
Brand names are ImageOn Ultra, Photec, Blue Shot. **Dove 2** (1996); **Harrison** (Rosalind; 1996); **Howard** (Grande Prairie 1998); **Zafron 1** (1995).
922
Bøegh (Copenhagen 2003): 46–60; **Howard** (Rochester 2003): 3–4, the author describes a wide range of techniques for polymer films he has developed; **Lehtinen** (Helsinki, 2nd ed., 1997): 174–175; **Rosa 1** (2002); **Zaffron 1** (1995).
923
For a history of photography, mainly in Germany, with short introductions on photomechanical processes and extensive bibliographies on publications with specimens and technical literature see: *Heidtmann 1984*. For a short overview see: *Verburg et al. 1989*. For developments in the Netherlands see: *Zoete 1991* and *1995* (various chapters). Johan de Zoete researched widely into nineteenth-century reproductive graphic techniques and introduced me to the subject. With thanks to Peter Miller for reviewing this paragraph.
924
Some studies: *Asser 2000*; *Jones 1990*: 49–50, 53–55. This is different from the debate on original and reproduction often provoked since the introduction of photomechanical printmaking techniques, see the Introduction, p. 6.
925
See: *Nadeau 1989–1990*. This encyclopaedia has over a thousand of these processes alphabetically arranged according to process, with several indices.
926
See Chapter 4, p. 335.
927

Fleischmann 1998: 12, 41–42, 48, fig. 20; *Von Rumohr 1837*: 104–105, pl. V, VI (specimens).
928
Nadeau 1989–1990: 436–437 (Stereotype); *Van der Linden 1979*: 88.
929
Franklin Journal 1826: 178; **Smee** (1840): 102; *Woodcroft 1969*: Suppl., pp. 314–315, English patent, A.D. 1835, May 13.–No. 6830, etc.
930
Bradbury was dissuaded from its use for larger and more complex banknotes because the process only worked well with 'very small subjects' and impressions 'must be retouched by the graver'; *Bradbury 1856*: 19–20.
931
Berthiaud (Paris 1837): 283–284; **Perkins 1** (1811): 263–264; **Perkins 2** (1820-1): 163–165; **Perkins 3** (1821): 48; **Perkins 4** (1821), the French translation of 1822: 123–125; *Ure 1853*, 2: 735.; *Woodcroft 1969*: 122–123, English patent, A.D. 1810, October 1.–No. 3385, see p. 123; *Woodcroft 1969*: 144–147, English patent, A.D. 1819, October 11.–No. 4400, see p. 147.
932
Cave 2010: 88–93; *Fischer 1933*: 188–190; *Harris 1968–1970*: 6: 67, 83–86; *Heilmann 1997*: 91–95, 97.
933
Cave 2010: 94–101; *Harris 1968–1970*: 6: 57–65; *Heidtmann 1984*: 553–554, followed by a bibliography of publications of, or with, nature prints, and a discussion of further developments; *Heilmann 1964*: 297; *1985*: 133–135.
934
The process should not be confused with a method of the same name, used since antiquity, in which the inked surface of an object is stamped or printed, usually in relief and sometimes in intaglio. A typical example is the taking of fingerprints by pressing inked fingertips onto paper.
935
Auer 1854: 25–45.
936
The volume illustrates all the kinds of materials reproduced by the k. und k. Hof- und Staatsdruckerei; *Heilmann 1997*: 95–98; *Nadeau 1989–1990*: 339–340 (Nature Printing); *Van Eijk 1856*, with specimens; *1857*, with specimen; *Zoete 1995*: 119–121.
937
Woodcroft 1969: Suppl., p. 342, English patent, A.D. 1853, May 11.–No. 1164, under the names of his father William Bradbury and his father's business partner Frederick Mullett Evans. See also above under 'Steelfacing'.
938
Auer 1854: 47-75; *Cave 2010*: 102–107; *Heilmann 1964*: 302; *1997*: 98; *Wakeman 1984*. Auer had patented the process under Worring's name on 12 October 1852 (patent no. Z.7698), but cancelled it again in 1853 as Austria was 'disinterested'. Bradbury exploited the cancellation and lawfully patented the process himself; *Harris 1968–1970*: 6: 57–59. A few years later Bradbury would also claim zincfacing copper plates, challenging Joubert's steelfacing patent of 1858, which also stimulated a debate; see above under 'Steelfacing'.
939
Cave 2010; 108–116. Several other patents on nature printing were granted in the years following; *Woodcroft 1969*: p. 419–421, 511–512, English patents, A.D. 1854, February 24.–No. 451 (Cyril Jeddere Fisher), A.D. 1854, March 4.–No. 529 (Felix Abate), A.D. 1854, March 8.–No. 556 (Guiseppe Devincenzi), and A.D. 1855, December 22.–No. 2904 (Christopher Dresser).
940
Fielding (London 1841): 95–100; *Harris 1968–1970*: 5: 66; *1968–1970*: 6: 65–67; **Smee** (1840). The electrotype process was found a most useful process that generated a range of publications on the topic immediately after its invention until the twentieth century; *Bridson & Wakeman 1984*: 29–33, 46, 55–56. For further patents based on Spencer's see: *Woodcroft 1969*: 222–224 (1840), 229 (1841), 231–233 (1842), *etc*. See also above under 'Electrolytic etching'.
941
Jacobi 1840: 51–52; **Smee** (1840): 102.
942
Jacobi 1840: 56–59; *Walker 1856*: 236–259.
943
Dyson 1984: 53; *Hunnisett 1980*: 191.
944
Joubert 2 (1858): 18; **Process** (1858). Electrotypes of steel engravings (!) were steelfaced; *Urguhart 1881*: 193–194. This seems odd because far more prints could be pulled from a steel plate, but is useful if more printers need to print the same image from different plates in tandem or in different workshops. Replicated plates were also for sale.
945
Steel and iron facing (1882); **Vogel** (1848).
946
Bradbury 2 (1860).
947
Walker 1856: 230–231.
948
Elsner & Knoblauch 1841; *Felsing 1841*; **Hollenberg** (Ravensburg 1962): 75–76; *Schaar 1988*; **Schall** (Leipzig 1863): 44–45.
949
English patent, A.D. 1841, 12 June.–No. 8987; *Harris 1968–1970*: 6: 67–68, 70; *Woodcroft 1969*: 229. The process was called 'electrotint' by T. Sampson; *Bridson & Wakeman 1984*: 32 no. A119. The processes of Kobell and Palmer should not be confused with the so-called 'spongotype', invented by Hubert von Herkomer. This concerns a design painted on a metal plate, which is steelfaced and the plate printed as such, ie not replicated. See above under 'Collagraph'. For a modern variety see: http://www.mixografia.com/whatismixografia.php (2010).

950
Hind 1963-1: 13, 211. For a summary overview with contemporaneous references see: *Harris 1968–1970*: 6: 71–89. See above under 'Mechanical Procedures – Tone' and 'Crayon' respectively.
951
Hunnisett 1980: 46.
952
Frieß 1993: 155–161.
953
Palmer (1826): 44.
954
Deleschamps (Paris 1836): 235–239, pl. 3; *Edlem von Keeß 1823*, 2: 30, refers to Austrian manufacturers of ruling machines; **Henrici** (Leipzig 1834): 49–52; **Longhi** (Hildburghausen 1837): 16, refers to German manufacturers of ruling machines; **Partington** (1826), 2 (2): 65–69 with specimen, 106–108 with fig.; **Perrot** (Paris 1830): 249–250; **Perrot** (Paris 1830): 249–250; Perrot's information on ruling machines was lacking, hence Thon added further details here; **Perrot** (Thon; Ilmenau 1831): 45–52; **Perrot** (Paris 1865): 311–324; **Villon** (Paris, 2nd ed., 1914) 1: 321–342.
955
Jacque (1852): 373–374.
956
Frieß 1993: 180–185; *Harris 1968–1970*: 4: 74–86.
957
Frieß 1993: 185–200.
958
Ackermann 1841: [1] offers 'diamonds for Ruling Machines' at 12 and at 21 shillings; **Fielding** (London 1841): 91–93.
959
Zoete 1991: 9; *1995*: 113–114. Patent received 13 January 1839; *Tijdschrift nijverheid 1832–1859*, 5 (1839): 575.
960
Various species of purpur snails are found along the coast of the Mediterranean as well as other coasts; *Kühn 1984*: 24–25; *Mayer 1991*: 59 (Tyrian purple).
961
Frizot 1998: 23, 27, 29.
962
For a concise introduction to the subject see: *Frizot 1998*: 8–31; *Heidtmann 1984*: 9–12. For definitions with selected literature see: *Nadeau 1989–1990*: 83–84 (Daguerreotype): 370 (Photogenic Drawing): 372 (Photography). The daguerreotype process was patented in England on 14 August 1839 under the name of Miles Berry, see: *Woodcroft 1969*: 210–212. A.D, 1839, August 14.–No. 8194.
963
J.W. Draper invented a process to replicate daguerreotypes, but such replicas apparently were meant as decoration and not as printing plates; *Nadeau 1989–1990*: 450 (Tithonotype or Tithnotype).
964
For an introduction to the first developments of photomechanical processes see: *Frizot 1998*: 224–231; *Heidtmann 1984*: 12, 14, 547, 551–552; *Tijdschrift nijverheid 1832–1859*, 8(4): 551–552. For definitions of the earliest processes see: *Nadeau 1989–1990*: 103 (Etched Daguerreotype): 104 (Etching Daguerreotype): 107–108 (Fizeau's Engraving Process) with names of inventors. For discussions of techniques see various issues of the *Polytechnisches Journal*.
965
Berres (1840); **Claudet** (1844); **Donné** (1840); **Fizeau** (1844); *Walker 1856*: 105–106. Berres could print an edition of 200 of his etched daguerreotypes; *Heidtmann 1984*: 552. Note that most daguerreotype plates were silverfaced copper plates.
966
One plate in the *Excursions Daguerriennes* is a reworked daguerreotype plate *gravé par le procédé Fizeau*; *Lerebours 1841–1844, Maison élevée rue St. Georges par M. Renaud*.
967
Piil (1855), with a specimen reproducing the engraving *The Prodigal Son* by Albrecht Dürer.
968
Heidtmann 1984: 697, 701. The technique was refined by Georg Scamonie under the name of 'heliography'; *Scamonie 1872*.
969
William Henry Fox Talbot, 'Photoglyphic engraving', English patents, A.D. 1852, October 29,– No. 565 and A.D. 1858, April 21.–No. 875; *Nadeau 1989–1990*: 370 (Photoglyphic Engraving of [W.]H.F. Talbot). *Heidtmann 1984*: 702–703; **Talbot** (1858); *White 1978*; not in *Woodcroft 1969*. For Talbot's use of ferric chloride in etching, see above under 'Mordant'.
970
Amand Durand 1878, 1926; *Gravures 1978*.
971
Such a process is described by: **Adeline** (Paris 1894): 159–161.
972
The use of fine-textured roulettes might be an indication Amand used copper plates, steel being too hard for this.
973
Typical also is his special printing paper, which at first glance looks like a thin oriental paper but is in fact a laid machine-made paper. All of Amand Durand's publications include his small red mark stamped in the middle of the back of the print.
974
Heidtmann 1984: 702.

975
Perrot (Paris 1865): 288–293.
976
Eder 1922 discusses every aspect of photogravure. *Heidtmann 1984*: 702–707, sketches the developments, mentions a variant to the process by J.B. Obernetter, and includes a bibliography of publications illustrated with photogravures in the first ten years after the invention of the process. *Nadeau 1989–1990*: 372–374 (Photogravure), with literature. 'Heliography' should not be confused with 'heliogravure' (= photogravure) – both are photomechanical processes but heliography is used for the reproduction of originals in line only while heliogravure is employed for the reproduction of halftones.
977
Denison (London 1895).
978
For a reconstruction of the historical process and adaptation to modern materials see: *Zoete 1988*. Photogravure was long used in Germany, France and England. In the Netherlands it was used relatively late and during a short period only, from 1890 to 1919; *Zoete 1991*: 24–25; *1995*: 55.
979
Heidtmann 1984: 722–729; *Lilien 1963*: 9–18, outlines the history of the company; *Nadeau 1989–1990*: 414–415 (Rembrandt Photogravure), pp. 418–419 (Rotogravure); *Zoete 1988*: 16–17.
980
Talbot had already experimented with the use of a screen of crossing lines instead of aquatint in 1852 but did not succeed in solving the technical difficulties; *White 1978–1979*.
981
The technique of bending the intaglio plate around and fastening it upon a cylinder for mechanised printing was already performed by machines invented by Guy and used by Bradbury and Wilkinson around 1880; **Intaglio printing machine** (1881); *Guy 1876*, his machine is suitable both for printing from flat plates and plates bent around cylinders; *Printing 1878*. See also Chapter 4, p. 309.
982
Lilien 1963: 115–123; *Lilien & Gerhardt 1978*: 66–85.
983
Heidtmann 1984: 728; *Krüger 1914*: 200–202; *Lilien 1963*: 48–56; *Nadeau 1989–1990*: 372 (Photogravure).
984
Etzel 1976; Heidtmann 1984: 725, 729; *Stiebner et al. 1978*: 163–187, 276; http://en.wikipedia.org/wiki/Rotogravure (2010); http://www.arbeitskreis-druckgeschichte.de (2010) – *Tagungen – Tagung 2006: Das Druckprinzip Tiefdruck, alte und neue Technik*.
985
Rhead (London 1890): VII.
986
Meusnier (Paris 1891): 68.
987
Villon (Paris, 2nd ed., 1914) 1: 199–287.
988
Ziegler (München, 2nd ed., 1912): 238–252.
989
Rops (Paris 1873–1894): 43 (transcription pp. 70–71). See above under 'Chemical Procedures – Crayon – Dissemination of information'.
990
Barral 1990: 87. For the recent revival of photogravure and the present popularity of photography in intaglio techniques see above under 'Photomechanical techniques' and 'Solarplate and photopolymer film'.
991
Nierhoff-Wielk et al. 2007: 230–232.
992
Heller (New York 1972): 1–3, fig. 1.
993
Ross & Romano (New York 1990): 276. For an introductory essay on the development of digital printmaking, history and concept, see: *Nierhoff-Wielk 2007*. For digital printmaking techniques see: **Newman 2** (New York 1977): 262–277; **Ross & Romano** (New York 1990): 269–278; *Whale & Barfield 2003*. For a complete overview of digital printing techniques see: *Jürgens 2009*. For the gradual acceptance of digital printmaking see: *Moser 2009*.
994
Whale & Barfield (London 2001): 68–71. In indirect form a photograph is taken from the screen and then further processed.
995
Smith (Edith; 1982).
996
Adam & Robertson (London 2007): 190; **Bøegh** (København 2003): 86–98; **Howard** (Rochester 2003): 137–164; **Smith** (Kate; 2003). See also above under 'Chemical Procedures – Modern developments'.
997
See above under 'Tracing'.
998
Mustalish & Ribuoli 2009: 155; **Ross & Romano** (New York 1990): 276; **Whale & Barfield** (London 2001): 76, 78. A parallel can be drawn with the use of a ruling machine, especially for anaglyptography, where the lines in the ground are drawn by means of the machine.

Printing the Matrix

> Finally we should express the wish that some more attention will be paid to plate printing. This art is seen by many intelligent persons as just a secondary activity, but it deserves to be perfected.
>
> *Christian Ludolph Reinhold*[1]

Printmaking consists of two separate procedures: the production of the plate and the printing of the plate. Although connected they are not related, each having their own separate antecedents. In addition, unlike the production of the matrix, the history of intaglio printing is not highlighted by series of inventions, many of which can be attributed to particular persons. The historic development of intaglio printing should be regarded as a more continuous, organic process.

The principles of the process of intaglio printing have not changed from its beginnings in the 1430s to the present day: the grooves of the plate are filled with an ink, its surface cleaned and the ink transferred from the grooves onto a support, usually paper. Before the eighteenth century intaglio printing was barely mentioned in practical manuals – prescriptions for ink or printing are rare and monographs on intaglio printing appear only after 1800. Bosse's chapter on printing has always been a respected source, despite the fact that he was not a printer (*pas de ma profession*) and he had no intentions of writing about it until urged by his friends.[2] But then he did more than just record plate printers' methods – he described and illustrated the construction of a roller press, gave detailed instructions for plate printing and discussed various colour printing methods.

Other manuals merely discuss etching and engraving the plate, the printing of the plates usually being taken for granted. Eighteenth- and nineteenth-century etching prescriptions often conclude by simply stating that the finished plate should be taken to the printer with no further details. It was not until the late eighteenth century that printing became recognised as a craft in its own right with its own artistic merits. A century later artist-etchers started printing their own plates having understood its creative potential – they had realised the important role that printing played in the creation of the image and that it was more than just the grooves of the plate that determined the appearance of the print. Differing opinions concerning the choice of leaving more or less plate tone (Ludovic-Napoléon Lepic, James Whistler), dragging some ink from the grooves after wiping (Auguste Delâtre) or wiping plates clean (Seymour Haden) enhanced the appearance of the new kinds of etching produced in the 1860s. Artist-etchers also began mixing in brown and red toners to give the black ink a warmer hue, instead of the blue toners commonly used by professional plate printers. In the 1890s French artist-printmakers developed a taste for working with colour with the result that colour printing flourished in Paris for decades afterwards.

Printing and its different effects rarely depart from the more obvious in art historical discussions. However, the relationship between the choice of paper, the particular pigment used for the ink and the wiping of the plate is more intricate. The balance between paper, ink, wiping, plate and press in relation to only the plate and its texture is not always obvious but change just one aspect and the others have to be adapted as a result. The optimal appearance of a print is always a compromise between what the engraver wishes to achieve, the available materials and equipment, and the skills of the printer. This applies also to modern artists who print their own work: printing is a struggle towards an imaginary goal and one just hopes for the best. For the student of the print this means that, as with engraving and etching techniques, the printing of the plate requires intimate knowledge of its materials and procedures, and their history, in order to better understand why a print appears the way it does.

General

Plates are printed on paper and paper, being a mat of stiff fibres, needs to be forced into the grooves to be brought into contact with the ink. This is in contrast to relief printing in which the ink sits on top of the matrix and where the slightest contact is enough to offset the ink from the matrix onto the support. In intaglio printing, considerable pressure needs to be exerted on a small surface area in order to achieve optimal results with the available equipment. In the first decades of the history of intaglio printmaking this was performed by rubbing a hard object with a rounded end over the back of the paper. Later, a machine, a roller press, came into use to concentrate all the force along the bottom line of the top roller underneath which the plate passes.

Because of the amount of pressure needed, press manufacturers focused on limiting the friction within the bearings of the machine in order to guarantee smooth printing to produce a proper image, both for aesthetic and economic reasons. Very few improvements were made to the performance of the wooden roller press over a period of four centuries. However, a big step forward was taken with the introduction of the full-metal press in the early nineteenth century.

Intaglio colour printing followed its own capricious course. The basic technique is the same as printing in black only but with the additional need to take account of the colour and the ways various colours are combined to create one image. Monochrome (single colour) impressions had already appeared in the fifteenth century and different methods for polychrome printing were tried throughout the sixteenth, seventeenth and early eighteenth century until a practical system of three-colour printing in blue, yellow and red (in that order) was understood by Jacque Christoph Le Blon in the 1710s, after which true printing in colours developed, heralding the modern era of colour printing.

After the separation of the disciplines of plate making and plate printing in the course of the sixteenth century, they followed separate paths for more than two centuries. It was the artist-etcher of the second half of the nineteenth century who began printing his own plates again. The outcome of this was that discussions on the originality of prints in the twentieth century were concerned with how much the printmaker was involved in the production of the print and in particular whether or not he had printed his own plate.

Printing Support

It was only with the expansion of paper production that paper became more widely available and intaglio printing could begin in earnest.[3] The printing of woodblocks on textile was already well established for the decoration of cloths and wall hangings. Paper was used as support for prints about two centuries later, the idea being that single sheet images could be printed and produced in editions for marketing. The printing of copper plates shared this function and after the first phase of printing on paper was launched, parchment was also tried. Printing engravings on textile is documented from the second half of the sixteenth century.

Strictly speaking, paper manufacturers are not involved in the printing process therefore they will not be discussed here. In the past neither engravers nor plate printers have ever produced their own printing paper. Some modern printmakers make their own paper but this practice only appeared from around 1970.[4]

Paper

Paper is made of fibres composed of fibrils, which are polymers of cellulose molecules.[5] Fibre material is taken from a range of plants, shrubs and trees as well as from textile made of these fibres. Linen was the preferred material for papermaking in Europe up to 1800. It was gradually superseded by cotton in the nineteenth century and mixtures of various vegetable fibres are used for intaglio printing papers nowadays.

Papermaking starts by reducing pieces of textile or vegetable material to a 'pulp', a mixture of water and fibres; various bacterial, chemical and mechanical methods are used to reduce dry materials to fibres.[6] A mould with a sieve or cover of thin metal wires is dipped in a vat filled with pulp strongly diluted with water. The mould is lifted, water drains off through the sieve and a layer of fibres is left on the surface of the sieve. This layer is couched between sheets of felt, pressed to remove excess water, dried and possibly sized until a sheet of paper is created. All paper has either a 'laid' or a 'wove' texture, which is a cast of the sieve used in making the sheet. A laid paper shows 'chain lines' set at regular distances with 'laid' lines positioned next to each other at straight angles. Wove paper shows a finely woven, textile-like structure.

A sheet of paper is somewhat like felt – in a dry state it is stiff, inflexible and difficult to fold unless creased by force. Paper is carefully dampened to absorb water. Its fibres swell and the fibrils extend in the process because water mole-

cules attach to the cellulose molecules of the paper.[7] The paper becomes more voluminous, more pliable and its surface becomes denser; intaglio printing benefits from all three characteristics. Dampening allows the paper to be moulded into the relief of the intaglio plate during printing, filling all crevices and picking up the largest possible amount of ink.

Paper was not produced specifically for plate printing before the second half of the eighteenth century – producers generally distinguished between printing, writing and wrapping paper. These differences were due to the qualities of raw materials: the finest linen rags were used for the best qualities of writing paper and the coarsest materials such as ropes, nets and sacks for wrapping paper. Writing paper must be sized to avoid bleeding of the aqueous writing ink into the paper whereas printing paper is not, or only moderately, sized. The plate printer chose the most appropriate paper for the job in hand from the range available. A broad range of papers may therefore be encountered when studying older prints. It was only in the last quarter of the eighteenth century that papermakers were able to manufacture paper for particular purposes such as for the printing of etchings and engravings.

Paper quality

There is nothing to indicate which paper was preferred for intaglio printing before 1600 apart from studying the papers used for the actual prints; it seems that any kind of available paper was utilised.[8] It would be another two centuries before the first contemporaneous references to intaglio printing paper are found in Bosse's treatise.[9]

Historical authors limit themselves mainly to mentioning the provenance of certain types of paper suitable for the printing of etchings and engravings, without describing their properties. Apparently provenance equates to a certain quality and French paper in particular was popular in central and western Europe from the seventeenth century onwards.[10] Italian paper would do equally well, if not better, but the long trade routes meant that this paper was sometimes too expensive to be used in large quantities for general purposes north of the Alps. Italian paper mills produced enough paper – of better quality than most northern kinds of paper – to supply their own market. In workshop practice Italian, and often Spanish, printers used Italian paper.[11]

The qualities of the paper needed by the intaglio printer are described from the second half of the eighteenth century, when new etching and engraving techniques came into use and older ones were refined.[12] Specifications are given for paper suitable for printing mezzotints and aquatints, and later for the finely etched and engraved printing plates for banknotes and shares. The earliest reference is in Gauthier de Montdorge's article in Diderot's *Encyclopédie* (1757).[13] A general predilection becomes apparent for paper that is strong, white and lightly sized, with a fine structure and a smooth surface. According to Krünitz, rags for intaglio paper should rot first (something papermakers in the Auvergne did but not the Dutch) as this gives better rendering of the lines and tones of the print,[14] which is why Krünitz considered Auvergne to be the best production centre for intaglio paper. In Holland paper production centred on writing paper, which was exported; intaglio paper was imported.[15]

This is the period of technical developments in papermaking. The French produced good quality paper and exported to central, western and northern Europe. They processed rags in hammer works, which produced homogeneous pulp and consequently smooth paper with fewer knots. The so-called Hollander beater was invented in the northern Netherlands in the seventeenth century. It reduced textile to fibres faster than hammering by tearing larger pieces apart, but also left more 'knots' in the pulp.[16] For this reason the Hollander beater was only introduced in France in the 1780s.

Wove paper was made in England from 1754 onward by James Whatman the Elder, originally intended not for intaglio printing but for book printing.[17] Within just 20 years it was discovered that the new wove paper was also well suited to intaglio printing,[18] and even good enough to compete with foreign paper. Up to that time French paper had been preferred to local products, but due to the quality of their wove paper and also to further technical advancements English papermakers acquired a growing share of the Continental market.[19] This grew to such an extent that France even started to import English paper in the nineteenth century.[20] Benjamin Franklin had introduced wove paper in France in 1777 and explained how it was made. French paper manufacturers reacted quickly, setting up their own production lines for wove paper.[21] Papermakers in other European countries and in the United States followed from the 1790s.[22]

Wove paper was still considered a general all-purpose kind of paper that could be used for various printing techniques. Intaglio paper made specifically for the purpose was manufactured in England from 1786 onwards.[23] In September 1787, the English papermaker Samuel Hooper patented his procedure for adding 'fillers' to the pulp, a huge step forward.[24] Fillers, such as alabaster, gypsum, kaolin and others, are so named because they fill spaces in between fibres making the paper more compact and opaque.[25] Adding fillers allows the paper to pick up more ink from the grooves and even the finest lines print well, while at the same time the more opaque paper gives a higher contrast between the white of the paper and the black of the ink. Smooth wove paper with fillers added proved the ideal support for nineteenth-century steel engravings with their fine lines.

Paper formats

To return to an earlier period, from the fifteenth century onwards common paper formats measured about 28 × 33,

31 × 42 and 35.5 × 48 cm.[26] Larger fifteenth- and sixteenth-century formats measured approximately 42 × 55 and 45 × 60 cm.[27] Much larger paper formats only seem to have been available custom made;[28] more commonly two sheets of paper were pasted together to form one large sheet for prints from bigger plates.[29] A range of paper formats was available in the seventeenth century.[30] Table 4 gives comparative sizes (in cm) of regular paper formats in Holland

Table 4				
Name	*Plano*	*Folio*	*Quarto*	*Octavo*
Imperiaal	55 × 72			
Royaal	48 × 58			
Mediaan	42 × 54	27 × 42		

in the seventeenth century.[31]

We are best informed about paper formats in eighteenth-century France because of the *Arrêt du conseil du Roi* of 18 September 1741 that lists 57 'standard' formats.[32] Medium and larger sizes, from 55 × 80 cm (*Soleil*) to 67 × 100 cm (*Grand-Aigle*) were used especially for intaglio printing.[33] Moulds in special formats were made on request but it was noted that the production of paper of an unusual format could cause considerable losses initially until the workmen became familiar with the new size.[34] The *Arrêt* is also the first source to inform about the weight of paper giving the average and the minimal weight per 'ream' in *livre*, the larger paper being thicker. This is comparable to modern paper weights of between 80 and 200 grs/m^2.[35]

As mentioned in Chapter 3, engraver James Basire was commissioned by the Society of Antiquaries to reproduce the painting showing the meeting of Henry VIII of England and François I of France in 1532 (*The Field of the Cloth of Gold*). His plate of 27 × 49¼ in. (67.5 × 122.5 cm) was too large for any existing paper format; at that time the largest format of French paper available was 90 × 120 cm[36] and in Holland 70 × 122 cm[37] – both a little too short to print the plate. Still larger sheets had been manufactured for the even bigger (82 × 121.5 cm) etching plates produced by Johann-Daniel Herz the Elder in the second quarter of the eighteenth century, the paper measuring 88 × 130.5 cm.[38] But these sheets may have been custom made and not readily available on the market when Basire worked on his plate in 1772. The Society therefore ordered James Whatman the Younger, known to them because of the new kind of wove paper he and his father produced, to manufacture extra large wove paper especially for the plate, of a format of 31 × 53 in. (79 x 135 cm), since then named 'Antiquarian'.[39]

Developments continued with the mechanisation of paper production by Nicholas-Louis Robert who first patented the process on 9 September 1798. The plans met with acclaim, Robert developed the machine further and took out a second patent on 18 January 1799.[40] Information on the machine and the patent became known in England where the brothers Henry and Sealy Fourdrinier constructed and patented their own version.[41] A papermaking machine can, at a fixed width, produce an endless roll of (wove) paper thus exceeding any format, but at the time this was not so much of an issue – more importantly, the rate of production could be increased significantly. The quality of machine-made intaglio printing paper, however, was not considered to be adequate in the first decades of the nineteenth century.[42]

Until fairly recently it had been thought that printers cut the sheets to be printed to accord with the size of the plates in order to save on the costs of paper. Prints with wide margins have been, and still are, considered to be special and are advertised as such by print dealers. Surviving uncut prints, historical parcels of prints, stocklists of print dealers and historic interiors of printshops demonstrate that plates were almost always printed on full, half or quarter sheets, however.[43] The smaller paper formats would not have been used for intaglio printing because of their awkward and time-consuming handling – working on larger sheets, such as the common paper format mentioned at the beginning of this section, is far more efficient. Bound print series from the sixteenth and seventeenth centuries show that two or more plates were printed on the left and right half of a full or half sheet.[44] Cutting prints at or close to their plate edges was carried out by dealers and collectors to fit in the albums in which they were commonly kept.[45]

Coloured paper
White paper washed with a surface colour can already be seen in some later fifteenth-century engravings.[46] Girolamo Mazzola (Parmigianino) and Andrea Meldolla (Schiavone) continued this practice in the second quarter of the sixteenth century.[47] Colouring the paper's surface before printing is found throughout the centuries, for example, in some of Hercules Segers's experimental prints as well as more official publications.[48]

More commonly we find papers mass coloured by the papermaker, ie the papers are completely coloured. Engravings and etchings are found printed on blue paper from the second quarter of the sixteenth century onwards (Fig. 207). The earliest Italian examples printed on coloured paper date from 1527–1531 when Monogrammist F.P., working after Francesco Parmigianino, printed some etchings on blue paper.[49]

The use of blue paper continued – the earlier impressions were usually printed with black ink and heightened in white by brush, but in the eighteenth century etchings and crayon engravings printed from two plates in black and white ink on blue paper appear.[50] Other paper colours can be found too such as the *chiaroscuro* etchings by François Perrier printed from two plates with black and white ink on grey or brown paper (see Fig. 289).[51] Yellow and pale green papers are seen with eighteenth- and nineteenth-century prints (Fig. 208).[52] There are a number of reasons for the decision to print on coloured paper such as commercial (a more attractive appearance helping to aid sales), presentation purposes for a particular occasion, specifically for a collector or as an experiment.

Oriental paper

European engravings and etchings were printed solely on European paper until the second half of the eighteenth century, when the regular import of Chinese paper commenced. Seemingly, on only one earlier occasion, a batch of (blank) oriental paper found its way to a Western printshop – Rembrandt and artists in his circle had some Japanese *gampi* paper at their disposal in the later 1640s and the 1650s.[53] Rembrandt used this paper with its particular appearance to print his larger plates (Fig. 209). Biörklund gives two references of 1643 and 1644 respectively for the supply of paper by the Japanese to the Vereenigde Oostindische Compagnie (VOC, the Dutch East India Company),[54] but his evidence is a bit thin. First, the oriental papers used by Rembrandt were of different qualities,[55] suggesting that either he acquired a mixed batch at one time or several small amounts at different times. Secondly, Dutch merchants had been buying oriental and especially Japanese papers from 1607 onwards for administrative purposes and letters written on these papers had arrived in the Netherlands regularly since then.[56]

Apart from the quantities needed for official use, there were ample opportunities for further paper trade, either official or private, throughout the seventeenth century. Oriental paper was known in the West: books and paintings, printed and drawn on paper, decorated as well as blank sheets are recorded in Europe on a number of occasions from the beginning of the seventeenth century.[57] Jean-Baptiste Du Halde (1736) was the first to give a scholarly description of papermaking in China.[58]

From 1750 Chinese paper was imported into Europe regularly,[59] initially for intaglio printing of maps in England but spreading further from then on.[60] Occasional references to seventeenth-century plates – apart from Rembrandt's – printed on oriental paper probably concern restrikes from the later eighteenth century (if not later) when Chinese paper became widely available on the European market.[61]

The thin oriental papers are especially suited to the so-called *chine collé* method of printing – a nineteenth-century printing process whereby the plate was covered with a sheet of thin oriental paper, a thicker European paper placed on top of it and the whole run through the press.[62]

Jean-Baptiste le Prince, the inventor (1768) of dust-grain aquatint, suggested that if paper manufacturers could imitate Chinese paper, then they would surely profit from it.[63] And papermakers did indeed take up this suggestion although it took a while – imitation Chinese paper was first manufactured in Europe after 1817.[64] Japanese paper was exported on a regular basis to Europe only after the opening up of the country to the West in 1854 but it was soon appreciated by Western printmakers, replacing the position of Chinese paper.[65]

Change of fibre

White paper was made by selecting the whitest rags and by exposure of wetted sheets to frost which caused the damp fibres to burst, thereby extending the total surface of the material and changing the refraction of the paper, making it look whiter. Although this weakened the fibres, during printing the paper picked up more ink.[66] Another ploy was the addition of a little blue colorant to the pulp which also made the paper look whiter and enhanced the contrast between the paper and the ink.[67] A new element in the mass production of paper was bleaching by means of chlorine by the late eighteenth century,[68] something not appreciated by printers when they discovered that it facilitated paper degradation.[69]

Up to this period linen was the preferred source of fibre for the better quality papers. Due to the increasing need for paper, demand outstripped the supply of hand-produced paper and there were simply not enough linen rags available. At the same time, the production of cheap cotton cloth increased significantly and as a result paper began to be made by mixing linen with cotton rags.[70] The advantage for intaglio printing was that the shorter cotton fibres moulded more easily to the relief of the plate, picking up more ink than the longer and stiffer linen fibres, but the disadvantage was that the paper made with this new kind of fibre was not considered strong enough.[71]

The search continued for finer papers and papers with a smoother surface, which could print even the finest grooves of etchings and engravings. After 1850 the requirements for particular kinds of papers diverge. Photomechanical etching techniques had been invented, their fine aquatint structures necessitating the finest, whitest and smoothest kinds of paper, ie machine made.[72] Artist-etchers, on the other hand, were being driven more towards manual etching techniques.

Looking for the kind of handmade papers used by their historical protagonists, they scoured the market for laid, cream-coloured seventeenth- and eighteenth-century papers or contemporaneous papers of similar appearance.

James Whistler was one of the first to demonstrate a clear interest in old paper for printing his etchings, removing blank pages from old books or buying it by the ream.[73] Paton (1894) observed that 'old paper, kind for kind, is better than new, because the decay of the size used in manufacture, which causes the faded tone so much valued, also tends to reduce the hardness'.[74] Old blank papers had already become rare by the 1890s, and artists and printers therefore turned to the new handmade papers. Some manuals on intaglio printmaking of around 1900 are printed on these papers and it must be said that the quality of the paper is near perfect, although it looks whiter and feels crisper than seventeenth- or eighteenth-century paper.[75]

The paper industry expanded enormously in the twentieth century due to mechanisation, increased scale and the better understanding of paper chemistry, and the manufacture of paper for manual intaglio printing became a niche market. However, due to the growing interest of printmakers and above all the increasing numbers of amateur printmakers since the 1960s, modern suppliers of artists' materials now offer a range of intaglio printing papers.

The basic technique of intaglio printing has not changed and the requirements for a more voluminous and pliable paper are still the same, but the present variety in fibre materials, formats, weights and colours is larger than ever before. Linen is rarely used now for Western-type papers; the bulk fibre material is cotton. Other kinds of fibres include hemp, jute and esparto grass with pure cellulose made from wood pulp added. Common paper formats are 50 × 65 cm, 56 × 76 cm and 70 × 100 cm; larger formats are supplied in rolls of 10 metres. Weights vary from 80 to 600 g/m^2. Apart from the various hues of white, standard colours of intaglio printing paper include cream, pale grey, pale pink and pale blue;[76] for the rest any shades of coloured drawing or watercolour papers are used.

This extended range of paper qualities offers possibilities for the experimental printmaker. Whereas the earlier printer had to paste several sheets of paper together in order to print very large formats, virtually any size of plate can be printed nowadays provided the bed of the press is large enough. The heavier papers are excellent for printing plates with strong reliefs, especially collagraphs. The papers with slight hues imitate historic papers.

Other supports

A variety of other supports has been tried for intaglio printing, some of which work well provided the material is supplied in thin flat sheets and is sufficiently flexible. Alternative methods have been developed for offsetting prints on non-flexible materials and for making casts of intaglio plates.[77]

Parchment and leather
Soon after the introduction of intaglio printing on paper other supports were tried.[78] Parchment, the oldest available writing material, proved suitable for printing engravings when sufficiently thin and carefully dampened. It has some disadvantages, however, compared to paper: it is more expensive and less pliable, it buckles when not stretched during drying and once flat it will warp again when exposed to moisture. Prints on parchment can be found through the centuries, prints by Rembrandt on parchment being an example, but its use is largely limited to portraits, *devotionalia* or commemorative prints (Fig. 210). The other skin product, leather (tawed or tanned), is occasionally mentioned as a support.[79]

Textile
Engravings printed on textile are documented in Italy where, on 22 April 1574, a contract was drawn up for 'one hundred impressions on paper and one hundred on textile', to be produced by father and son Valegio in Venice.[80] Textile-printed engravings became a commodity in England, France, Germany and Holland in the seventeenth century.[81] The kinds of textile found differ – linen, silk, velvet or cotton – but providing it is woven finely enough anything can be used as a printing support. Impressions on fabric do not register the image in the plate as well as paper, though, because of its structure. Linen and cotton fibres contain cellulose and can therefore be dampened to make them expand but they are still too coarse to pick up enough ink from the plate. Silk is made by silkworms (*Bombyx mori*) – its thread does not contain cellulose and does not expand when dampened with water. The material can be printed and will register the fine lines of an engraving or etching when woven sufficiently densely.

The function of printing on textile is rarely documented in historical references.[82] It is possible that engravings and etchings were printed on textile for specific reasons: as gifts for patrons, to commemorate special events, for portraits of famous persons and perhaps as souvenirs for tourists.[83] A typical genre is the French textile-printed university thesis issued from the seventeenth to the nineteenth century.[84] Impressions on textile, such as handkerchiefs, can be folded often,[85] which is why maps were printed on textile – unlike maps printed on paper that tore easily, they withstood constant folding and unfolding for use.[86] Impressions on silk were probably appreciated for their colourful and shiny appearance, a yellow silk cloth having a golden appearance (Fig. 211). Posthumous impressions on silk of plates by such famous artists as Dürer and Rembrandt appear to be forms of veneration.[87]

Hercules Segers printed some of his etchings on textile – both cotton and linen – apparently as experiments aimed

at reproducing or imitating oil paintings.[88] Printing woodcuts on textile was a cheap and easy substitute for weaving or embroidery. Intaglio printing on textile is also easy – all it needs is a dampened finely woven cloth. Why, then, did it take so long for plate printers to start competing with textile manufacturers? And, furthermore, why did it take so long for engraving to compete with painting? The image printed on textile can be coloured by brush in order to produce 'paintings' in editions and there would surely have been a market for such works. Others besides Segers must have come to the same conclusion but where are the examples?

Printed textile can be used to make clothes while single pieces can be embroidered and stitched to clothes.[89] Intaglio printing with oil-based inks on textile for decoration, such as for caps, clothes, fire screens and wall coverings, probably developed as a more refined manner of textile printing.[90] It formed a craft in its own right with examples dating back to the seventeenth century, such as Magdalena de Passe's printed wall hangings, and the sleeping caps for which she received three privileges from the Staten Generaal in 1630 and 1631.[91]

A typical case is the so-called *toiles de jouy*, French intaglio printed textiles from the period 1760–1843.[92] The printing and colouring was performed with mordants and dyes respectively replacing the oil-based printing inks used for printing on paper. This quality material was used for expensive clothes and wall hangings.[93]

Modern prints on textile are rarely found although the technique is not difficult.[94] Finely woven fabric is dampened in a pile of already damp sheets. The plate is inked and wiped as normal, placed on the bed of the press and covered with the cloth that in its turn is covered with a sheet of damp printing paper. This sheet gives extra volume in the printing and catches the ink that is pressed through the woven structure of the textile, to avoid the ink staining the felt blankets. To print on silk using the *chine collé* method, the silk is first bonded to backing paper and then the plate is printed onto the silk.[95]

Latex and paper clay

Modern supports are generally sheets of latex or natural rubber, and paper clay; the latter is a mixture of paper pulp and clay. The latex can be printed with ordinary intaglio inks on a roller press, the flexible material plying easily in printing.[96] For paper clay, normal inks are not appropriate as the ink mixture has to withstand the heat of a kiln. For this purpose an oil varnish is ground with a ceramic underglaze colour; some metal-containing pigments such as manganese black also work well. The plate is inked and wiped as normal, and printed on a sheet of leather-hard paper clay. The sheet is fired in a kiln until it becomes hard and shows the impression.[97]

Wood

Plates can also be printed on slices of thin wood veneer.[98] A typical alternative for printing paper used in Germany around 1700 was whitish birch bark.[99] Printing on thin plates of compressed cork is also possible but in all cases such materials are seen as ephemeral and thus rarely kept in collections.

Non-flexible surfaces

Besides printing a plate on a pliable support, offsetting engravings and etchings onto inflexible surfaces can be performed in three different ways, the easiest being to directly offset from the fresh print.[100] The impression is placed face down onto a hard surface and the back of the print rubbed until the ink has offset. With older prints, the ink of which is completely dry, the image is covered with soapsuds.[101] The lye in the soap saponifies the oil varnish of the ink, making it soft. The print is placed face down onto a plank, its back is rubbed and the lines offset onto the surface.

Most often encountered are prints behind glass and dozens of recipes for the technique can be found from the seventeenth century onwards.[102] In its simplest form, the glass plate is covered with a sticky layer, such as a mixture of a resin in turpentine. The print is dampened and stuck with its design to the layer. Next the damp paper is carefully rubbed off, leaving the printing ink. The glass can be decorated further with gold leaf, silver leaf and oil colours.[103]

Printing on ceramics using transfers was practised from the eighteenth century onwards.[104] The engraving or etching is inked with an underglaze colour mixed with oil varnish and printed onto 'transfer paper', thin paper coated with a water-soluble layer. The transfer paper is placed against the object and moistened until the paper loosens, leaving the design on the ceramic that is then fired to fix the ink.[104]

Printing Medium

Paper manufacture is a separate industry as is the manufacture of ink, the printing medium.[105] Both materials demand specialisation in their production and the earliest reference to a specialist maker of intaglio ink dates back to the sixteenth century.[106] A good quality ink of a dense black or a strong colour is the foremost requirement. It gives the highest contrast to the print that otherwise would look dull, grey or flat, ie the complete opposite of the desired ef-

fect. In the event that a longer print run is needed, it is the shape and size of the individual pigment particles that determine the wear of the plate and thereby the number of editions that can be pulled.

Knowledge of how to prepare quality ink was not universal and observation of prints shows clear differences in the appearance and behaviour of inks from different places and periods. An enhanced understanding of ink, its constituents, production method and its application in printing therefore gives a better insight into its effects during the printing process.[107]

Rendering a text or image on a blank sheet of paper is possible due to the contrast between the ink and the surface upon which it is printed. It is possible to print on supports other than paper, but not without ink – in other words 'no ink no prints'.[108]

Constituents

A standard oil-based printing ink – regardless of the graphic technique for which it is being used – consists of a vehicle, also called a 'varnish', and a colorant; other ingredients may be added. The constituents are mixed and then ground together. Varnish is vegetable oil, usually linseed oil, heated at a specific temperature and for a certain length of time to make it more viscous. The essential properties of the printing ink itself are determined by the mixture of varnishes with dry pigments in certain ratios. Other constituents added in the preparation of the varnish or the ink modify the ink's properties to make it suitable for specific printing performance.[109]

Intaglio ink has its own properties. Its viscosity is lower than that of typographic or lithographic printing ink because it has to be rubbed into the crevices of the plate and wiped again from its surface. The ink should be opaque and should dry, but not too fast. Inking and wiping should proceed fairly easily, and the ink should readily offset from the grooves of the plate onto the paper. It should not dry on the surface of the plate, the pigment particles should not scratch the surface, and the ink should not smear or leave streaks in wiping. The ink should dry completely to a flexible layer, which does not powder, offset or bleed causing haloes to form in and around the imagery.

Before continuing, I would like to briefly mention etymology. The English word 'ink' (*inkt* in Dutch, *encre* in French) can refer to the oily material used in printing as well as to the aqueous material used for writing: they are homonyms. In the context of this study the term 'ink' is used for the paste-like, oil-based printing medium and not for writing ink.

Oils

The binder of an oil-based ink is a drying vegetable oil in most cases; only sometimes is the oil of animal or mineral origin. The viscosity of such vegetable oils increases by heating and they form solid elastic films by absorption of oxygen and further polymerisation. Drying properties are determined by the percentage of triglycerides of certain unsaturated fatty acids.[110] Non-drying oils, such as olive oil, hardly absorb oxygen. Olive oil thickens after being heated at high temperatures, but does not dry in air, however long exposed. It is not suitable for printing inks – because it remains liquid it would bleed into the paper and cause brown haloes to form around the ink lines. Instead of olive oil nowadays mineral oil is used as a lubricant in metal screws and bearings, such as for printing presses and honing stones.[111] Adulteration of linseed oil with cheaper, slower drying oils such as hemp-seed oil eventually retards the drying of the printing ink, which can cause bleeding and staining.[112]

Vegetable oils

The oil most commonly used for all printing techniques is linseed oil. It is mentioned from the earliest recipes for intaglio ink onwards.[113] Linseed oil is pressed from the seeds of the flax plant (*Linum usitatissimum*) and is widely available.[114] Its main constituent is linolenic acid, which has three isolated double bonds, together with linoleic acid, which has two isolated double bonds.[115] These polyunsaturated fatty acids ensure the drying of the oil to form a plastic solid. There are local differences in the qualities of the linseed oil, depending on the plant and its seed. Historically, linseed oil from Flanders and the northwest of France was in common use, while linseed oil from the Baltic area was preferred. The more modern oils from North and South America are not only considered to be of a lesser quality but also unsuitable for making printing ink varnishes.[116]

Old, but not rancid, linseed oil is generally appreciated but in the past authors gave no further explanation.[117] The available knowledge is empirical and any scientific reasoning is absent, or not comparable with present standards. Not until around 1900 was it understood that when the oil is allowed to stand for a few years, water and water-containing components separate out from the oil, unsaturated fatty acids start combining and the oil begins to slowly absorb oxygen. This propels further oxidation of the oil when it is exposed to air on a larger scale, with a subsequent decrease in boiling time when compared to fresh oil.[118]

This, however, ensures an ink with good drying properties and with less likelihood of bleeding and staining. Allowing the oil to stand for some years is time-consuming but with an expanding economy and the subsequent growth of printed publications, there was a surge in the demand for varnish. To meet this demand, faster ways were sought to

obtain a suitable oil and from the eighteenth century linseed oil was refined in various ways to prepare it for processing.[119] By the early twentieth century, the oil was stored in large tanks and heated for some time to allow the impurities to settle at the bottom of the tank.[120] The seeds are lightly heated before pressing to increase the yield of oil and from the nineteenth century the oil was usually extracted by means of solvents or sulphuric acid. Heating the seed at higher temperatures creates more impurities in the oil and starts the polymerisation process. This is not wanted for pale-coloured transparent varnishes, for example for oil paint or coloured inks, for which cold-pressed and solvent-extracted oils are preferred.[121]

Walnut oil, pressed from the edible part of the fruit of the walnut tree (*Juglans regia* from the Juglandaceae family), is occasionally mentioned in historic, especially French, sources on intaglio inks.[122] Like linseed oil it has good drying properties, although it dries more slowly because it contains more saturated fatty acids. It has to be boiled longer, but contains less linolenic acid, which determines the amount of bleeding of the varnish into the paper after printing and limits discoloration of the print due to the browning of the haloes. High quality walnut oil is almost colourless and suitable for the lightest colours.[123] John Evelyn translated Bosse's treatise and presented the part on printing in a lecture to the Royal Society in 1662. He added an idea of his own to prevent inks made with light-coloured pigments from discolouring – he proposed the use of poppy oil that had just become popular with painters.[124] The use of poppy oil for intaglio ink was discussed again later.[125]

Vegetable oils, such as cottonseed oil, castor oil, and Chinese or Japanese wood oil (tung oil) appeared on the market in the course of the nineteenth century.[126] Mineral oil gradually came into use as a medium for printing inks in the twentieth century. It does not oxidise, so does not dry in this sense. With inks based on mineral oil, the liquid part sinks into the paper and volatile organic compounds evaporate, leaving a layer of resin and pigment on top of the paper.[127] A variety of other vegetable and animal oils was also utilised in the production of varnish in the twentieth century, but linseed oil remained the primary source for oil varnish in general and in particular for varnish for intaglio ink.[128]

The use of soy oil in printing inks has seen a strong growth in the past two decades, especially in the United States.[129] A semi-drying oil, it is used as a replacement for mineral oil as well as linseed oil. Inks made with soy oil dry by the oil sinking into the paper, as does mineral oil. It takes a few months before a thin layer of soy oil oxidises and becomes dry to the touch, which makes it unsuitable for intaglio inks with voluminous ink layers, causing offsetting and staining. Ink made from soy oil has been used for printing the shallow structures of polymer films and solarplates since the beginning of this century (see below).

Oil varnish

A drying vegetable oil cannot be used for ink making in its raw state as it is too slow drying. The oil will leach away from the ink layer into the paper, brown haloes will appear in the paper around the ink and on the verso side of the sheet. There will not be enough binding medium in the top of the ink layer thereby exposing the pigment particles and causing their release or 'powdering'. Mould and yeast may grow on the ink, and the oil will stain.[130] In order to make the oil usable it has to be heated – heating starts the drying process and the oil turns to a viscous liquid after cooling, the 'oil varnish'. The following information on the preparation of oil varnish is for a large part drawn from sources on preparing oil varnish for letterpress printing mainly because there are more sources available and the boiling processes of the two are virtually the same. The differences are found in the final products, which are determined by boiling time and the addition of further constituents.

Boiling and burning

Boiled oil varnish is described before 1400 for use as a medium for oil paint and for coating painted surfaces. Prescriptions for making oil varnishes for relief printing ink for textile printing appear throughout the fifteenth century.[131] From then on their recipes were refined for printing techniques, but the preparation methods of the oil varnishes basically remained the same, the only variations being the different viscosities needed and the constituents added in the boiling of the varnish. Clearly knowledge was available concerning the preparation of the binding media and only required some adaptation to make them fit the requirements of intaglio printing. The first intaglio ink recipes date from the first quarter of the sixteenth century,[132] and Bosse gives the first detailed account of preparing oil varnish for intaglio ink in 1645.[133]

Historically, the oil varnish was prepared by heating linseed oil and allowing it to boil for periods ranging from a few minutes to several hours.[134] In the process unsaturated fatty acids oxidise and polymerise, combining into longer chains of molecules.[135] The boiling time determines the viscosity and the drying speed of the final product. A briefly boiled varnish that is less syrupy gives an easier flowing ink, whereas ink made with a varnish with a higher viscosity dries faster. In wiping the plate, ink made with the thinner varnish wipes off more easily, while ink made with the thicker varnish sticks to the plate. A thinner varnish will sink more deeply into the paper, exposing pigment particles on top of the ink layer and giving the dried ink a matt appearance. Ink made with a thicker varnish will remain on the surface of the paper and the dried ink will have more gloss. Ink makers therefore mixed varnishes of two or some-

times three different viscosities, combining their properties into a consistency suitable for the particular job in hand.[136]

Copper kettles and iron cauldrons of various shapes and sizes were used. A tall and slender pear-shaped copper kettle with a narrow neck and a tightly fitting lid was made especially for the purpose. Two round handles protruded above the lid allowing the kettle to be lifted by two men using a wooden stick threaded through them (Fig. 212).[137] A quite different shape is the wide-mouthed iron cauldron (Fig. 213).[138]

The kettle or cauldron is filled with oil up to half to two-thirds of its capacity and placed over an open fire (Fig. 214) – the level of oil must not be any higher otherwise it will spill over and catch fire. The oil is brought to the boil to start the polymerisation process. Linseed oil may be boiled at temperatures between c.285 and 300°C – any higher and it will catch fire spontaneously (called auto-ignition) and will break down and turn dark.[139]

The shape of the vessel also determines the process taking place inside and subsequently the kind of varnish produced.[140] Oil boiled in a pear-shaped kettle cannot be stirred easily.[141] It moves little of its own volition and its unsaturated fatty acids will polymerise and combine.[142] Not much oxidation takes places within the kettle because the surface of the oil is limited and the narrow mouth of the kettle prevents ladling and stirring of the oil in order to ensure a homogeneous temperature and introduce oxygen. On the other hand, an open-mouthed cauldron allows for easier stirring[143] – the surface of the oil is greater and continuous ladling ensures that oil is moved to the surface constantly during boiling thereby allowing it to oxidise, which promotes further polymerisation. Constant stirring and oxidation was reproduced in industrially prepared varnishes by means of a 'revolving stirrer' and a 'constant stream of air forced up from the bottom of the boiler and thus intimately mixed with the boiling oil'.[144]

When heated in the absence of oxygen, the oil will polymerise to a rubber-like product; in the presence of oxygen it will be more solid.[145] An ink made with a well pre-oxidised oil varnish that has also been boiled in the presence of oxygen dries quickly to a solid, smooth and shiny layer.[146]

The material of which the vessel is made influences the colour of the varnish boiled in it – copper colours the varnish green, iron colours it brown.[147] The majority of printing inks are black, and a tinted varnish is therefore not a problem. A pale coloured oil varnish is needed for coloured inks, especially white. Bosse therefore gives prescriptions for making clear, non-yellowing varnishes. Two lead vats are filled with very pale walnut oil and placed in the sun. One vat is removed when the oil is as viscous as thin varnish; the other oil is left to stand in the sun until as viscous as thick varnish.[148]

Viscosity

To test the viscosity of the varnish being prepared, a drop of the cooled liquid is pressed between the thumb and index finger and slowly lifted again to draw a thread. A varnish of low viscosity is 'short', ie it draws a short thread of a few millimetres – the longer the thread the more viscous or 'stronger' the product, up to decimetres long. When the oil is found viscous enough the kettle is removed from the heat and left to cool.[149] In small kettles, heating the oil may take from half an hour for the thinnest varnish to a few hours for the thickest. With kettles of several hundred litres it takes from a few hours to over 24 hours, the strength of the varnish increasing with every additional hour.[150]

Viscosities of two kinds are mixed for most inks, the kinds and ratios depending on the functions of the inks and on the required qualities.[151] For a common intaglio ink, ie for a standard engraving or line etching, a somewhat thicker varnish is needed to enhance drying speed and to ensure that the ink remains in contact with the paper. However, in order to counteract the difficulty of wiping this type of ink from the plate's surface a thin varnish is mixed in.[152]

For shallower structures, such as aquatint and mezzotint, thinner inks are needed that wipe off easily and leave a homogeneous tone. The disadvantage is that the thinner inks will result in staining on the back of the print due to leaching of the varnish. More ink is needed in the darker, deeper etched areas, which tend to turn brown over time due to the darkening of the varnish from a pale straw colour to a darker brown. The finest aquatints require the thinnest varnishes. In photogravures powdering on the top of the ink layer can often be seen because there is not enough binding medium left to allow the surface of the ink layer to adhere firmly to the lower part of the layer. Another consequence is that when too much of the thinner varnish is used for the ink in relation to the depth of the grooves in the plate, the design of the print will be visible on its verso as browned oily lines. The originally black ink on the recto side may also appear greenish or brownish due to bleeding of the varnish.[153]

Bleaching

Oils can be bleached before preparing a varnish for coloured inks to make them look brighter; black inks have no need for bleached oils. Simply placing the oil in the sun in the summer will suffice and in wintertime it can be frozen white.[154] Bleaching agents may be added when boiling the oil and bleaching is sometimes mentioned in recipes for relief printing ink. 'Vitriol', a salt that contains iron, copper or zinc sulphates in various proportions with traces of other salts, was used for bleaching.[155] The bleaching of oil seems to have been a thriving industry by around 1800[156] and might have been of interest to ink makers for the lighter coloured inks.

Modern commercial intaglio inks – except for the very latest kinds – have not changed much since the late nineteenth century and it is even claimed that the recipes of the inks made by the firm of Charbonnel (est. 1862) are still the same. The difference is that oils are no longer burned but heated in closed vats, which gives brighter varnishes and eventually creates a different printing ink.[157] Colour pigments have changed but the choice of black pigments remains the same. The latest development is the addition of an emulsifier to produce so-called 'water-washable' or 'safe wash' inks, which can be cleaned off the plate with water and soap after printing.[158]

Black pigments
Relief, intaglio and planographic printing use different types of matrices printed with different types of presses. Consequently they require specific inks, each with different constituents and of their own particular compositions. In comparison, relief and planographic printing use ink layers that are both thin and dense. A pigment with small particle size is required for such layers.

A large variety of natural and artificial blacks is available.[159] Naturally occurring blacks include graphite, black earth, powdered lava and pitcoal dust.[160] Artificial blacks are made from the charred stones of apricot and peach, coffee, cork, peat, pumpkin rinds, vine tendrils, and the shells of almonds, coconuts, hazelnuts and walnuts. Black pigment is also produced from charred animal matter, such as blood, bone and ivory, as well as metal compounds.[161] Since William Henry Perkin began research into artificial dyestuffs in 1856, a considerable number of artificially produced carbon-hydrogen compounds have become available, the oldest being aniline black.[162] These blacks have fine structures, but tend to discolour.

Lampblack
Lampblacks and carbon blacks are suitable as pigments for relief and planographic printing ink. These are pure carbons, very opaque and intensely black. The earliest form, 'lampblack', is made by the combustion of oil, fat, resin, pitch or asphaltum. The finer variety, 'carbon black', is produced by the pyrolysis of natural gas, later also mineral oil, available in the USA from 1864 onwards.[163] This black has the highest opacity of all the pigments because of its extremely small particle size.[164] It therefore allows for very thin and at the same time dense layers of ink. The main drawback is that lampblack and carbon black retard drying and therefore a siccative always needs to be added to the ink.[165] Judging from his densely black printing ink, lampblack was used for typographic ink by Johannes Gutenberg from about 1440. Technical sources on book printing from the sixteenth century onwards are unanimous about the choice of lampblack for book printing ink.[166] Three centuries later the inventor of lithography, Alois Senefelder, also found it excellently suitable for his black printing ink.[167]

Blacks for intaglio ink
For intaglio printing ink, a coarser black pigment is needed. With relief and planographic techniques the ink is applied on top of the matrix, after which it can be printed. With intaglio printing, the ink is rubbed into the crevices and cleaned (wiped) from the plate's surface again. If fine pigments such as carbon black or dyestuffs are used, the ink has a tendency to stick more to the plate[168] and streaks from the grooves become apparent in wiping. Too much ink is dragged out of them making it difficult to clean the surface of the plate without leaving enough ink in the grooves. A coarser pigment causes the ink to 'break' at the edges of the grooves and leaves enough ink in the grooves; the plate's surface can easily be wiped clean. Lampblack and carbon black also retard drying of the ink due to which the oil varnish can bleed from the ink into the paper over a longer period, which causes brown haloes around the ink deposits.[169]

Of the blacks available to the manufacturer of intaglio printing ink, only a few are mentioned more frequently, such as blacks from charred woods or kernels, and bone black or ivory black.[170] The carbon content, and therefore colouring power, of vegetable matter varies somewhat. Bone black contains 15–20% carbon and is well suited to intaglio printing ink.[171] Although common, the pigment is not mentioned often in historic recipes for intaglio printing ink.[172] Bone black is currently in general use as a pigment for intaglio inks.[173] Lampblack is occasionally found in intaglio ink recipes,[174] sometimes as the only pigment used, in which case perhaps a granular variety was intended – not so much a fine and flocculent powder but more granular or coke-like.[175] In other cases, when mentioned in relation to black intaglio ink, it is added as a 'toner' to enhance the intensity of the other black pigment used.[176]

A film of ink is left on the surface of the plate after wiping. This prints as a plate tone, visible as a faint hue on the impression and typical for an etching. The plate printer has to pay attention to the coarseness of the pigment in his ink. Carbon black gives sticky ink that wipes badly, leaving a lot of plate tone. Pigments with coarser grains, such as those made of charred vegetable matter or bone black, and even the more granular kinds of lampblack, are required because they give an ink that wipes easily and without plate tone. When the pigment is too coarse, however, it will abrade the metal and wear down the valuable plate fast, thereby limiting the edition of the plate as a whole and the number of good quality impressions in particular.

Frankfurt black

Plate printers had a penchant for a black made of burnt lees of wine above all other blacks.[177] The best quality came from the vine-growing area around the River Main in western Germany. It was traded through Frankfurt am Main and was therefore known as 'Frankfurt black' (Fig. 215). It is not the intention of the present study to describe every pigment in depth but an exception is made for Frankfurt black because of its predominance in sources on intaglio ink from the middle of the seventeenth century until 1900.[178] Around 1900 Frankfurt black disappeared from the market to be replaced by different blacks.

The first references to a black pigment used especially for intaglio ink and made from the charred dregs of wine appeared shortly before 1600.[179] By the middle of the seventeenth century Bosse mentioned that such a black came from Germany.[180] In his 1645 treatise he observed: 'The best black that is used for intaglio printing is called black from Germany, and comes from Frankfurt. Its beauty and quality are that it looks velvety black, and that in rubbing it between your fingers, it is crushed like fine crayon or crude starch. The counterfeit is not such a nice black, and instead of feeling soft between the fingers, it is coarse and gravely and strongly wears the plates. It [= the true black] is made of burnt lees of wine' (Fig. 216).[181]

In 1668 we find a 'Franckford-black' as one of the 'Colours to be used in Washing, which are not used in Limning' in *The Excellency of the Pen and Pencil*.[182] The name 'Frankfurt black' can be found from then until today in various languages.[183] The terminology is confusing, however, as the name 'Frankfurt black' could also refer to charred vine tendrils.[184] Occasionally lampblack may be meant when authors speak about German black.[185]

Production of Frankfurt black

A first, rather primitive production method of obtaining a black pigment from the lees of white (*sic*) wine is given by the Dutch author Gerard ter Brugghen in his manual on illuminating prints of 1616. The dregs are moulded to rolls, dried, charred, quenched in water, the white ashes scraped off and the black carbonised remains ground to powder in a (hand) mill 'just like mustard'.[186]

The Parisian dealer in *materia medica*, Pierre Pomet (1694), in his description of all the materials he keeps, is very precise. His *Noir d'Allemagne* is prepared from lees of wine, which are charred, quenched in water and ground in special mills (Fig. 217). It can be mixed with ivory black, which is of a better quality than the kinds prepared with charred bones or peach kernels, and good dregs give a good black. The black comes in lumps or powder, and looks shiny and moist, although it is not dampened with water, feels soft, and is easy to break without shiny grains. Similar blacks are made in Troyes, Orleans and Paris and their quality could have been as good as the German kind if only they had been made from good dregs.[187]

Johann Krünitz, in his *Oeconomische Encyclopädie*, reproduced details on the subject of Frankfurt black 100 years later.[188] Concerning the production method, he informs us that the dregs left after the distillation of brandy (*Branntwein*) are spread over a stretched piece of canvas; this allows the liquid to drain off. The dregs are kneaded into balls and dried in the sun. An earthenware pot is filled with such balls and covered with a well-fitting lid, which is cemented to the pot with loam. The whole pot is also covered with loam and burnt in a potter's oven together with the other ware. The balls come out as charred coals.[189]

Production methods were developed further in the nineteenth century. Johann Leuchs (1825), like Krünitz, stated that the best quality Frankfurt black was made by charring the yeast left after the production of brandy from the lees of white rather than red wine because the lees of red wine may give a reddish glow to the black.[190] Other qualities were made from the lees of wine and also from vine tendrils. The pigment was prepared in the same way as described by Krünitz, but charring in iron cylinders was considered to be better, with the vessels having a small hole at one end to let the gases escape during the process. Lye and cream of tartar, already present in the dregs, should be removed by washing the material with hot water, which is best done before charring. The lye in the unwashed pigment may saponify the oil in the ink.[191]

Some eighteenth- and nineteenth-century sources give additional ingredients to Frankfurt black, such as bone black, pitcoal dust or apricot kernels.[192] Frederick Goulding, the famous nineteenth-century London plate printer, recalled that although the pigment is 'made from the lees of the grape, after the wine has been pressed out', a maker of Frankfurt Black 'once told me he made some of his delicate black from the little twigs of the vine. The vine, it seems, gives the best carbon.'[193] This again shows how difficult it is to separate out the various blacks from their mixtures.

From the detailed descriptions of producing blacks from yeast and dregs by Josef Bersch (1893) it seems that production methods had reached an industrial scale by the late nineteenth century. He also clarifies one aspect of why this pigment was different from other charred animal or vegetable matter and preferred for intaglio ink. The yeast, he says, is already a loose matter by itself and falls apart when it is washed in water after charring thus levigation is not needed. Pieces of wood, bone or ivory still remain as hard chunks after charring and need to be crushed, ground and sieved to a fine powder.[194]

Disappearance of Frankfurt black

As mentioned above, Frankfurt black disappeared from the market around 1900. The term is mentioned frequently in twentieth-century reference works but generally in the past tense and with little detail about its production method.[195] Pigments with that name were produced from the residue of brown coal tar production or wood pulp earlier in the century.[196] The pigments called Frankfurt black supplied nowadays contain bone black and vine black.[197]

One suggestion as to why the true Frankfurt black disappeared is the fact that it was made by only a few small producers, in villages along the River Main, who lacked the production capacity to compete with the larger colour industries, which worked much faster and with materials that were not season-dependent. These few producers may have died out or directed their attention to other areas.[198] A further decisive factor would have been the diminishing number of establishments for intaglio printing; these would have given way to mechanical intaglio printing and other graphic processes.[199]

Additives

Various constituents may be added to printing ink to enhance or alter its performance. 'Toners' enhance or change the hues of the blacks and 'driers' increase drying speed of the varnish. 'Conditioners' may give more body to the ink, substitute expensive pigment for cheaper fillers, restrain binders from bleeding into the paper, or improve wiping qualities.

Toners

Black pigments are available in different hues. Carbon black is more intense in blackness than a vine black, while others may have a brownish or bluish tinge. The majority of black pigments for intaglio ink are made from charred organic matter; as this is not a deep black, carbon black may be added to enhance its blackness.[200] Originally, toners were blue colorants that suppressed or neutralised the brownish hues of black inks (blue and brown mixed give a dark grey) or gave the black a bluish hue to make it optically darker.[201] Another shortcoming of inks prepared with thin varnishes is that the latter leach out and turn yellowish brown, undermining the black of the pigment.[202] The earliest reference to a blue toner was by Andreas Glorez (1699) who suggested mixing a fourth part of indigo with the best intaglio printing black.[203] Further references to indigo and Prussian blue used as toners appeared from the eighteenth century onwards.[204]

Professional ink makers continued using blue toners in the nineteenth century whereas artist-etchers of the period increasingly preferred brown toners that gave the ink a warmer appearance. The first changes took place before 1820, when Ernst Bagelaar, an amateur printmaker, mentioned, alongside the usual indigo and Prussian blue, burnt Italian lake or 'glowing' brown-black as reddish toners.[205] Professional printshops, however, continued to use blue toners. What is not known, however, is to what extent his remarks reflected his private opinion or whether they represented a changing preference of a particular group of printmakers with whom he was in contact. Berthiaud, a professional plate printer, compiled a considerable amount of information on intaglio printing in the mid-1830s in Paris and in London. He developed a recipe for an ink of fine quality containing lampblack 'to impart a true and vivid tone missing to the Frankfurt black', and Prussian blue 'to give brilliance, for quick drying and to prevent the ink from turning yellowish'. Graphite is added to 'reduce the harshness' of the three other pigments and for ease of wiping.[206] In other words, he wanted a deep black ink that wiped easily and dried quickly together with the true white paper he mentions elsewhere,[207] a combination that would have suited the printing of the steel engravings fashionable at the time.[208]

Real changes came about instigated by artists connected with the French Société des Aqua-fortistes (1862–1867).[209] Lalanne, one of their influential spokesmen, mentions bistre, 'which loses its freshness and strength in the long run', and ochre (*terre de Sienne*) as brown toners.[210] For the next generation of artist-etchers the blacks should have a brown hue.[211] Sylvester Rosa Koehler, in his annotated English translation of Lalanne's text (1880), is clear: 'The trouble is that the ink used by ordinary plate-printers is of a disagreeably cold cast, as it is mixed with blue. Etching ought to be printed with a *warm* black, and sometimes, especially in the case of somewhat overbitten plates, with an ink of a decidedly brownish hue.'[212] Hubert Herkomer (1892) provided a list of browns and observed that 'black, alone, would produce an almost bluish tint; to obviate this, the warmer tints are added'.[213] Even orange and yellow pigments are mentioned as toners.[214]

Champour and Malepeyre, in the revised edition (1895) of their manual on printing inks, still advocated Prussian blue as a toner with *Violet de Paris* in only one recipe; not a single brown toner is mentioned.[215] They even announced that they had been working for a long time to create a deep black ink without any reddish shine.[216] This marks the difference between intaglio printing in the printing trade and the ideas of the modern artist-etchers of that time, who either ground their own black ink or had it ground to their specification.

The printing ink industry has continued to produce inks as described by Champour and Malepeyre; artist-etchers ceased making their own inks, and fashion changed. Nowadays commercial cool-cast black inks are supplied to printmakers, for which Prussian blue is mixed with the blacks.[217]

Driers

The pigment used for black relief printing ink, in comparison, is lampblack or carbon black. This pigment strongly retards drying therefore driers, or siccatives, always have to be added.[218] Ink containing a drier can be fairly easily recognised because until the nineteenth century litharge was used, the lead element always showing up in scientific examinations when present. Other lead, manganese and cobalt driers were introduced in the second half of the nineteenth century.[219] Driers are not found in recipes for intaglio ink from before 1800 and are only rarely mentioned thereafter.[220] The exception is Prussian blue that also has a drying effect when used as a toner.[221]

Black intaglio inks are made from organic blacks, charred vegetable or animal matter that do not retard drying in the same way as lampblack. Plates are inked and wiped warm. Due to the temperature, an added drier may cause the ink to dry too fast thereby making it adhere to the plate's surface, which is the reason why driers are rarely found in recipes for black intaglio printing ink. Modern intaglio colour inks, however, do contain driers. A thin varnish is used for these inks – it is pale so does not affect the colour except white and the brightest yellow – as it wipes more cleanly (and can be wiped cold) than black inks containing thick varnishes. A drier is added to ensure that the varnish hardens before it can bleed into the paper, which also prevents the image from turning brown over time.

Conditioners

Conditioners, also known as extenders, are chemically inert and are added to modify the properties of the ink without interfering with its colour to any great extent. The idea of enhancing or adding to particular properties of the basic ink recipe is not new – Ter Brugghen (1616), for example, advises adding egg white to the ink to give it more body and a nice dark hue.[222]

Conditioners are dry powders with little colouring power (low 'refraction'), such as kaolin, chalk, magnesium carbonate or aluminium hydrate, each with its own properties.[223] They are worked into the ink by the printer at the press, usually to make the ink stiffer or shorter. Kaolin and chalk give more body to the ink because they absorb oil varnish and facilitate wiping, although kaolin may also wear the plate faster because it is relatively coarse and gravelly. Magnesium carbonate gives more body and does not wear the plate, but is fluffy which makes wiping more difficult. Aluminium hydrate is also fluffy, absorbs the oil varnish, limiting the leaching out of the varnish into the paper after printing and preventing the formation of brown haloes around the ink lines. Too much aluminium hydrate, however, results in greater plate tone. Conditioners may already have been added to the dry pigment.[224]

Resins

Resins such as colophony, mastic or sandarac are always added when boiling oil for typographic ink; they give more body to the ink and help to limit bleeding.[225] Resins are considered inappropriate for intaglio inks because they create inks that stick too much to the plate in wiping. Nevertheless, a small proportion of resin may be added when boiling the oil to give more shine to the ink, an effect considered especially pleasing in portraits.[226] Resin-containing oil varnish for relief printing is occasionally used for intaglio ink.

Emulsifiers

Emulsifiers turn up now and again in printing ink prescriptions; they make the viscous ink shorter and easier to wipe off the plate. Bosse recognised that printing black ink on gold or silver leaf attached to paper was problematic and suggested mixing the ink with some oxgall, vinegar and kitchen salt to solve the problem.[227] Soap is sometimes found in recipes for typographic ink from the late eighteenth century. It was boiled with the oil as an emulsifying agent: this allowed the ink to offset more easily in printing and facilitated cleaning of the type afterwards.[228] There is also the occasional reference to soap in intaglio ink. Champour and Malepeyre (1895) give a recipe for a very fine quality ink used in de luxe printing containing some *savon de résine*.[229]

All the additives described above are those used more regularly. They act on the properties of varnish and pigment and are mixed in the ink in a rational way. Printmakers, however, tend to adapt their inks depending on the plate to be printed and the effects required. This is usually carried out more by trial and error with scant consideration for the long-term effects.

Modern developments

Developments in inks for manual intaglio printing from the later nineteenth century to the end of the twentieth century mainly concerned the choice of pigments with the more toxic vermilion, cadmium, chrome and lead compounds being replaced by the relatively harmless organic pigments now used.[230] Health issues related to the cleaning of the plates, not to the inks themselves, stimulated the search for a replacement of the ink's binding medium.[231] Following the example of oil paints that were replaced largely by acrylics, the first experiments with water-based intaglio inks from about 1990 involved the use of acrylic binders.[232]

Such inks did not prove successful in printing and had disappeared from the market by around the year 2000, by which time oil-based inks became available that could be cleaned off with soap and water only, the so-called 'water-washable inks'.[233] Specially intended for the printing of polymer films and solarplates, their pigments are very fine

grained and use carbon black for the black. The vehicle is soybean oil emulsified with gum arabic in water.[234] The ink is ideally suited to polymer films and solarplates because it wipes off easily from a plastic surface, but gives a lot of plate tone with metal plates. When shallow structures are printed on a thick absorbent paper, enough of the vehicle will bleed into the paper so that after a few days the impression is unlikely to continue to offset. Voluminous layers of this ink dry slowly and will continue to offset for a long time because only part of the binder bleeds into the paper and its surface dries by oxidation only.[235]

The most recent development concerns inks based on linseed oil mixed with an emulsifier such as propylene glycol. Although these are a closer match to classical intaglio inks they can also be washed off with soap and water.[236]

Colour pigments

Having discussed black we now continue with colour.[237] Light is a natural phenomenon that is present as waves of different lengths. The absence of light is observed as black, otherwise we speak of white or colours. Light is a mixture of a broad spectrum of light waves, altogether observed as 'white'. The length of particular light waves entering the eye determines the reaction within the eye (retina); this reaction is transposed in the brain to the interpretation of a particular colour. When we look at a coloured surface, such as a colour print, we see the wavelengths reflected – the rest of the light is absorbed by the material. In other words, colours – in the way we observe them – do not exist in the physical world but only in the human brain.

Colorants

In principle, all colorants may be used for colour intaglio printing inks providing their particles are not too coarse or too fine.[238] Fine-grained pigments and precipitated dyes with a particle size of a few microns are ideal – the particles should be small enough to prevent the printing plate from being spoiled in inking and wiping, but not so fine as to smear, cause streaks or leave too much plate tone in wiping.

Neither historical authors nor modern ink manufacturers are particularly detailed about the pigments and dye-stuffs used for their inks, but the palette of the colour printer of the past was limited – a few reds, a few yellows, some blues, a number of browns. Green pigments were a problem and were usually made by mixing a yellow and a blue, the same with orange and purple. The nineteenth century witnessed a dramatic increase in the production of artificial pigments and dyestuffs and in the twentieth century a vast amount of new colorants became available.

There are no known documentary references to pigments used in intaglio colour printing prior to the seventeenth century; the following details are therefore derived from ink analyses only. The few colour impressions known from the later fifteenth and early sixteenth century are in white, blue, green, brown(ed) and red inks. Some examples are given here. *The Madonna with Child in a Garden* (1465–1467) by Master E.S. is printed in white on blackened paper (see Fig. 44, p. 44). The white is lead white; the black background could not be analysed but it can be assumed that it was painted with a carbon-rich pigment.[239] Two engravings (1470–1480) by or after Andrea Mantegna, printed in a now yellowish brown tinge, demonstrate the probable use of yellow ochre mixed with woad (?) to make a green, but which browned because the blue woad has faded (Fig. 218).[240] Under the microscope two different grain sizes can be discerned, which could mean that two different pigments were mixed. Analysis of a *Hercules and Anteus* (c.1505) by Nicoletta da Modena printed in blue did not give any results but under the microscope relatively large 'lumps' of colorant were seen. This could indicate that woad or perhaps indigo was used.[241] From Agostino Veneziano we have a *Madonna Adored by Saints of the Dominican Order* (c.1525) printed *à la poupée* in red and blue (see Fig. 277). The red could be identified as vermilion mixed with some red iron oxide. The blue would have been woad or indigo.[242]

Early documents

Some documentary evidence on pigments and dyestuffs used in intaglio colour printing has come down to us from the seventeenth century and later. In his patent application (1637) Bosse merely tells us that for his colour printing 'all the colours which serve to the painting in oil' are used. He is hardly more forthcoming in his 1645 manual, in which he indicates that colours other than black, such as brown and lighter colours, can be ground to ink.[243] Translations of the manual contained no further details other than this and it took a century before further information on colour printing was published. Le Blon did not publish his procedures during his lifetime but a summary of his technique appeared in the revised edition of Bosse's manual of 1745.[244] The editor, Charles-Nicolas Cochin the Younger, also suggested that instead of using this difficult method it would be a good idea to ink the different parts of the several plates – so-called *à la poupée* – with different hues of brown to make copying a painting much easier.[245]

After Le Blon's death his former apprentice, Jacques-Fabien Gautier-Dagoty, claimed part of the invention of multiple-colour printing as his own, in particular the use of a fourth black plate to strengthen shades. To prove his claim, from 1749 to 1756 Gautier-Dagoty published some articles in which he also sketched his working manner.[246] His colorants were yellow ochre, vermilion, Prussian blue and ivory black or Frankfurt black; lead white was used only in mixtures.[247] The disadvantage of this choice of pigments is that they are all opaque – Le Blon had been striving for transparency so that the colours of the overprinted layers would mix optically. Cochin, probably referring to Gautier's print-

ing, expresses his regrets that since Le Blon's death only mediocre work has been produced, which looks too blue thereby effacing all other colours.[248]

The first proper description of Le Blon's colour printing process was published posthumously by Antoine Gauthier de Montdorge to counter all claims made by Gautier-Dagoty in 1756. Additional information confirms that Le Blon was in fact the first to add a fourth black plate.[249] The volume contains detailed prescriptions on making the blue, yellow and red inks for his three-colour system, with additional black and white plates.[250] Information on Le Blon's technique was well received and reiterated by later authors time and again in the eighteenth and nineteenth centuries. In practice, however, his method was seldom adopted.

Later eighteenth-century manuals say little about the choice of colorants, limiting themselves to recording a few pigments or dyestuffs – not the full range of colours needed for true colour printing. Halle (1761) suggests the use of vermilion for bright red ink and minium, English red lake (*englische Kugellak*) or Florence lake for dark red, with Prussian blue for blue. As he does not go into details on colour printing it would appear that he is merely referring to monochrome printing.[251] Joannis Bylaert published on multiple-plate printing in 1772, but only discussed printing plates in brown for which he used red ochre made by burning yellow ochre.[252] The choice of pigments was probably assumed to be common knowledge because, as Robert Laurie (1784) writes, 'those [colours] generally used by Painters are proper'.[253] We are better informed by sources from the earlier nineteenth century, when newly invented pigments, such as chrome colours, cobalt blue and zinc white, were introduced into colour printing.[254] Similar colours were used around the middle of the twentieth century: indigo, Prussian blue, yellow chromate of lead, crimson lake, red ochre and yellow ochre.[255]

Metal pigments

Throughout the centuries we find engravings and etchings printed with metal powders as colouring materials, the precious metal gold mostly being used for its lustrous appearance, particularly for quality prints commemorating special occasions. These have survived because gold is stable: it does not oxidise or discolour and retains its gleaming appearance. Silver is also documented but as it reacts with sulphur it will, in time, turn black thereby losing its appeal. Silver-printed objects do not seem to have survived or at least are not recognised as such.[256] Copper compounds (brass) turn brown or green. So far no historic prints have turned up in which metallic copper or a copper alloy was used for intaglio ink, but they would have been used for the cheaper prints that are unlikely to have been kept. Instead of metal, powdered bisulphide of tin (SnS_2), known as *aurum musicum* or *aurum musivum*, was available – this pigment has a metal-like, shiny yellowish appearance.[257]

There are three intaglio printing techniques for printing in gold:

1
    Oil varnish mixed (not ground) with the metal powder to make ink; the plate is inked, wiped and printed as with normal inks (Fig. 219).[258]

2
    The plate is printed with a base colour, the print is lifted and turned face up on the press bed. Leaf metal is placed on the top of the fresh ink and the whole run through the press once more (Fig. 220).[259]

3
    The same procedure as in (2), but instead of leaf metal, metal powder is dusted on top of the fresh ink and pressed against it (see Fig. 178, p. 195).[260]

The difference between the three methods is that with (1) the shine of the metal largely disappears as the oil varnish encapsulating the metal particles distorts the reflection of the gold, making the metallic ink look dull. The leaf metal in (2) is on top of the ink therefore there is no distortion and it reflects brightly. Powdered metal (3) maintains a grainy and more matt surface, while loose particles may escape and settle elsewhere in the print's surface.

Letterpress printing with gold was first carried out in the second half of the fifteenth century.[261] The method is occasionally described in historical sources and mostly concerns gold leaf, sometimes gold powder, applied on top of a sticky layer.[262] Brass powder and foil was used in nineteenth-century relief printing and lithography, dusted upon or stuck to the ink or varnish.[263] Metallic relief printing inks, prepared by mixing gold or bronze powder with a varnish, were recorded by the end of the nineteenth century.

Modern developments

A real break with tradition was the choice of pigments at the end of the twentieth century.[264] Of all the older synthetic pigments prepared from metal compounds only the ochres, ultramarine, Prussian blue, titanium white and zinc white are still retained, to which bone black and carbon black can be added. For the brighter colours, synthetic organic pigments only are used in intaglio printing ink: azo pigments for yellows, oranges and reds, as well as quinacridone pigments for reds, and phtalocyanine pigments for blues and greens (Fig. 221).

It was only with the invention of fine aluminium-bronze powders in 1928 that printing with 'gold' inks became more common as these powders are better suited for making inks.[265] For intaglio printing it took until the end of the twentieth century before gold- and silver-coloured inks came onto the market.[266]

Ink making

Before 1800 ink was made in the printshop itself, bought from a colleague or supplied by specialist ink makers.[267] The mechanical manufacture of ink developed in the nineteenth century bringing industrial inks and colours onto the market in various kinds and of homogeneous quality. Ink making by hand gradually disappeared from the professional printshop towards the end of the nineteenth century but was still carried out by artist-etchers at that time.[268] Printshops acquired their inks ready-made in tubes and tin cans. This also allowed the printer to work with a larger range of colours instead of having to grind colorants, each with their different properties, in small batches, and cleaning the ink stone after every colour.

With a few exceptions, all twentieth-century printshops and individual printmakers worked with factory-made ink with its obvious advantage over the slow, time-consuming and laborious process of grinding ink by hand. However, the downside is that commercial inks are general purpose or suitable for only one or a few techniques.[269] As a consequence commercial inks are often adapted for use by mixing in conditioners. Another disadvantage is that when the ink manufacturer changes the formula of the ink, for example by choosing a different pigment of similar but not the same hue, the printer has to deal with the newly formulated product.

Ideally, the plate printer observes the plate to be printed, discusses the engraver's intentions, judges what ink formula would be appropriate and prepares the ink accordingly. The ink will behave in its usual individual manner in inking, wiping and printing, and may be adapted when needed. Intaglio printing is very much a manual process and the ink with its particular properties plays its own role in the process.

Preparing by hand
The different varnishes, pigments and possible additives having been discussed above, all the constituents have to be brought together to produce the printing ink. For the preparation of ink first the various constituents are mixed to lock the dry powders within the varnish and to ensure that the individual particles are dispersed in the varnish. Next the mixture is 'ground', by which agglomerates of pigments or additives are further divided within the varnish and the larger particles are crushed more finely. The pigment should be incorporated into the varnish in such a way that every grain – together with any additives – is enveloped within the varnish so that no particle clusters or air pockets remain. The aim is to create a homogeneous paste so that all the ink behaves in the same way in wiping and printing. In drying the ink should form a flexible material without starting to powder, offset or bleed causing haloes. When mixing colour inks there is additional 'matching' to ensure that the ink corresponds to the required colour.

The procedure for mixing and grinding pigment and varnish by hand to make ink is as follows.[270] The pigment powder is scraped together into a small heap on the ink stone.[271] A hollow is made on the top into which the varnish is poured; if two or three varnishes are used, then these are mixed together in advance to make one homogeneous medium. The pigment is scooped with an ink knife from the sides of the heap on top of the varnish over and again, gradually mixing the varnish and pigment to a stiff paste. The manner of grinding the ink is seen in depictions of printshops from the late sixteenth century onwards (Fig. 222). In all cases, a paste is spread on a square stone slab and a stone muller, the shape of which resembles the top half of a large elongated egg, is placed on top of the oil and pigment mixture. The flat bottom stands on the slab and the ink maker leans upon the rounded top with both hands and makes circular movements with it. This is the actual grinding by which agglomerates of pigment particles are crushed and further dispersed in the varnish, the varnish encapsulating the grains, to produce a homogenous mixture with the consistency of a thick paste. Grinding a spoonful (2–3 cm^3) of ink in this way takes about 20 minutes.[272]

Variations of this procedure can be seen in the course of time but they generally involve a more intense mixing of the pigment and varnish. During a lecture in 1873, master printer Frederick Goulding explained this common method. The ink is ground by placing the muller with the flat part on the stone and pushing it away: 'holding the muller firmly at the top with both hands clasped over each other, begin to grind. Start at the side of the slab nearest the body, and, pushing heavily, push the muller to the opposite side; then lifting up slightly its further edge, drag it back without pressure, and so on evenly over the whole surface of the slab, occasionally scraping the outer edge and the sides of the muller, and putting the ink thus collected into the middle of the slab for further grinding.'[273] Lumsden (1925) describes and illustrates a tilted muller moved over the ink in a back and forth movement, gradually moving from left to right and back again over the stone (Fig. 223).[274] The advantage is that, instead of distributing all the force over the bottom of the muller, this position concentrates the pressure on a point on the rounded edge of the muller. It requires less strength and the ink maker does not have to lean with his full weight on top of the muller.

The kind of stone used for grinding plays an important role. A soft stone, such as marble, wears fast in grinding and

the ink will be loaded with fine stone particles that wear the plate, scratching its surface. This leads to more plate tone in the print, faster wear of the plate and thus to a smaller print run. A hard stone, such as porphyry or diorite, with a slightly porous structure is more suitable; its surface should be smoothened but not polished. The surface of such a stone has a certain grip on the ink in grinding – the particles rotate and roll and mix better with the varnish. Marble is mentioned, but because this stone is rather soft the much harder porphyry is preferred.[275] Granite is very hard and compact, and can therefore be polished to a high shine. Such a surface is too smooth for grinding so the ink maker will push the paste away with his muller instead of running over it to grind the ink. Berthiaud (1837) mentions that a glass plate and a glass muller are used for colour inks.[276] Glass is softer than porphyry and thus will wear sooner – it is only suitable for mixing colours or preparing small amounts of ink.

The consistency of ink depends on the viscosity of the varnish, the coarseness of the pigment, the ratio of volumes of both to one another, the amount of grinding, and any added constituents. Théodore Turquet de Mayerne (c.1630) indicated that the ink must be so thick that it could almost be cut with a knife.[277] What he does not mention is the viscosity of the varnish. Gessner gives proportions between pigment and thin varnish (1741). He describes mixing 'half a pound of black with about half of a seventh part of a measure of weak varnish' (about 225 g pigment to 0.1 L of thin varnish).[278] More thin varnish is added when needed followed by thick varnish (about the size of a small hen's egg).

Much depends on the viscosity of the varnishes and the fineness of the pigment, but Gessner's recipe is an indication of the possible consistency of this ink. Such recipes are rare, though – more often authors just suggest mixing pigment with thin varnish to a dry consistency and adding some thicker varnish in grinding.[279] Goulding (1873) discerns four kinds of black ink, increasing in thickness: from pure Frankfurt black ground with weak varnish alone, through mixtures of Frankfurt and French black with mixtures of weak and strong varnishes, to pure French black with strong varnish.[280]

Preparing by machine

Industrial ink manufacturers were established in the early nineteenth century but there are no descriptions of how the grinding was performed.[281] The French firm of Alauzet presented their ink grinding machines at the Exposition Universelle in Paris in 1878,[282] one of which may have resembled an illustration published five years later in *The Printing Times and Lithographer*. The machine worked with two cast iron mullers fitted with extra weights, which moved with a longitudinal movement over granite plates. The mullers were roughly triangular in section and the sharper sides moved over the stone slabs at a certain angle. The shape, position and movement of the mullers would have been based on manually operated mullers.

Earlier ink manufacturers kept their recipes secret.[283] As a matter of course, professional handbooks on ink manufacture appeared only in the later nineteenth century. The manual by Champour and Malepeyre (1895) gave detailed information on making intaglio ink. After first describing the old method (summarised above), they went on to discuss the more rational modern process. Varnish making was strictly controlled and carried out at specific temperatures during calculated periods.[284] The following day, first thin varnish was mixed in a kneading machine, the black pigment added and the whole kneaded for about two hours. Strong varnish was added and mixed for another 15 minutes, after which the mixture was ground in a roller mill until it became ink.[285]

The grinding was done in a three-roll mill (Fig. 224), a machine with three rollers, which could be made of granite, porphyry or steel around 1900. Seymour explained the differences thus: 'The stone grips the pigment better than the metal, and the grinding is much more effectual in consequence. There are, moreover, still some colours in use which have a tendency to alter by over-much contact with metal, and here again stone rollers can claim the advantage.' Steel rollers had to be cooled during milling by running water through their cores to prevent the varnish from polymerising; stone rollers did not need to be cooled.[286] The three rollers run against each other at different speeds, the second a little faster than the first one and the third a little faster again than the second one. This ensures that the ink, which is loaded between the first and the second roller, is picked up by the second roller from the first one and next by the third one. The friction due to the differences in speed causes the actual grinding. The ink is run through the mill several times, and with each consecutive run the distances between the rollers is decreased a little to crush the pigment agglomerates more finely and mix them more thoroughly with the varnish.[287]

Modern preparation methods for intaglio ink are not much different. The pigment is mixed with a thin varnish, a thicker one being added later if required. All Charbonnel inks, for example, are prepared with a thin varnish of 30 *poise*; thick varnish of 200 *poise* is only added to some of the blacks.[288] Mixing is done slowly and is interrupted regularly to avoid the varnish from getting warm, which would cause polymerisation and consequent thickening of the ink. Once the paste is ready it is kept overnight to allow the pigment to absorb the varnish. The following day the ink is ground in a three-roll mill. The distances between the rollers are decreased with every consecutive stage, except for the final run when they are increased a little again to make a homogeneous ink. Grinding time depends on the hardness of the pigment but can range from three hours for the softer to six hours for the harder pigments to produce 100 litres of ink.[289] Metal pigments are mixed only. Their particles are larger than those of colour pigments as they cannot be ground – if ground the grains would be crushed and lose their metallic properties, and simply become a greyish

mass.[290]

Keeping the ink

Until around the middle of the nineteenth century, printers ground their ink freshly each working day.[291] When not used immediately, or when the ink had been acquired from a specialist ink maker, the ink was stored in an earthenware bowl.[292] Tin cans and collapsible tubes for keeping ink were introduced in the course of the nineteenth century.[293] Earthenware bowls can be seen in various printshop interiors, usually with a stick poking out at an oblique angle, for example the *vase di tinta* (P) in Zonca's printshop (Fig. 225).[294] Gessner (1741) describes how freshly ground ink is kept in such a bowl covered with paper to keep out the dust.[295] Grinding was carried out in a special box in France in the eighteenth century (Fig. 226; see also Fig. 88, p. 99, the ink box is on the right):[296] the box could be closed to prevent the ingress of dirt, which could scratch the plate in inking and wiping.

The practice of grinding one's own ink was continued by the artist-etchers of the later nineteenth and earlier twentieth century, until disappearing around 1930.[297] As they did not print as often as professional plate printers, they would have noticed that the top of the ink dried to form a skin, which is when they came up with the idea of covering the ink with water to prevent this.[298]

When kept for a longer period than just a few days the ink will continue to dry to a deeper level. With the introduction of ready-prepared inks, printers stopped making their own ink and the phenomenon of skinning became a more general problem. To retard this, a piece of waxed paper is pressed against the ink by modern ink manufacturers. Pouring water on the ink delays the formation of the skin slightly, but drops of water may interfere in the printing process causing irregular lines in the print.[299] For the longer term the best way to keep ink is in a collapsible tube with a screw top.[300] This limits the introduction of oxygen to a minimum and the ink will remain in a usable condition for many years.[301] All inks were supplied in metal collapsible tubes and tin cans throughout the twentieth century, and this is how they were bought and kept by printmakers. The more modern water-washable inks containing gum/water mixtures or emulsifiers are stored in plastic boxes because they contain or might attract water; corrosion might occur if they were to be stored in a tin receptacle of any kind.

Interaction between ink and paper

Oil-based printing inks are usually considered to be inert, but some phenomena are, or are thought to be, related to oil-based printing ink on paper, which consequently influences the aesthetics of the print.[302]

Basically, as already stated, the pigment particles in printing ink are, and should remain, encapsulated in the varnish. Excessive bleeding of the varnish from the ink might remove too much medium from the ink, however. This would result in the pigment particles being uncovered, causing powdering of the ink. This can be prevented by thorough grinding when preparing the ink and by the addition of some more viscous varnish. Sometimes, as in printing photogravures, a varnish of low viscosity must be used for the best results. Such a varnish is so thin that a considerable quantity of it will seep away into the paper and in the course of time the dried ink layer will start to powder, possibly smudging the print's surface.

The lower the viscosity of the varnish, the more and faster the ink will bleed. In a modest way, this bleeding is necessary because it gives a better adherence of the ink to the paper and makes the ink feel drier.[303] Bleeding is evidenced by the halo that appears around the ink deposit. The shape of the halo may reveal something about the binding medium. For example, thin oil will seep faster and deeper into the paper, and spread further than a thick oil varnish. Bleeding of the varnish is commonly observed in engravings and etchings printed from plates with grooves that are relatively deep. Bleeding is also related to the amount of surface sizing on the paper, with the oil varnish seeping away more quickly into unsized paper.[304]

Haloes are colourless after printing, but when viewed against the light the paper around the ink can be seen to be transparent, turning yellowish or greenish to a golden tinge in time and finally to brown. The addition of driers in intaglio ink may limit bleeding, but they are not mentioned before the twentieth century, although Prussian blue added as a toner has a drying effect. Nowadays driers are found in nearly all colour inks except black.

The freshly pulled prints are piled up at the side of the press during printing. They may be interleaved with tissue paper to prevent ink from offsetting, a practice documented in 1805.[305] Offsetting is therefore a known phenomenon, seen in particular on the verso sides of earlier intaglio prints.

Some pigments in the inks may have a degrading effect on ink and paper. While the char blacks are inert, some colorants such as copper acetate (verdigris) or zinc oxide (zinc white) are reactive: the former because of the corrosive effect of copper on paper, the latter because of the photocatalytic properties of the pigment. Photochemical effects may include deterioration of the binder, whereby the ink is degraded from within by the zinc white. It may also promote the composition of peroxides from the varnish, which in turn may degrade the (modern) printing papers or the mounts, turning them brown locally.[306] A number of pigments and most dyes discolour due to light or chemical ef-

fects, while the oil varnish yellows. These reactions do not seem to have any influence on the paper, but they cause fading and browning of the coloured inks.[307]

Occasionally a white efflorescence can be seen on prints, which can be either mould or bloom. Mezzotints in particular may develop mould growth on the printed image. Water condenses on top of the dense parts of the ink layers in a cool and damp atmosphere, creating a favourable environment for mould.[308] So-called blooming or blanching may appear the same, but has a different cause. With thinner ink layers, the oil seeps into the paper, but with thicker layers, or when several layers are printed on top of each other, oil varnish may ooze out and form crystals.[309]

Printing Press

The principle of intaglio printmaking is that the image to be printed recesses beneath the surface of the plate.[310] The ink is contained in its engraved or etched intaglio structures and the paper will not come into contact with the ink if only placed on the surface of the plate. With a woodcut, the ink sits on top of the block and the slightest touch is sufficient to offset some ink onto the paper. With an etching or engraving the paper has to be forced into the grooves to produce an impression.

The following discussion on the roller press is extensive with good reason. The development of the press aimed at continuous movement of the machine in printing and was therefore essential for the quality of impressions. By 1800, this went hand in hand with increased print production, which resulted in the change from wooden to metal roller presses. Progress was slow over the centuries, but it was continuous – its many stages will now be documented.

Mechanics of printing

Various ways have been attempted over the centuries to make an impression of an intaglio plate. The quality of the impression depends directly on the manner of printing, the most successful being printing on a roller press. Its principal mechanism – a flat bed running between two rollers – has not altered since its introduction in the 1460s. All developments aimed at improving the functioning of the press concentrated on smoother running as this improves reliability and helps to achieve homogeneous impressions so that the entire edition is consistent. The system of rotation had already been proposed for typographic printing in the sixteenth century. Rotation was first introduced in textile printing, both in relief and in intaglio, from the late seventeenth century onwards, with patterns cut in the rollers. The explosive developments in the printing industry in the nineteenth century were based on the mechanisation of printing in all fields. Rotary presses were introduced to good effect for relief, lithographic and later offset printing, while one branch of intaglio printing developed into rotogravure. Apart from all this, a substantial number of manually operated roller presses – now referred to as 'etching presses' – are still produced, the larger part for amateurs and educational purposes.

Pressure

Comparing a platen press for relief printing with a roller press for intaglio printing elucidates the differences in their uses. The core of a wooden book printing press was a rectangular platen, which was pressed against the forme with the type. With such a construction all the pressure is spread over the total surface of the platen, where it touches the tops of the type. The pressure is supposed to be comparable to a weight of 10–20 kg per cm^2 of the surface of the platen (c.100–200 newtons (N)).[311] The estimated minimum pressure needed for intaglio printing using a press with a roller of 50 cm long compares to roughly 100 kg (c.1000 N) exerted on each axle of the upper roller.[312] In book printing, pressure is distributed over the total surface of the platen, while in intaglio printing pressure is concentrated on the line where the top roller touches the engraving.

If the roller exerted pressure directly on the plate, the metal would be compressed and the plate would flatten and extend.[313] This was the intention behind the earliest roller presses known: they were designed to flatten strips of soft metal, such as lead, tin, gold and silver. For intaglio printing, felt blankets are placed between roller and plate to apportion the pressure over a larger surface – the thicker the layer of felt, the more the pressure will be spread. The felt is resilient, which means that it will be compressed when passing underneath the roller, but will also expand again given the first opportunity, such as when there is a groove underneath. Ink is contained in the groove, paper is placed in between, the expanding felt forces the paper in the groove against the ink and in this way an impression is made.[314] The felt assumes its former structure again once it has passed underneath the roller.

The wooden roller press, 1460–1800

When copper engraving started in Europe in the 1430s, printing was not performed with a roller press, but by rubbing the back of the sheet of paper lying on the plate.[315] By 1460–1465, however, intaglio printing by means of a roller press was initiated.[316] The idea behind its construction and use was brilliant in its simplicity, although developments were very slow over the centuries and older types of wooden presses were still kept in use even when modern types of full metal presses were introduced in the nineteenth century. There were differences in design between different countries, but various types of presses were in use at the same time in the same place.

French press designs were influential in the seventeenth and eighteenth centuries, while England and the United States took the lead after 1800. Various ideas and inventions to alter or improve the wooden roller press were introduced throughout the centuries. Full-metal intaglio printing presses appeared shortly after 1810 and were in general use from the middle of the nineteenth century. Such presses were constructed from prefabricated cast-iron elements. In the last few decades of the twentieth century, steel pipes and bars cut to size were used, which changed the design of the frame. The essential construction of the roller press has not changed since the fifteenth century, however – the press still consists of two rollers held in a frame with a bed running in between them.

One major obstacle in researching the development of the construction of roller presses is that the seventeenth- and eighteenth-century sources on such machines are mostly of French origin. This makes it difficult to come to any conclusions about the level of knowledge and skills of press manufacturers in the rest of Europe. From the extant documents it can be deduced that there were local habits, but on the whole differences were probably small. The intaglio roller press was invented in the Upper Rhine area, and its use and construction spread from there. Although, the design did not allow for exotic constructions, the basic plan was guaranteed a wide dissemination from 1645 onwards due to the availability and many editions and reworked versions of Bosse's manual that contained a clear design with prescriptions for building a press.[317]

Apprentices of master engravers and master printers are another factor to be taken into account regarding the spread of a particular kind of press design. A typical case is the Florentine engraver Domenico Tempesti who spent his apprenticeship in Paris from 1676 to 1679. He diligently noted down what he found in the studios he frequented, but was summary about the etching press, referring to Bosse instead.[318] Another issue to be considered is the trade in presses but that would not have been a common occurrence within Europe, hampered as it was by the guild regulations that protected local craftsmen.[319] Moving overseas, the first engravers and plate printers who travelled to the English and Spanish colonies in the Americas brought their equipment with them.[320]

1460–1645

The presence and use of intaglio printing presses can only be deduced from the appearance and formats of the early prints themselves. The early presses would have looked like roller presses for flattening bars of soft metal, such as the machines that Leonardo da Vinci sketched around 1500.[321] The principle of his roller press is clear: two rollers of 'bell metal' are set in a frame, a crank is used for turning the rollers, and the rollers could be connected with cogwheels.[322] Leonardo took a keen interest in mechanics and apparatus. He worked on designs for a book printing press, but nothing is known about his possible involvement in intaglio printing.[323] Another example can be found in a book about alchemy published by Giovanni Augustino Pantheo in Venice in 1530 that has an illustration of a roller press for flattening strips of soft metal (see Fig. 115, p. 141).[324] The depiction of the press is realistic albeit that it illustrates a somewhat impossible feat of both drawing metal for shaping rectangular bars and the flattening of metal strips in one movement. Much like Leonardo's sketches, Pantheo's design was a basic construction of two rollers set in a frame, both rollers being turned by cranks.[325]

Early documents

The first reference to a press for printing copper engravings (*coperen plaetpersse*) with its implements is found in an inventory accompanying the settlement of a debt owed by the engraver Hendrik Terbruggen to Engele Hendrickx in Mechelen and dated 4 September 1540. However, the document does not contain any information on the construction of the press.[326]

Johannes Sambucus composed his *Emblemata, et aliquot nummi antiqui operis*, a series of 166 emblems that was published by Plantin in Antwerp in 1564. It was followed by a second edition enlarged to include 56 new emblems two years later.[327] The second (1566) and all later editions contained an allegory of typographic printing as invented by the Germans.[328] In the image on Sambucus's emblem the man in front is standing bent over, rolling a 'cylinder' over a pile of paper, *Fama* flying above him (Fig. 227). In the background on the left are three parcels of paper or prints stacked on top of each other on a bench. The bench continues to the right with a thin plate with two printing balls placed on it and ends in a kind of apparatus.

The woodcut is small and the contraption little more than schematically sketched, but we can discern a vertical stand or cheek in front, with two horizontal rollers extending to the back and a cross with six short arms attached to

the upper roller in front of the cheek. Perhaps the lines at the back underneath the rollers represent a second cheek. By comparison with contemporaneous images of typographic presses it becomes clear that a different kind of machine is depicted. A press for printing type and woodcuts has a platen that is moved up and down by means of screw and lever. The printer pulls the lever attached to the screw towards him and the platen moves down vertically, thereby forcing a sheet of paper against the inked type or woodcut. Because of the combination of elements and the knowledge that this cannot be associated with the typographic printing of which the verse speaks, we may deduce that we are seeing a printer, paper, plate, printing balls and a wooden roller press, thus making the woodcut on Sambucus's emblem the oldest known image showing an intaglio printshop.

A number of sixteenth and early seventeenth-century engineers published popular books of inventions, three of which also discuss roller presses.[329] The practical use of these publications is questionable; we should see them more as series of ideas or concepts rather than as machines that were actually constructed. Stradanus's interior of a printshop (c.1591) on the other hand shows a compilation of realistic elements, which compare reliably with similar later images (see Fig. 64, p. 77).[330] The design of Stradanus's press is comparable to that of other presses following it, but is unlike Sambucus's press. This suggests that in the meantime some fundamental changes in the design had taken place, such as the extension of the cheeks and the introduction of connecting beams above and below the rollers to create a more stable construction. The number of arms of the cross was reduced from six to four and the arms were extended, which allowed the pressure on the plate to be increased and at the same time resulted in a smoother-running press.

1645–1745

The model in Sambucus's emblem does not look like any kind of press depicted afterwards. This raises the question as to what extent the apparatus resembles earlier roller presses and whether the presses in Stradanus's printshop are perhaps of a new design. Wooden roller presses were portrayed with few differences from those in Stradanus's printshop until well into the nineteenth century, however, allowing us to classify these machines in three different types that represent developments over the next two centuries.

What is new?
The roller press type 1 is based on the design of Stradanus's press and confirmed by later models (Fig. 228). The all-wooden press as used in this period would have had two horizontal rollers held between two vertical beams extending above the rollers. The ends of the rollers were turned from the same piece of wood as the rollers themselves and fitted in double bearings sitting in the cheeks of the press. The sides or cheeks were secured by crossbeams at the top and the bottom of the cheeks, and the whole stood on two feet. Two arms extended horizontally from each cheek to serve as guards for the bed or table running between the two rollers. The space between the two rollers was just wide enough to allow the bed to pass between. The upper roller protruded on one side through a cheek, where it had a block instead of a turned end. This block fitted in the opening in the middle of the four-armed cross or star wheel. The printer ran the bed of the press with the plate, the paper and the felt blankets through the rollers by turning the cross.

Apparently, this last action was quite laborious as in the majority of printshop interiors the printer is shown pulling the cross with both arms while pushing with a foot. Although the illustrator would have made deliberate use of the dramatic figure, such a position makes clear that the press did not run smoothly and evenly but was being jolted because of the resistance the printer had to overcome. The principle of the roller press remained the same – all technical developments that were introduced aimed at lowering the resistance. A smooth-running press would be less labour-intensive and improve the quality of the impression, which was essential.

A thin layer of ink, a 'plate tone', is left on the surface and in the tiny little crevices and scratches of the plate after inking and wiping, which will be visible in the print. The ideal print requires that the ink should be picked up from all the grooves and the plate tone as light and even as possible. Running the plate through a jolting press shows in the print as darker and lighter bands of plate tone parallel to the roller; darker where the press halted, lighter where it moved again.

Looking further at the construction of the type 1 press, it can be seen that the cross has four arms, the diameter of both the rollers is the same, the ends of the guards are not supported, the feet do not extend beyond the length of the guards and the bearings sit rigidly in the cheeks, which means that the upper roller cannot move up when the bed is run through, and both pressure and resilience have to come from the felt on top of the bed. Large stones could be placed on the bottom crossbeam to prevent the press from overbalancing when the arms of the cross were pulled as this type of press has short feet (see Fig. 78, p. 92 and Fig. 222). Zonca (1607) described how the press was firmly set into the ground to prevent it from moving (see Fig. 225).[331]

In order to commemorate the centenary of the Jesuit Order in 1640, a book was published in Antwerp, their most northerly European base.[332] Among others, the book contained a series of allegorical prints with poems by Adrianus Poirters, one of them showing an Antwerp printer of devotional prints (Fig. 229). The construction of his press is clearly visible and although it is still a press type 1 – more specifically a copy in reverse of the roller press in the backroom

of Stradanus' printshop (see Fig. 222) – it has two differences: first, the feet extend beyond the guards, thereby creating greater stability, and secondly, the 'taps' of the rollers are no longer fitted between double bearings. The lower roller is lying in two bearings with space above and the upper roller is pressed into two upper bearings with space below, giving them room for movement. When the felt is removed from underneath the top roller, the roller will drop down a little to lie on the bed. The improved stability and the single bearings were the forerunners of the type 2 press.

Materials and sizes

With regard to the materials used and the sizes of the earliest presses, Zonca (but not other authors) let it be known that the two rollers and the bed were made of boxwood or pear wood, without knots. Boxwood is hard and compact but pear wood is not very practical as it is relatively soft and warps strongly when not dried properly.[333] Perhaps the use of these kinds of wood was uniquely Italian but it is more likely that Zonca suggested these woods without due regard to the consequences. The diameters of the rollers shown in his adjoining illustration are the same, in common with all other images of roller presses up to 1745.

A Paris *arrêté* of 1620 concerning a dispute between the Paris book dealers and the engraver and plate printer, Melchior Tavernier, summed up the differences between printing books, woodcuts and engravings. The construction of the press is roughly sketched in the text. The adjoining etching shows on the left a man operating a wooden typographic press and on the right a man operating a wooden roller press; at the back is a shelf in a corner with a grill, a dolly, a rag and a bowl (Fig. 230). The plate printer with his press is copied in reverse after Stradanus (the press on the left). The text indicates that the diameters of both rollers are the same and that they are made of nut wood.[334]

Presses were manufactured in different sizes. Plantin, who had a branch office in Leiden, installed a roller press in his house in 1582. The first edition of Waghenaers's *Spieghel der Zeevaerdt* was printed in Leiden in 1583, with the size of the largest chart plate being 39.5 × 55.5 cm. His roller press would have had rollers of about 2 ft wide in order to cover the width of the shortest side plus the margins of the paper on which it was printed.[335] The inventory of Volcxken Diericx, widow of Antwerp print publisher Hieronymus Cock, was compiled on 1 March 1601. At the end of the inventory 'a small printing press with its utensils' is described.[336] The adjective 'small' (*cleyn*) indicates that there were also bigger presses. This is confirmed by the inventory of the engraver Jan Jansz. van Doetechum compiled in Rotterdam on 23 January 1608. The inventory described a roller press with rollers of normal width, perhaps 2 ft, and a second roller press of half the size, say 1 ft.[337]

Bosse's press design

The third and last part of Bosse's 1645 manual concerns the press and printing.[338] Roller press type 2 is based on the descriptions and illustrations in this treatise and on the press depicted in Bosse's etching of an intaglio printshop from 1643 (Fig. 231; see also Fig. 68, p. 80). The designs were reproduced in all of the following published translations (Figs 232–235) with the exception of the first English translation that did not include the chapter on the press and printing. Compared with the type 1 press, a number of improvements can be observed. The feet of the press are longer, making it more stable. The columns between the ends of the guards and the feet, the horizontal crossbeams between the ends of the guards, and the perpendicular crossbeams between feet and cheeks made for a more rigid construction. The horizontal inner distance between the cheeks is '1 foot and 11 inches' (*1 pi 11 p*), while the rollers are slightly less in width. The height of the frame was just below 5 ft.[339]

Important improvements were made, intended to reduce friction thereby facilitating smooth running, to both the resilience and the construction of the press. Piles of cards were inserted in the holes of the cheeks on top of the upper bearings and then the bed was moved in between the rollers. Pressure could be increased by adding more cards. The cards would be further compressed when the plate passed through so that not all resilience had to originate from the blankets. This balance between felt and cards gave more flexibility, and this combination of blankets and cards has been used ever since.

Some water is squeezed from every sheet of dampened paper and absorbed by the felt blankets in making an impression. Printing continuously results in hardening of the blankets therefore they have to be changed regularly. When the plate passes underneath the top roller, the felt is compressed, leaving just enough space for the plate to move through. If the felt is too hard there will not be enough space, but with the addition of a pile of cards which give a little the plate can still pass through.

The taps and bearings are in contact with more than half of the inner circumference of the roller. A small sheet of tin (white iron) was nailed within the hollow of the bearing and this was greased with mutton fat daily to facilitate turning of the cross.[340] When the tap of a roller split or broke, a groove could be cut in the wood to fix the part with an iron band around it.[341]

The frame of the press, ie the cheeks, crossbeams, feet and guards, was made of oak. Walnut wood was used for the rollers, the bed and probably also the bearings.[342] Oak was commonly used for machines as it is tough and performs well under stress, such as with the high pressure needed for the roller press. Baltic and Dutch oak in particular improve in quality and become harder over time, while German and French oak soften. The rollers were turned from

quarter beams, which is a stem split in four.[343] One such quarter was turned to a roller – only the quarter was used and not the complete stem because the tensions inside the wood would cause it to crack if the complete stem was subjected to pressure in the press.[344]

There are differences in the choice of materials between the original French text of 1645 and the Dutch translation published in Amsterdam in 1662. According to the French text the rollers can also be made of elm wood (*bois d'orme*),[345] but the Dutch translation states that *bois de Guajac* is sometimes used.[346] *Bois de Guajac*, also *lignum vitae* (*Guaiacum officinale* L.), imported from the West Indies and Middle America, is one of the hardest and toughest woods and is even more resistant to wear than steel.[347] Its application in roller presses is found more often in later documents, such as in a 1695 Amsterdam auction catalogue.[348]

The type 2 press seems to have been the preferred model in this period but there were some variations. For example, while Dutch engraver Jan van de Velde IV was employed in the service of Maria Eleonora, the mother of Queen Christina of Sweden, in 1653–1654, he ordered an 'unusually large' roller press to be built.[349] One of the series of prints *Nobilissima artis graphices soboles* (1680) by Matthäus Küsel shows the interior of an engraver's workshop with printers busy in the backroom. Their press has perpendicular crossbeams between cheeks and feet, but because of the missing columns it looks more like a type 1 press (see Fig. 70, p. 82). The press in Luyken's *Plate Printer* (1694) is not copied after one of Bosse's etchings, but has a similar construction (see Fig. 91, p. 102). Note the detail of the cloth covering the bearing, probably to protect clothes and prints from grease.

Latest developments
By the end of the seventeenth century further developments appear. Andreas Glorez wrote a voluminous compendium in 1699 (containing an immense amount of practical information useful for business, house, estate and land owners etc.) that included an illustrated reference to the intaglio press (Fig. 236). The rollers of his press were to be of beech or walnut wood. His design was much like Bosse's, but with two differences. Glorez proposed the use of a press with two crosses, one on each side. The first cross would be connected to the upper roller and the other to the lower roller respectively. They needed to be turned by two people similar to Pantheo's press,[350] so the bed could run through the press more regularly. Glorez believed that this would result in an even tone in printing mezzotint plates. Some 180 years later Carl Barth again described a similar system for an intaglio printing press (see below).

A construction detail not mentioned by Glorez, although it is visible in the figure, was the spindles in the holes above the upper roller.[351] In the preceding two pages, Glorez had also illustrated a roller press for printing textiles with the same kind of spindles.[352] Contemporary to Glorez's compendium is a drawing in a copy of the 1669 German translation of Bosse (Fig. 237). The bearing with the pile of cards on top suggests a type 2 press. The columns at the ends of the guards are replaced by double perpendicular crossbeams on both sides of the cheek. Conspicuously present is the large spindle, running through the core of the cheek. Given its width and the sharp-edged thread it would appear that the designer had a wooden spindle in mind, such as those found in sixteenth-century typographic presses until they were replaced by iron ones, and in seventeenth-century linen presses.[353]

Balthasar IV Moretus, owner of the Plantin printshop in Antwerp, ordered a new roller press in Amsterdam through the Amsterdam paper dealer Ysbrand Vincent in 1714: *une presse de la dernière prefection pour imprimer ouvrages avec deux rouleaux, avec du bois de Guajac* (see Fig. 107, p. 114).[354] Apart from the *bois de Guajac* rollers, which we have come across before in Amsterdam sources, the bed was made of nut wood; in addition an ironclad bearing for the press (perhaps a spare) was supplied.

The construction of this Amsterdam press built *de la dernière perfection* is somewhat different from a type 2 press. The rollers are made of *bois de Guajac* and have a steel axle turning in iron bearings. The diameter of these axles (c.3 cm) could be much smaller than those of the wooden taps (5–8 cm) therefore the iron bearings are smaller than the holes in the cheeks. The most important benefit of using axles of smaller diameter is the reduced friction compared to wooden rollers, resulting in a smoother-running press. The press has no columns at the ends of the guides, but instead has two small rollers at either side of the lower roller supporting the bed, a feature not found again until the nineteenth century. Most conspicuous are the spindles. Mentioned and illustrated already in earlier documents, here is an actual example. Iron bars run through holes in the cheeks exerting pressure on the bearings of the upper roller. The spindles must be original because rods with a screw-thread of the same diameter keep the parts of the press together and the threads have the same pitch as the screws of the spindles. What this press has in common with a type 2 press are the two separate holes in the cheeks for bearings and cards, the two rollers are of the same diameter and the heavy beams of the frame are undecorated, but all other aspects of the designs are incomparable. Perhaps the Plantin press should be viewed as an example of the advanced technical expertise that existed in the Dutch Republic at the time.

Johann-Daniel Herz the Elder produced an extremely large *View of Jerusalem with the Crucifixion, the Ascension* (etc.) in Augsburg in the second quarter of the eighteenth century: the paper of the print measures 88 × 130.5 cm.[355] Since the smallest width of the paper is 88 cm, the rollers of the press must have been at least 3 ft wide.[356] Herz produced further prints of this size therefore he must have had a large press at his disposal.

1745–1800

The second French edition of Bosse's treatise of 1701 was almost identical to the first edition, and contained the same plates of the press. The third edition, however, was revised and augmented by Charles-Nicolas Cochin the Younger. The final chapter with the description and the plans for the roller press included a number of renovations, which formed the basis of the type 3 press (Fig. 238).[357]

What is new?

First it was recommended that the diameter of the lower roller should be enlarged in comparison to the upper roller.[358] A bigger lower roller would make the press run more easily and improve the quality of the impression. Plates 14 and 15 show that the ratio of the diameters of the two rollers was limited to about 2:3 or less. No measurements were given in the text or the plates, but manuscript notes in a copy of this edition commented that 'the upper roller of the printing press should have a diameter of 6 inches, the lower one 7 inches'.[359] Differences in roller diameters can be observed in roller presses from a later period and lower rollers with diameters up to three times that of the upper roller are found in nineteenth-century cast-iron presses.

Secondly, the radius of the inside of the bearings is larger than the radius of the tap of the roller, ie the taps and bearings touch only along a line instead of along half of the circumferences of the roller ends. Theoretically this reduces the friction between the two, again allowing the press to run more easily and smoother but in practice the taps would indent the insides of the bearings.

Thirdly, and most conspicuously, instead of two holes per cheek, there is only one large hole. The advantage is that the rollers can be placed in the frame and removed again by canting them instead of dismantling the complete press as would be necessary with the older types of presses.[360]

Other refinements include the bed tapering on one end, instead of being cut off square at both ends; a tapered end is easier to insert between the rollers than a square end. The perpendicular crossbeams have disappeared and instead the cheeks are wider. The lower roller not only has a larger diameter but also a block on one side, as does the upper roller (it protrudes on the other side). The idea behind the extra block is that, when the upper roller is worn, the lower roller can be turned and used as an upper roller. With the extra block it is no problem to attach the cross to it.

This third edition does not contain any new information on the kinds of wood to be used; the original text is simply copied. Again it states that instead of walnut wood the rollers can also be made of elm wood, to which Cochin added that it is of lesser quality and actually only suitable for the lower roller.[361] Elm wood cannot be turned properly and warps. For a lower roller this is less important because it is responsible for the traction and not for the printing proper.[362]

Geared presses

Christian Friedrich Gessner published a four-volume work on the occasion of the third centenary of the invention of typography. The third volume (1741) also discussed intaglio printing. Gessner based his text on a French edition or a German translation of Bosse dating from before 1745 but with a new addition. The frame of the press he depicted is of the type 2 kind, basically a straightforward copy of Bosse's 1645 press design. In addition, however, attached to the upper roller is a metal cogwheel with cogs hooking into a small lantern connected to a large flywheel (Figs 239 and 240). The purpose of this is easy to surmise: the press will run more smoothly. Gessner compared traction by cross with traction by flywheels and cogwheels: 'Without doubt the latter is better, because it is harder to print with the cross than the flywheel, because with the first one there is no continuous pull but irregular tugging; with the flywheel on the contrary the copper plate can be run through smoothly, giving a much better appearance.'[363]

Just as with the spindles in the Plantin press (see above), it should be noted that gears were commonly employed for machines as evidenced by Leonardo da Vinci's sketches of roller machines and in all the sixteenth-century books on mechanics, but up to that time they had not been used for intaglio printing presses. The article (*Rad*) that appears further on in Gessner's volume explains the use of cogwheels and remarks that gears are used in the intaglio printing press in order to make it run smoother and lighter.[364] This sounds positive but unfortunately there is nothing contemporary to which it can be compared. Perhaps we should interpret Gessner's text as a suggestion for renovation until other sources can shed more light on this matter. The use of wood concurs with Bosse, with the additional remark (also stated earlier by Glorez) that elm wood and sometimes beech wood is used for rollers.[365]

Twenty years later, a German six-volume work appeared with an overview of art techniques including the work of the plate printer. The author, Johann Samuel Halle, referred to various earlier publications. For example, he cited Gessner for a description of a roller press with cogwheels; so far nothing new. The illustration accompanying the text shows the parts of a type 2 press but it does not include a flywheel and cogwheels, and a six-armed cross has replaced the four-armed cross (Fig. 241),[366] a detail not mentioned in the text. The frame of the press is of a type 2 but the rollers resemble those of type 3 because of the differences in diameter, but here the upper roller has a larger diameter than the lower roller. All in all it is a rather hybrid construction.

Rollers of different diameter are described in the third French edition of Bosse of 1745, but its German translation

was not published until 1765. Four years earlier Halle's publication illustrated a comparable construction with the 'upper' roller of larger diameter than the lower roller; it is the other way around in the French treatise. Did the illustrator perhaps base his design on the illustrations in the third French edition without quite understanding its meaning? Or did he create his design from hearsay? It was, however, sensible to replace four arms with six to achieve smoother running of the press – the reduced distance between the arms of the cross allows for a more regular, continuous and faster movement of the rollers. A six-armed cross would have been used in other mechanisms but perhaps its application for a roller press was a local (German) construction.[367] Such crosses are found in English and French presses after 1800.[368]

Latest developments

Despite all the innovations and further suggestions, pulling the arms of the cross of the press remained an arduous task, not suited to the more educated craftsman. Plate printing, according to Reinhold, was therefore done by 'rough-knuckled' men.[369] The introduction of gearing for presses would provide the ideal answer to the problem of too much friction and the idea persisted, appearing a few times in eighteenth-century German publications, but none were as concrete as Gessner's proposal. This suggests that later authors adopted Gessner's idea in principle but it was not applied in practice.

Just such a description can be found, for example, by Johann Peter Voit in 1790.[370] The illustration accompanying the description shows the interior of a printshop with two different presses: the one in front with spindles, gearing and flywheel, the other a type 3 press with spindles (Fig. 242). The impossible construction of the gearing is immediately apparent in the press in the foreground. A large cogwheel is attached to the upper roller, hooked above and below in lanterns. The flywheel is attached to the upper lantern at such a distance from the press that the gearing is clearly visible. The axle of the flywheel runs through the upper lantern and then through both cheeks. It is attached to another lantern at the other side into which a cogwheel is hooked. The lower lantern at the side of the flywheel has a larger radius than the upper lantern. As the diameter of both rollers is the same, it is obvious that this construction was not based on practice. As soon as the printer pulled the flywheel the lanterns attached to the upper and lower rollers would operate at different speeds – the lower roller would turn faster than the upper roller causing the press to jerk or stick.

The spindles in the holes in the cheeks of the press at the back are the first elements that immediately attract attention as they are of the same design as the spindles in Glorez's press. The front spindle stands freely on top of the bearing and therefore is not functional. The second one is fitted into a plate fastened to the inside of the cheek and therefore can be turned to exert pressure. Cards are missing, as with the first press, which also shows a spindle at the further cheek. The cross of the second press is partly hidden, but it seems it has six or perhaps even eight arms. In summary, this is an unrealistic depiction of a printshop.[371] Some elements might have been taken from practice, however, as Voit also remarks that the taps of the rollers are rubbed with a warm mixture of tallow and olive oil every morning to allow them to run lighter.[372]

Swiss engraver Johann Rudolph Schellenberg was one of the few eighteenth-century engravers experienced in printing his own plates as most other engravers of his time had their plates printed by a professional printer.[373] Schellenberg described and illustrated a type 3 press. The frame was made from oak and the rollers from beech wood, maple wood or from another long and well-dried, fine-grained, hard type of wood. The upper roller was about 6 in. in diameter, the diameter of the lower roller a little larger. He advised acquiring large worn rollers used by cloth printers and arrange for them to be turned to the required diameter.[374] The bearings were smeared with pig's fat and tallow. This was a standard press – for printing big plates he mentioned a large roller press with a gearing and a flywheel.[375]

By this time large format presses with rollers of 3 ft wide or more were being manufactured relatively commonly. In 1770, James Basire engraved *The Field of the Cloth of Gold*, the plate for which measured 68.5 × 125 cm.[376] Specially produced large-format paper was ordered, but apparently there was no problem with finding a press big enough to print the plate. Presses with 3 ft rollers were mentioned by Querfurt in 1792,[377] and had become quite common in the first half of the nineteenth century as evidenced by two extant French presses.[378] Presses with roller widths of 1 ft, 1.5 ft and 2 ft were also available.[379]

Changing from wood to metal, 1800–1850

By 1800 the limits of performance of a wooden roller press had probably been reached and drastic changes were needed to make further progress. French occupation saw the abolition of the guild system, paving the way for enterprises that further expanded on the upsurge in industry as a result of the Industrial Revolution. The earlier development of the all-metal typographic press is reflected in the concept of the metal roller press.[380] Some parts of the wooden roller press had already been replaced by metal and by the end of the eighteenth century large presses with a gearing of metal cogwheels were becoming available – the wooden roller press was going to have to make way for the

all-metal press.

New designs

Englishman Robert Kirkwood received a patent (1803) for a press of which a part of the upper or lower roller was cut lengthwise, giving the roller a D-shape section. This allowed the bed to return automatically immediately after an impression had been made of a plate smaller than the circumference of the remaining curved part of the roller (Fig. 243).[381] This invention seemed to have been intended for printing large quantities, such as of papers of value, because a counting mechanism was attached to the press.[382] The concept also reappeared a few years later. M. Degrand of Marseille took out a *brevet d'invention* in 1810 for a similar kind of press.[383] Joseph C. Dyer's patent of 1810 (Dyer representing the American Jacob Perkins), described a similar (upper) roller, the so-called 'D roller (chiefly used by calicoe printers), for the purpose of allowing the table and cushion to return, by means of counterweights, after the impression shall have been taken'.[384] Kirkwood and Perkins's presses still had a wooden frame but could have metal rollers.[385]

Wooden presses with a five-, six- or eight-armed cross appeared regularly after 1800, a flywheel with a gearing was no longer unusual and various components of the wooden press were made of metal. Developments in the 1830s, as communicated by various authors, are outlined below and Figure 244 (from the Science Museum, London) provides a good example of a product of that period. The machine has wooden rollers with iron axles, the upper roller is made of *lignum vitae* and the lower roller is laminated. It has a single gearing with only one cogwheel and pinion (not a lantern as in eighteenth and early nineteenth-century French and German designs for gearings), the cross has six arms and the iron axles turn in iron bearings set in separate openings in the cheeks. The design, which is relatively slender as compared to the more bulky constructions of the seventeenth and eighteenth centuries, is also reflected in the cast-iron presses of the 1830s and 1840s (see below). Technically it has more sophisticated details such as the gearing and the iron bearings. The iron axle of the upper roller fits in the centre of the cross and is secured with a heavy nut, with a six-pointed cast-iron element firmly attached to the six arms of the press.[386] There is an extra shelf below the top crossbeam, the feet have square ends, and the cards can be protected by slim planks (not present) that can slide into clamps at both sides of the openings.[387]

Theodor Thon (1831), Carl Barth (1837), Berthiaud (1837) and Friedrich Netto (1840) discussed the latest developments in the construction of the wooden etching press on the Continent, by which time cast-iron presses had already been manufactured in the United States and England for 25 years.[388] Barth summed up new developments with an emphasis on the metal parts in the wooden press. Paris-based Berthiaud gathered material on roller presses and intaglio printing, visiting London as part of his research. Thon added his opinions in his translation of the publication by Aristide-Michel Perrot (1830) and Netto described his observations on recent press manufacturing.[389]

Berthiaud, the best informed, described seven kinds of roller presses of which he illustrated six (Fig. 245). He began with the press in the 1745 edition of Bosse (number 1, *la presse ancienne*), showing this type with eight columns instead of four. This old press, he commented, is used regularly and changes have appeared only lately.[390] His number 2 (*la presse nouvelle*) was almost the same, but was more slender with notably larger holes in the cheeks. Number 3 (*la presse à mécanique*) was like number 2, but with a simple gearing of a lantern connected to the cross and a large cogwheel attached to the lower roller, the teeth of which hooked into the lantern. Number 4 (*la presse mécanique à volans*) was larger with two cogwheels and two lanterns. It was turned by a large flywheel and had spindles. Press number 5 (*la presse mécanique anglaise*, not shown by Berthiaud) was imported from England and, among other things, had a gearing and iron rollers of which the axles fitted into copper bushes. With this model the bearings fitted tightly in the cheeks, and unlike the type 1 wooden press, there were no cards on top of the bearings. Berthiaud's appendix described the cast-iron press (number 6, *nouvelle presse mécanique en fonte*) and Kirkwood's press (number 7, but perhaps he meant the cast-iron version) as the newest inventions.

Decline of the wooden roller press

Despite the introduction of all-metal presses, wooden presses continued in use throughout the nineteenth century. The London printshop of McQueen's moved to their new premises at Tottenham Court Road in 1832 and in July 1833 bought three wooden roller presses from (Thomas?) Ross the Elder. A year later they bought an iron press and before the end of the decade several wooden presses were fitted with iron rollers, brass bearings and gearings, as well as repairs to various metal parts, by the firms of Pinner and Braithwaite Milner & Co.[391] When Charles Jacque published his article *Gravure et imprimerie en taille-douce* in 1852, his illustrations show at a glance two wooden presses being operated in a small Paris printshop of the mid-nineteenth century (Fig. 246).[392] It is possible that wooden presses were still being manufactured by the middle of the century, and older presses were fitted with new metal parts, but whether this was continued in the second part of the century is uncertain.

Some wooden presses continued in operation alongside metal presses. When the London plate printers Dixon & Ross were in need of extra workshop space in 1856, they were offered the hire of a room by a neighbour for three years, but the contract specified that they should use 'only the lighter sort of wooden cross press'.[393] Belgian, French,

German and English artist-etchers worked with wooden presses both before and after 1900 (Fig. 247; see also Fig. 89, p. 100).[394] Young artist Ernest Lumsden was happy to possess one: 'My own first press was obtained at an East-end auction room and was a most ancient affair. There was a travelling-bed several inches thick of iron-wood (*lignum-vitae*); no regulating screws; and, needless to say, no gearing. Nevertheless, though cumbersome, and by no means true compared with a modern all-iron machine, it answered my purpose well enough (all my early editions were pulled on it) till the day arrived that I could afford a better.'[395] As late as 1943 Wilson Silsby recalled etchers in Paris who (before the war) printed on wooden presses.[396]

Historic wooden presses have not completely disappeared – some are left and a few are still operated by print-makers, while some replicas or reconstructions have been built.[397] For example, the French firm M.D.R. of Louis Richebé manufactured, according to its owner, three presses with a wooden frame and metal rollers and other metal parts, based on originals from the early nineteenth century.[398]

The metal roller press, 1800–2000

The definite change towards a new generation of machines favoured the full metal roller press. The cast-iron press was clearly superior in material and use to the wooden press, but that did not mean the latter disappeared all of a sudden. Until the beginning of the nineteenth century the wooden roller press developed slowly, but between 1800 and 1850 there were both smaller and bigger changes, different models were in use at the same time, while wooden and metal presses were employed in the same printshop. The development of the roller press, from wood to metal, followed the progress of the typographic press that also moved from wood to metal, a move that began shortly before 1800 with the metal roller press appearing a decade later.[399]

Note that in discussions about metal roller presses a distinction should be made between cast iron and steel presses. Cast-iron roller presses – metal presses with cast-iron cheeks and rollers, wrought iron crossbeams, and bronze for bushes and perhaps some other details – were manufactured from the early nineteenth century until well into the twentieth century. Presses manufactured from steel plates, rods and pipes first appeared in the 1960s.

Predecessor
The full metal roller press referred to by Filleau des Billettes (1693–1698) needs to be discussed first. He noted that during the preparation of his treatise a new printing press (*une nouvelle presse pour les Estampes*) was invented at the Académie Royale de Peinture et Sculpture (est. 1648).[400] The press is much simpler (*beaucoup plus simple*) than the preceding one, by which he means the wooden press he described and illustrated earlier: *Envoicy la description*. The text stops about two-thirds of the page down and the remainder of the page is blank. It would appear that the description was meant to follow but nothing came of it.

The press is illustrated on the fourth plate in the manuscript (Fig. 248). The plate shows a printshop at the top with four men demonstrating the inking, wiping and printing of intaglio plates. The press left of middle is of a design never seen before. Its 31 components plus a felt blanket and a sponge are depicted in the lower part of the image and they show that the press is completely made of metal: it has an iron frame and metal (?) rollers with metal axles are placed in metal bearings. There are no cards above the bearings; pressure is exerted on top of the bearings by means of a spring above with one central regulating screw.[401] The top roller is turned by a crank attached to a simple gearing system with one small cogwheel hooked in a larger cogwheel attached to a side of the top roller within the cheek of the press. The bed running between the rollers is supported at both ends by rollers of small diameter. The press is standing on a wooden table. The scale at the bottom of the plate indicates that the bed of the press is 1 ft wide and about 2 ft long.

One of the reasons why the metal press of the new Académie des Arts did not find a following would have been a lack of communication. Although Filleau des Billettes prepared a text for publication in the 1690s it did not materialise. A complete change of attitude can be seen a century later with the introduction of registered patents containing detailed technical descriptions and illustrations, and new technical developments being widely published in journals. The development of the cast-iron press clearly profited from this dissemination of information.

Press engineers
Wooden roller presses were built by joiners and carpenters, only seldom were engineers involved in their construction,[402] a situation that changed with the introduction of the metal roller press. American engineers Jacob Perkins and George Murray designed a full-metal version of Kirkwood's D-shaped roller press in 1813, making this the oldest known cast-iron roller press for intaglio printing.[403] Perkins's patent of 1819, referring to the earlier patent of 1810 obtained by Dyer, is actually a summary of earlier patents.[404] His press has a cast-iron frame and rollers, while the bed is partly made of wood and partly of cast iron. As the steel block used to print from was so thick and heavy to handle, it was easier to fix it in the metal part of the bed, warmed for wiping by a heated block of cast iron that was replaced

from time to time as it cooled.

Although ingenious, this design would not have had a long life – working the heavy block was cumbersome and engraving the hard metal proved too difficult. Charles Warren's invention of engraving a thin steel plate in 1819 was more practical and did not require a specially designed press.[405] The London firm of Perkins, Bacon & Petch were ordered to print the first stamps, the penny black and the two penny blue in 1840, for which they used D-roller presses.[406] They must have abandoned the use of the heavy blocks by that time because the bed of one of their presses – presented by the firm to the British Library in 1936 – has no arrangement for inserting a heated block.

Many more were considering the design of iron presses in that period. For example, Englishman Richard Solly (1819) also presented a full-metal version of the D-roller press, the only wooden part being the mahogany press bed (Fig. 249). The press was 150 cm long, 135 cm high and the rollers had a width of about 50 cm. Both rollers were partly cut away and pressure was exerted by means of the lower roller. There was no cross, flywheel or crank as it was proposed that steam would power the press. After placing the inked plate, paper and felt in position on the press, running the plate through and returning the bed was done automatically, saving the printer time and labour – time that he could utilise for wiping the plate more accurately.[407]

The possibilities offered by cast iron in combination with steam or water power were very attractive. Edward Cartwright (1824) proposed three different ways of running a roller press using a power-driven bevel gear system[408] to replace the laborious task of turning the cross of the press; the bed was returned automatically. Additionally he proposed 'the combination of several printing presses, set round in a circle, to be actuated by one large rotary wheel in their centre, and having an annular or ring formed table travelling round between the several pairs of [conical] rollers'.[409]

Solly's proposal was targeted at the printing of Bank of England banknotes[410] but the design of his press offered many more possibilities. It has D-rollers with a 1 ft diameter giving a circumference of more than 3 ft, of which some 40% is cut away, leaving about 60 cm. The roller width is about 50 cm, thus the printable surface is also sufficiently large for printing the average etching or engraving. His figure 2 shows a plate lying on the bed, which, according to the scale, is 17.5 × 40 cm. Cartwright's press has conical rollers; the continuous action of the revolving circular table could also be used for larger plates.

Another American invention came from Cyrus Durand who received a patent in 1828. His press has an iron frame with a series of small rollers underneath that move over an iron or wooden bench; the bed is situated on top of the rollers.[411] The printing plate is placed on the bed as usual and the whole run by turning the cross, whereby the frame with the lower rollers and the bed moves underneath the upper roller. Durand claimed that by using his system 'the friction attending ordinary presses is almost entirely removed; the labour not so great, and the impression more perfect'. The remainder of the press, 'the cross, or levers, for turning the press, screws, &c are similar to those that are used in the common presses' and will therefore be made of wood, although the 'screws' suggest that these are turned in metal cheeks.

Press design

Whether and to what extent all these inventions, proposals and patents were used in actual practice is still open to research, but it is unlikely that they would have been long-lived. The fundamental design and operation of a roller press changed little as evidenced by a drawing by George Brookes from 1832 showing the then modern interior of McQueen's in their new building at Tottenham Court Road, with a metal roller press in front (see Fig. 88, p. 99). The use of cast iron, very popular at the time, which allows elegant, slender designs with curved elements and fine details, gives this press a completely different appearance from the heavily constructed wooden machines of earlier centuries. The press has a gearing of two cogwheels and pinions, and a large flywheel. Pressure is built up hydraulically by means of two screws on top. There are no stacks of cards between bearings and screws; resilience comes from the brass oil-filled containers.[412]

All the presses discussed above, with the exception of Solly's, have a lower roller with a larger diameter than the upper roller. The Ransome press has an upper roller of 21 cm and a lower roller with a diameter of 33.5 cm and a width of 50 cm. The trend for larger lower rollers continued throughout the century.[413]

Solly's design has a mahogany plank that measures about 50 × 83 × 5 cm. The 1832 press shows a wooden bed while the bed from the Ransome press was made of a single piece of 'Spanish or Honduras Mahogany', measuring 48 × 127 × 5.7 cm. In the years following, metal press beds were preferred, although there was some discussion. According to Chattock (1881), 'some of the best printers both in Paris and London have, after using iron, abandoned it, and returned to the wooden plank',[414] the advantage of wood seeming to be a modest resilience.

The benefit of a cast-iron plate is that it is hardwearing and because the metal is cast it will keep its shape over the years. However, it is brittle which poses the risk of cracks and breakage, and the iron may rust and possibly stain the printing paper – this can be prevented by placing a zinc plate on the bed.[415] Obviously wooden beds do not rust but they can warp due to changes in humidity and are indented by the plates, therefore they need to be planed from time to time; wooden rollers have to be turned for the same reasons.[416]

English developments

All new developments came from England but with American influences. Perkins first applied for English patents for his inventions from the United States and later moved to England to continue his work. English patents for all sorts of different concepts are found but surprisingly not one for a 'common' cast-iron roller press; the idea of using metal instead of wood for a roller press apparently was never patented.[417] How was it that a revolutionary change in material allowing superlative performance of the roller press went unregistered in the patent office? Is there a parallel here with the first metal typographic press which, unlike many later press designs and their details, also does not appear to have been patented?

The European continent followed English developments with keen interest. Austrian author Stephan Edlem von Keeß (1823) mentioned that new presses had iron top rollers.[418] Carl Ludwig Frommel brought a small iron roller press with him on his return to Germany from London in 1824, which may have been similar to Solly's.[419] The remarks about metal elements in wooden roller presses have already been discussed, and as Barth noted, English presses with gearings were imported into Germany but not looked upon favourably by the local plate printers.

German book printer Georg Jöntzen had a typographic press rebuilt in order to print lithographs between 1820 and 1822.[420] He continued his experiments and demonstrated a combined printing press built to his plans in 1836. Basically it was a book printing press in which the platen could be substituted by a scraper bar for lithography or a roller for intaglio printing, depending on the kind of printing needed, within five minutes. The printing forme could be exchanged for a lithographic stone or a copper plate. Placed in the coffin of the press bed, it was moved in position by turning the rounce, and the platen, scraper bar or roller was moved down by pulling the handle. This was sufficient for relief printing but for planographic or intaglio printing, the bed with the stone or plate was moved through the press by turning the rounce. Thereafter the scraper bar or roller was lifted again and the bed returned. The roller was made from *bois de Guajac* and turned in brass bearings.[421] Jöntzen gave a demonstration for a committee comprising three book printers, a plate printer and a lithographic printer. Although all of them appeared to wholeheartedly commend his press, no further information seems to be available.

A similar multipurpose machine offering even greater possibilities was patented by Englishman Alexander Prince in 1853. Pieces of the mechanism were introduced or taken out according to the type of printing required and for plate printing, two rollers were inserted; printing was carried out as usual.[422] Presses suitable for both planographic or intaglio printing were produced by various manufacturers in the last decades of the twentieth century.[423] The principle is the same as Jöntzen's design – either a scraper bar or a roller is fitted in position and printing carried out as he describes.

France

France viewed the inhabitants of the islands across the Channel with a certain suspicion around 1820. The English, as the victors in the Napoleonic War, had dented French pride. Articles from English journals about the recent technical developments were published in French journals and commented on by the editors, not always favourably however.[424] But at least the French found studying the latest developments in England worthwhile.

Berthiaud visited London and published a detailed report on English intaglio workshops in 1837. On the subject of metal presses he referred to a *Presse mécanique Anglaise*, very recently imported into Paris from England. It had rollers less than 40 cm in width and served to print vignettes and other small engravings. The rollers were made of iron, their axles fixed in 'copper' (bronze?) bushes set rigidly in the (metal?) cheeks with no possibility of movement, thus without cards above the upper bearings. The bed ran smoothly on two cylinders positioned between the guards on both sides of the cheeks. Other English presses he had seen did not have such cylinders, but were equipped with small horizontal rollers instead which kept the beds in position. The English press was turned by gearing, the heavy flywheel ensuring that the impressions were smooth and even, and Berthiaud was enthusiastic about the mechanism.[425]

Berthiaud is not sufficiently detailed to determine whether or not this is a full-metal press, but his next description is clear. A large press made by the French engineer Benoit (see Fig. 245, no. 6) had a frame, gearing and rollers made of cast iron with most other parts made of wrought iron. There were no cards to regulate pressure but whether it had a kind of spring system or if the press was turned by a cross or flywheel is not shown.[426]

Cast-iron presses were in general use in the second half of the nineteenth century, their designs becoming more robust (see Fig. 85, p. 98, Fig. 86, p. 99 and Fig. 108, p. 115).[427] These presses were built for heavy duty and a number are still functioning today. Metal, more than wood, allowed for the introduction of pressure screws, gearings and heavy flywheels. Greater pressure could be exerted with the bed still running smoothly due to the gearing system. Lines in steel plates are usually thinner than those in copper with finer lines requiring higher pressure. The development of the full-metal press therefore ran parallel to developments in printing the large steel engravings that were so popular in that period.

Decline of the metal roller press

Manual operations in the printing trade became more and more mechanised and there was a shift from intaglio tech-

niques to relief and planographic processes, these being less time-consuming and therefore cheaper. Intaglio printing was found to be the most difficult technique to mechanise, both for plate making as well as plate printing. Photogravure successfully combined photography and etching in Karl Klíč's invention from 1879.[428] It extended the usefulness of printshops for manual work because the possibilities offered by the process created a new generation of photographers wishing to convert their photographs into prints, with a mix between original works and reproductions as a result. Photogravure could also produce high quality art reproductions which, combined with the emerging discipline of art history, saw the publication of a large number of illustrated high quality reference works.

It was Klíč, too, who made a major contribution to the movement of intaglio printing into the industrial branch of the printing trade and away from any form of interpretation, either in the production of the plate or in printing. His rotogravure process stimulated many developments in the printing trade from the beginning of the twentieth century onwards and consequently the mechanised intaglio process grew to become the vast industry it is today.[429]

One of the last developments was the powered roller press. In addition to electrically heated stoves and electric lighting, roller presses with electrically powered gearing to replace turning the cross of the press by hand appeared in printshops around 1900. This again facilitated continuous movement of the bed of the press and reduced the amount of manual labour required.[430]

Following all these exciting developments there was less of a need for new hand-driven roller presses and once thriving manufacturers of metal roller presses had to close their doors or switch to other activities. The manufacture of cast-iron presses continued long into the second half of the twentieth century but in a modest way. Ledeuil, for example, was producing cast-iron presses until the 1980s. Relatively new companies such as Harry F. Rochat Ltd. (est. 1969) produce cast-iron presses of the same designs as those of their forerunners.[431]

Modern developments

New press manufacturing enterprises that emerged in the 1960s began to make use of the possibilities offered by new materials and techniques, and the first steel presses were built.[432] Steel plates, bars and pipes were turned into presses, the axles of the rollers placed in self-aligning ball or roller bearings instead of brass or bronze bushes. The cogwheel-and-pinion system was often replaced by a chain system that conveyed forces more easily and was cheaper to repair.

Not that this was needed to print with greater pressure – printing plates and their surface structures did not change that much but as steel is stronger than cast iron, less steel is needed for a press to resist the high tensions required in printing.[433] Following the designs of cast-iron presses, the first press beds were made of heavy steel plates that could distort or rust. Aluminium and synthetic (resin-and-fibre) plates are lighter and do not rust. Unlike aluminium, however, synthetic beds do not distort and are therefore preferred now.[434] It was the right time for etching to be taken up by large groups of amateurs and never before had so many students attended printmaking courses offered by art academies and colleges.[435] There was a demand for home presses resulting in a flourishing press manufacturing industry until many courses were dropped, professors were dismissed and printmaking studios closed between 1995 and 2005.

The printmaker's press

Returning to the nineteenth century, on the one hand there was the high professional level of engravers, press manufacturers, ink makers and plate printers, while on the other there was an emerging movement among professional printmakers and amateur etchers to create their own plates and then to print at least the proofs by their own hands.[436] The introduction of photography in the printing trade provided an extra stimulus for more hands-on methods of working and resulted in the foundation of a number of new associations of artist-etchers, the first being the Société des Aqua-fortistes, centred around the Paris publishing house of Alfred Cadart from 1862 to 1867.

One proposition circulating at the time, more in England than in France, was that the etcher should print his own proofs. Maxime Lalanne, in his highly influential *Traité de la gravure à l'eau-forte* (1866), guides the reader through the printshop of Auguste Delâtre in his discussion on printing etchings, while in the same year Englishman Philip Gilbert Hamerton expresses clearly that 'every one who etches ought to have a press in his own house'.[437] He underlined this by designing a small, cheap roller press in 1866 that was taken into production shortly afterwards by Roberson, the supplier of art materials (see Fig. 99, p. 106 and Fig. 100, p. 107).[438]

Following the demise of the Société and the death of her husband, the *veuve* Cadart carried on the business, supplying the requisite materials for etching including a small cast-iron table press especially made for artists and amateurs (Fig. 250); others followed, such as Janentzky & Co of Philadelphia.[439] More small-format presses were offered in the first decades of the twentieth century but not all were made specifically for the private etcher; some were designed for the professional printing of small plates such as visiting cards and labels.[440] In other cases, presses for smoothing photographs, leather presses and cloth wringers have all been used for the purpose.[441] The more success-

ful printmakers acquired larger presses, which were more comfortable to work with and allowed larger plates to be printed.[442]

Home-built presses
Throughout the centuries, presses of various sizes have been constructed: the earliest had rollers of a foot wide while those of the later professional presses ranged from approximately 1½ ft wide to 2 and even 3 ft. Small presses were used for small plates, such as devotional prints, visitation cards and the like (Fig. 251). Table models would have been for use by amateurs.[443]

The next step in the wave of do-it-yourself printmaking was the idea that the printmaker could build his own roller press, starting with Paton in the 1890s (Fig. 252).[444] This met with a certain enthusiasm and home-built presses of divergent designs were, and still are, constructed.[445] In a sense they followed in the footsteps of Bosse by publishing such plans, although he would certainly not have intended the engraver or amateur to personally construct his own press.[446] Bosse's plans were intended for those amateurs who lived in areas remote from large towns where plate printers operated. Such a case is explained by Paul V. Ulen who, in 1936, described how the machine shop at his school in Cleveland, Ohio, manufactured the press for the printing class because a good quality press was not obtainable.[447]

There are many more examples of home-built presses, one of the most common being the adaption of an existing type of roller press, such as a mangle, to meet the needs of a plate printer. Various other types of roller presses were and still are used by bakers, plumbers, photographers, shoemakers, stained glass workers and silversmiths, all of which at different times were converted into printing presses by etchers.[448] In the absence of a roller press, plate printing can also be performed on a lithographic press.[449]

Mechanisation of intaglio printing

Leonardo, Pantheo, De Caus and Fludd all described manually operated roller presses for flattening strips of lead or tin; these developed further into big machines driven by water power for laminating lead plates in the eighteenth century.[450] Textile printing had used rotary presses from the end of the seventeenth century until the 1780s; such machines had the designs cut in relief on the rollers.[451] The process of intaglio printing on textile was the same as on paper in that period.[452] Changes came about with the introduction of another printing medium – the grooves of the plate were not filled with an oil-based ink but with a mordant, usually aluminium or iron acetate, which prepared the cloth chemically in order to accept the colorant in the following dye bath.

Rotary presses
Textile printing was still done from flat plates until Thomas Bell patented a copper roller for intaglio printing, to be engraved only after fabrication, in 1783. His machine was first operated at Livesey Hargreaves & Co. in Mosney, Lancashire (England), and later on by Christophe Philippe Oberkampf in his Jouy manufactory, close to Versailles (France). The core of Bell's press had three rollers on top of each other. Above was a cast-iron compressor roller, in the middle the engraved copper roller and below the feeder roller, dipping into a tray filled with mordant. Two blades scraped the mordant from the surface of the copper roller. The fabric was fed continuously between the top and the middle roller allowing as much as 5,000 metres of cloth to be printed per day.[453]

The mechanisation of intaglio printing on paper was considerably more difficult than that of typographic and lithographic printing. Throughout the nineteenth century various machines were developed for inking, wiping and printing intaglio plates mechanically. Straightforward cut plates, such as those for visiting cards, could be printed using them but not plates with fine structures.

Jacob Perkins patented hand-operated roller presses for the printing of engraved steel plates for banknotes in the USA in 1813 and again in England in 1819.[454] Another model patented in 1819 was only partially mechanised – it still printed flat plates and was little more than an attempt to reproduce manual work.[455] Robert Neale invented a machine that could ink and wipe a flat plate automatically in 1853, with improvements two years later. He was awarded a medal for his machine at the Paris Exposition Universelle in 1855, the jury concluding that the machine was good for printing stamps and train tickets, but not for artwork.[456] A possible variation on this machine was a rotary press, suitable for printing musical scores, patented by the American engineer J.F. Starrett in 1857.[457]

Ideas derived from rotary textile printing were also applied to intaglio printing on paper, such as the rotary intaglio press patented by Constant Guy in 1876.[458] One or more plates were inked at a time, cloth wiped and printed, and the paper was also fed automatically. The machine was demonstrated at the Paris Exposition Universelle in 1878 and attracted a large crowd.[459] The firms of Bradbury & Wilkinson of London, Waldow of Leipzig and Monet of Madrid showed interest and more such machines were constructed in the years following.[460] These presses could be used for small-format steel engravings such as letterheads and labels. Editions of 1,000–1,500 per hour or

6,000–9,000 per day were reached.[461] The machines were only suitable for straightforward linear work, however, not for tonal processes such as aquatint or mezzotint. Photogravure remained associated with manual intaglio printmaking because its printing could not be mechanised.

Guy also exhibited a rotary intaglio press with the design engraved or etched in a cylinder to be printed, but it was not operated at the exhibition.[462] His idea proved to be visionary, however. With the invention of rotogravure by the end of the nineteenth century, rotary intaglio printing on paper became highly successful and developed into an industry of its own.[463] These new processes, however, are completely detached from classical etching and engraving as both the production of the plates as well as their printing are mechanised, leaving no scope for personal interpretation.[464]

Printing Procedures

In printing, the plate, the paper, the ink, the wiping and the press all come together. It is this combination of elements that determines the quality of the print but from here on everything depends on the skills of the individual printer. Two printers working with the same materials and under the same conditions may nevertheless produce two dissimilar prints. This difference is due in the main to the wiping of the plate, which is the action of an individual. The printing procedures (discussed below) are applicable in general but apply more in particular to the printing of single plates with black ink on white paper. Colour printing involves the use of one or more plates for impressions in one or more colours.

Preparations

Once the image on the plate is complete, the plate, paper, ink and press are made ready for wiping and printing.[465] Metal scrapings on the engraved plate, which may scratch the image in inking and wiping, are removed and the plate's surface is given a final polish. The etched plate is rinsed in water, and the ground is removed along with any wax rim, stopping-out varnish or coating on the edges and back of the plate.[466] Plate edges are bevelled and polished, and corners rounded to remove any accidents at the edges and to form a facet.[467] Bosse scathingly refers to the printers whose work this is, 'but frequently enough they print the plates just as they are given them', leaving it to the engraver to bevel and burnish the edges himself.[468] The edges must be smooth and the corners rounded to protect the printer from injury when wiping, to prevent paper and felt from being damaged in printing, and to avoid any ink from being retained in damaged areas that would show in the print. The facet facilitates the movement of the plate underneath the roller without the press halting or the lower roller slipping. It also prevents the paper from breaking at the plate edges when passing underneath the rollers.[469]

Preparation of the paper
A handmade sheet is checked for knots and grit, which are removed before dampening.[470] With modern machine-made papers this is unnecessary as the sheets are smooth but some Japanese papers might still require checking for lumps or knots.

Paper is dampened with water, usually in advance to ensure that the sheets are homogeneously damp and that the water has penetrated the fibres sufficiently.[471] The amount of water absorbed by the sheet should be enough to allow it to be pressed deep enough into the crevices to pick up ink everywhere. If it is too dry the paper cannot be forced into the grooves properly so it will not pick up enough ink, resulting in a thin impression. On the other hand, if it is too damp the wet paper and oily ink may repel each other. Not enough ink is picked up, resulting in blotchy instead of continuous lines, and in speckled instead of even tones.[472]

The water for dampening, kept in a tray or trough, must be clean to avoid soiling the paper and free of metal salts to avoid future staining. No liquid other than water can be used because of the strong attraction between water and cellulose molecules.[473] Félix Buhot, working in the last quarter of the nineteenth century, dampened his paper with turpentine. The turpentine sinks in between but does not penetrate the fibres because it has no polarity. In printing the turpentine dissolves the ink a little, an effect that was apparently interesting to Buhot.[474]

The sheet is held with two hands and passed through the water in a continuous movement, lifted vertically to allow the excess water to drain off and laid flat on a board next to the tray.[475] The following sheet is placed on top of it, the third and so on. Air bubbles are flattened to avoid differences in the dampness of sheets, which may cause the printing paper to pick up ink haphazardly or cause creases. Sheet after sheet is dampened; a skilled printer can hold four sheets between his five fingers at a time, running them through the water in one pass. If the sheet is only

lightly sized it can be treated with a solution of alum in water to tan the sizing, a procedure especially recommended for prints that are to be hand-coloured afterwards. As tanning renders the sheet less penetrable, the watercolours are prevented from seeping into the paper too much.[476]

The sheets are piled up between boards and some sort of weight placed on top; alternatively the pile is placed in a standing press.[477] With unsized or moderately sized paper, wet and dry sheets can be piled up alternately. The amount of water absorbed by the wetted sheets is enough to dampen two sheets and allowing them to stand overnight ensures diffusion of the water throughout the pile. After some 24 hours or so, all the sheets will be homogeneously damp and ready for use.

Historically fir rather than oak (the tannin in which can stain the paper) boards were used, in between which the dampened pile of paper was stacked; nowadays thick glass plates are used as glass does not stain the paper and the plates are heavy enough not to require any added weight.[478] Keeping the pile of damp sheets between boards or glass plates has the disadvantage that the edges of the sheets may dry out while the core of the pile remains damp. This creates tensions in the sheets, which cockle and then crease in the print. This is avoided by wrapping the wet sheets in a sheet of plastic, called a 'wet pack', before being placed between boards.[479] Printshops dampen the paper in advance and keep the pile of damp paper in a wet pack ready for use.

When the dampened sheets are piled up, the water penetrates into the paper fibrils which then expand, filling the gaps between the fibres; the sheets become pliable and the total printable surface increases.[480] Dampening time varies from a few hours to overnight or even a few days[481] depending on the kind of paper to be used: unsized paper absorbs water quickly whereas well-sized paper rejects water.[482] It also depends on the technique to be used for the printing plate. Printing a mezzotint plate, for example, demands a sheet dampened some days in advance to ensure that it is pliable enough to pick up all details.[483]

Instead of piling up sheets wetted in a trough with water, other forms of dampening are also found. The sheet can be brushed with a wet sponge, for example, but the sponge has to be manipulated carefully to avoid damaging the surface of the paper.[484] The disadvantage of this method is that the sponge may pick up and retain mould from the sizing on the first sheets of paper that may eventually cause staining of the subsequent sheets. A better option is to use a clean water sprayer filled with fresh water for each use.

Another method popular in the twentieth century entails soaking the sheet in a bath of water. Before printing the sheet is taken out and blotted between old newspapers or towels to remove excess water. The blotting is time-consuming, takes up working space and is therefore only suitable for small print runs.

Dry paper can be used for printing when working with photopolymer films and solarplates due to their shallow textures. The result is a contrasting impression without refined halftones.[485] Parchment and oriental papers are not pre-wetted but placed in a pile of already damp sheets a few hours before use. One sheet of parchment or oriental paper is placed between two damp sheets of European paper, which is enough to dampen them.[486] A modern technique for dampening particularly sensitive materials involves placing the sheets between acid-free chipboards that have been lightly sprayed or brushed with water 15 minutes in advance.

Dampened paper expands a little and when a damp sheet passes through the roller press it stretches further.[487] This is the cause of failure in registration when printing *au réperage*. Many techniques are suggested to overcome this problem but none is perfect and at best the deviations are masked. Two modern methods, however, give good results. With a heavy (600 gsm) compressed paper, water permeates only the surface of the sheet during dampening, making it soft. The core stays dry, the sheet does not expand and there is no lateral stretch. Another solution is to use a hydraulic press with a platen that moves down vertically.[488] This has the advantage that all the paper stretch is used to mould the sheet into and around the plate. Here, too, there is no lateral stretch and thus registration is optimal.

Preparation of the ink

The printer who ground his own ink usually did so at the start of the working day.[489] Ink was supplied ready-made in collapsible tubes and tin cans in the course of the nineteenth century.[490] Freshly made ink is smooth and buttery without skin whereas a black ink of a few days to a week old is stiffer, the top layer of the ink oxidises and a skin starts to form. It is therefore worked with an ink knife or muller to loosen it.[491] The mixture of pigment and oil varnish becomes smoother and more fluid by grinding due to the so-called 'thixotropic effect',[492] thereby facilitating easier wiping of the ink from the plate. The printer works the ink with a knife to make it more fluid just before printing. A freshly ground ink may be too fluid, however, and may need a little time to settle. There are no records to indicate just how much ink was prepared per day by an ink maker grinding by hand, but it is likely that just enough was made to meet the day's production. Some printers prepared ink for others.[493]

Preparation of the press

Preparation of the press involves setting the right pressure, positioning the blankets and placing some backing paper on the bed of the press. With the earliest presses – roller press type 1 and its forerunners – the ends of the rollers were set in bearings placed firmly in the cheeks. All flexibility was provided by the felt blankets lying on the bed of the

press. Pressure could be increased by adding another blanket or by placing some sheets of paper underneath the plate. With roller press type 2 the bearings moved vertically and paper cards were placed in the space above the upper bearings. This made the press more flexible and allowed for some fine tuning. Type 3 had more space above the upper bearings, allowing regulation of pressure and resilience by means of a pile of blocks and cards.[494] Most metal presses have screws on top of the upper bearings to regulate pressure. They usually have cards, sometimes strips of leather or felt, or disc springs, between screws and bearings for resilience.[495]

Setting the pressure is based on experience and habit. It depends on the thickness of the plate, the texture of the image (a mezzotint needs less pressure than an engraving) and the number of blankets. It is important that the pressure exerted on both ends of the top roller is equal otherwise the bed of the press will jerk causing it to move to one side instead of running parallel between the arms of the press. This could result in uneven printing of the left and right halves of the impression.[496]

Blankets are placed on top of the printing paper, sometimes with maculature or tissue paper in between. Woollen blankets are made of felt; occasionally flannel or serge is used for their flexibility during printing. The wool will only become hard when the blankets get wet, when too much sizing is taken up from the damp paper and when used for prolonged periods. The felt needs to be smooth and even to ensure a homogeneous impression – any flaws or damages in a blanket will be visible in the impression either in the plate tone or as a variation in the quality.[497] The felt may be woven or unwoven, but the texture of woven felt is often seen in plate tone as a somewhat darker mesh.[498] Modern printers occasionally use other materials such as foam plastic or rubber sheeting – which is smooth – to avoid any texture showing in the print.[499]

Loose blankets are commonly used. With one end underneath the top roller they are lifted and flung over the top roller after every run in order to remove the impression and the plate. Halle (1761) shows an illustration of the interior of a printshop based on Bosse's interior of a printshop of 1643, or one of its copies. A newly added element is the felt stretched over the top of the press.[500] Halle's illustration depicts both ends of the blankets lifted and tied together over the top of the press, an arrangement found more commonly after that date.[501] The advantages are that the blankets do not need to be lifted and flung back over the top roller, which saves time, and the expansion of the felt cannot move the paper, which occurs with blankets placed on top of the paper. The disadvantage is that it takes time to change the blanket when it needs to be replaced.

The pressure being set and the felts flung back, some sheets of paper are positioned on the bed of the press. Maculature sheets were used for this in earlier times, tissue paper in modern times.[502] The printing plate will be placed on top of this to prevent the bed of the press from being stained with ink offsetting from the back of the plate. With some care, the same maculature sheet can be used time and again without soiling the printing paper. When a smaller plate is placed on the same sheet, or when the same plate is not placed in the same position correctly, the printing paper will pick up some ink offset from the back of the former plate onto the maculature sheet and from there onto the new impression. This shows as a darkish area next to the embossed plate edges (Fig. 253). Another sheet is placed on top of the printing paper before covering the whole with the felt blankets. This sheet may be used repeatedly before becoming soiled, and may be dampened with a sponge for the first run to make it softer. There is no need to repeat this dampening on the second run because it will remain sufficiently damp and resilient.[503]

Inking and wiping
Once everything has been prepared, then the plate is inked, wiped and printed.[504] All grooves need to be filled with ink, but as already pointed out it is the wiping that determines the quality of the impression. The plate printer may enhance the quality of the image by his choice of ink and manner of wiping, but his working methods will also have an influence on the wear of the plate and thereby on the number of impressions that can be pulled.

Inking
In earlier times the ink would have been taken from the container and spread bit by bit with a wooden stick over the surface of the plate or applied to the plate with a dabber.[505] Since the introduction of ink in tubes, however, the ink is squeezed from the tube directly onto the plate. Originally the plate printer may have rubbed the ink into the crevices with his fingers,[506] a practice still preferred by some printers because of the direct contact with the plate – they can immediately detect whether there are any hard particles in the ink that may scratch the plate's surface. With mezzotint, drypoint or aquatint plates, inking by hand reduces the chances of wear of the sensitive textures of these plates.[507]

The plate printer in the backroom in Stradanus's printshop interior (see Fig. 222) is using a roll of cloth for inking, known in English as a 'dabber' or 'dauber'. Bosse explains how to make a *tampon* by rolling a strip of linen stiffly, sewing it tightly with needle and thread stabbed through the roll and cutting the edges of the lower end.[508] The plate printer holds the roll in his fist, moving the bottom end of the roll over the plate in a turning motion described by Bosse as *coulant, pressant* and *tappant*. Circular scratches in the print are due to hard, gritty material in the ink damaging the plate's surface in inking.[509]

Printing balls of the kind used in relief printing are also found: they spread the ink over the plate in a rocking motion. Brayers for inking printing type were introduced in France in 1810 and in England shortly afterwards.[510] Initially replacements for printing balls, they were later used in inking intaglio plates.[511] Modern printers spread the ink with a brayer or a piece of card or rubber ('squeegee'), scrape off excess ink and further rub the ink into the grooves.[512]

Wiping

Inking is followed by 'wiping', the most crucial part of the printing process. The ink has to be removed from the surface of the plate in such a manner that enough ink is left in the grooves to completely render the image. Ease of wiping is related to the metal of the printing plate. As a rule of thumb, the softer the metal the more the ink sticks to its surface. In order from the most difficult to the easiest to wipe are tin, zinc, copper, steel, steelfaced and chromefaced plates.[513]

William Humphreys, who had played a role at the beginning of steel engraving in the 1820s, attended the meeting in 1858 during which Jean Ferdinand Joubert presented steelfaced copper plates.[514] Humphreys remarked that steelfaced plates could probably be cleaned more easily than copper plates. He also 'recollected the difficulties experienced in the early stages of steelplate printing on that account, but by the adoption of a suitable ink, the one description of plate was now worked as easily as the other'.[515] He might have meant that the mutual proportions of thinner and thicker oil varnish changed towards thinner ink, which wipes more easily.

The plate's surface is cleaned by lightly rubbing a 'rag' over its surface. Earlier sources speak about linen cloths.[516] Sources from the later nineteenth century commonly mention gauze, a cloth with an open weave. This material may have been introduced for plate wiping in the eighteenth century because Laurie (1776) mentioned 'coarse gauze canvas'.[517] Goulding (1910) believed that French plate printers had replaced linen cloths with crinoline by the mid-nineteenth century.[518] Nowadays 'tarlatan' or 'cheesecloth', called bookbinder's gauze, is used.

Cold and warm wiping

Wiping can be done warm or cold, ie with or without heating the plate during inking and wiping. With thin ink, the plate is inked and wiped without heating at room temperature. This is suitable for plates with superficial structures such as finely engraved and briefly etched grooves. In a letter from Giovan Battista Mantovano (Scultori) to Cardinal Antonio Perrenot di Granvelle of 31 December 1547, Mantovano refers both to an ink that is wiped warm and to one that is wiped cold.[519] He had asked the cardinal for the ink recipe used in Germany for wiping plates cold because he claimed that Albrecht Dürer used it. The effect of the combination of thin ink and wiping cold is an impression of high contrast because little plate tone will be left. The drawback of thin ink is that the oil varnish seeps away rather quickly into the paper, staining the impression over time and counteracting the desired contrast.

A typical example is the difference between the etchings by Hercules Segers printed in black only and in colour. The black ink sits on top of the paper, which is still white. The papers printed with coloured inks, however, have all yellowed, having been soaked with the oil of the thin ink almost as if Segers had used plain oil paint.[520] Modern inks for printing polymer films and solarplates use thin inks prepared with soybean not linseed oil varnish and are wiped cold. Their shallow grooves contain only a little ink and in combination with a thicker paper the bleeding is barely visible.[521]

Judging from illustrations of historical printshop interiors, most plate printers seem to have wiped plates warm. A stove with live charcoal with a grill above is commonly seen (Fig. 254). The plate is warmed and inked on the grill, and wiped next to it.[522] Stiffer ink, made with a more viscous oil varnish, is used when wiping warm. The thicker medium is better suited for deeper cut or etched grooves, sinks less into the paper and leaves a shinier line. Using a stove with live charcoal continued until well into the nineteenth century, when steam and gas heaters were introduced in England and France.[523] The first electric hotplates appeared around 1900, but gas heaters were still found throughout the twentieth century.[524]

Dry and wet wiping

As well as dry wiping there is wet wiping. In both cases a folded cloth is first wiped over the inked plate until most of the ink has been removed. In dry wiping, the printer continues moving the thicker part of the hand underneath the little finger over the plate; sometimes the thicker part of the hand underneath the thumb is also used.[525] The last traces of plate tone can be removed with some whiting (finely powdered chalk).[526] The hand is rubbed with the powder and wiped lightly over the plate once more. Whiting has two functions: first as a mild abrasive and secondly to absorb oil. Other, less abrasive powders mentioned for wiping include alum, rice powder, fine shavings of chamois leather and jeweller's rouge.[527] They are used to wipe the finest structures where whiting would be too coarse.

In wet wiping, following the first wiping with a folded cloth, another cloth dampened with a solution of diluted lye, ammonia or stale urine is wiped over the plate (see Fig. 254). The liquid saponifies the oil varnish in the ink making it water-soluble. The texture of the wet cloth picks up the rest from the plate surface.[528] Wet wiping can be performed well on copper because the semi-precious metal does not react with the alkaline fluid. Other metals, such as zinc or

iron, are corroded by it.

Wet wiping is a reasonably straightforward method of cleaning because no ink residue is left on the plate's surface when done properly.[529] The lines print black against the white of the paper and the greatest contrast is achieved. Occasionally streaks from the damp cloth can be observed showing that this kind of wiping was used for faster working when less sensitivity was needed. As Dossie (1758) stated, it is applied to 'pieces of architecture and other works that do not require so much nicety in the treatment as portraits'.[530] The majority of plates were probably wiped wet from the sixteenth century onwards for reasons of speed.[531]

Plate tone

More expression can be achieved by dry wiping and finishing by hand. Sensitive plate textures, such as mezzotint or aquatint, do not allow for wet wiping: mezzotint because too much ink would be left on the plate and the whole would become messy, and aquatint because the shallow ink layer left would be removed completely. Wiping by hand allows the plate tone to be left or removed more delicately. Examples of extra plate tone can be found throughout the history of intaglio printing. Usually it can be observed that wiping was not completed, in other words the plate's surface was not clean enough (see Fig. 33, p. 33). This is not the same as deliberately leaving some ink as part of the image (discussed below).

The *Theatrum instrumentorum et machinarum* by Jacques Besson, engineer to François I, is a series of etched designs for tools, musical instruments and machines. It was well known in its time and published with accompanying texts in Latin, French, Italian and German. Plate VI of the Italian-language edition (Lyon 1582) shows an extra film of ink left on the lower, shaded sides of the tubes depicted, probably to give them an extra impression of volume (Fig. 255).[532] The same can be observed in Plate 6 of the German-language edition (Mümbelgart 1595). This displays a transfer of technical information because someone else created the same effect in the same plate 13 years later, unless the same printer printed these plates once more.

Famous are a number of early states of etchings and drypoints by Rembrandt van Rijn, such as the *Three Crosses* (see Figs 210 and 260) in which the plate tone was left to create theatrical lighting,[533] effects similar to the way mezzotints would be burnished and printed a few decades later. Less dramatic is the manipulation of ink in his drypoint landscapes (see Fig. 127, p. 153), the *Ecce Homo* (see Fig. 259) and some interiors, although they still show the typical velvety effect of drypoint.

Rembrandt's use of plate tone was first discussed by Adam von Bartsch in his oeuvre catalogue of Rembrandt etchings.[534] Being an experienced engraver himself, although not a professional plate printer, Bartsch recognised that the tonal effects were not due to mezzotint or aquatint, as some before him had argued. He even went as far as to reconstruct the working manner and printed (himself?) a plate of his own with a manipulated heavy plate tone to create a night scene. Bartsch would have liked to have illustrated his book with impressions with plate tone but found it impossible to leave this task to a 'common printer' (*un simple imprimeur*).[535] He was clearly implying that the average plate printer could never have achieved the plate tone in a number of Rembrandt's prints therefore the artist must have wiped the plates with his own hands, leaving and removing ink at will. Alternatively, Rembrandt may have supervised and instructed the printer as to how the inking, wiping and printing should be carried out.

The deliberate use of plate tone came into practice with the painter-etchers of the second half of the nineteenth century (see Fig. 200). The English etchers considered that they should do their own printing, or at least the proofing, one of their reasons being that they should control the complete process, or, as Francis Seymour Haden (1866) commented: 'If the artist cannot print his own works he should choose a finely-organized man with the palm of a duchess to do it for him.'[536] Hamerton (1881) therefore advises that 'the student should learn printing from a copper-plate printer in one or two lessons, though such printers know only "simple" printing'.[537] He, like Bartsch and in similar terms, expresses the opinion that the professional printer just practised straightforward wiping, the impression showing the lines in the plate only and nothing more.

Considering the vogue for immaculately printed steel engravings that had just passed, Hamerton's words express the change in views about the appearance of the intaglio print at that time. Ludovic-Napoléon Lepic was the ultimate practitioner of the art of that period – he excelled at producing series of different impressions of the same plate, working plate tone in the manner of monotype. As he stated: 'I am master of my plate and cloth.'[538]

Also in 1881, *The Printing Times and Lithographer* referred to the firm of Bradbury & Wilkinson who operated a machine that could produce 1,500 visiting cards per hour, printing black lines against a stark white background.[539] This expresses the difference between the artistic approach of the painter-etcher towards printing versus the rationalisation that was taking place in the printing industry.

Retroussage

Later nineteenth-century printmakers used the qualities of the gauze for a particular technique called *retroussage*. After wiping the plate is warmed once more and a loosely folded piece of muslin rubbed lightly over the plate to drag some ink from the grooves. The open weave and light weight of this cloth further manipulates plate tone by this ac-

tion.[540] This has the effect of softening the edges of the lines making them seem a little more voluminous and unifying the lines of hatchings. The whole impression is given a fuller, warmer appearance (Figs 256 and 257).

The revised opinions on wiping and the consequent appearance of the print led to discussions in favour of, as well as against, plate tone and *retroussage*. Potémont showed an example of deliberately manipulated plate tone in his *Lettre* (1864), explaining that it was the workman who introduced the shades (plate tone) with the printing ink following a washed first proof he had given the printer as example.[541] Actual *retroussage* was probably invented by Auguste Delâtre in the early 1860s in his search for new printing techniques. Lalanne (1866) lets Delâtre guide the reader through his printing practices.[542] First he describes 'natural' printing (*épreuve naturelle*, ie without plate tone) followed by an explanation of the methods of *retroussage*.[543] Beraldi (1886) discerns seven forms of wiping – from absolutely clean to heavily worked by *retroussage*.[544]

Haden made a statement opposing any plate tone at all in the same year. He argued that the plate printer should wipe the plate clean so that the lines in the plate would stand out against a clean background.[545] Nevertheless, Goulding, who always used plate tone, printed all of Haden's plates apparently to his satisfaction.[546] Whistler, Haden's brother-in-law, printed his etchings of Venice himself because he needed the atmospheric effects, reflections and shades created by the plate tone.[547] *Retroussage* was considered a benefit by C.O. Murray: 'the effect is the fullness and breadth of tone, and the absence of *grin*'. He remarked on the hard, insensitive contrast between the white of the paper and the black of the ink when the plate surface is wiped absolutely clean, commenting on a critic who considered *retroussage* 'an illegitimate practice'.[548]

Hamerton was negative about any 'artificial printing' in the first edition (1871) of his manual: the proof should merely show the way the plate is etched. In the third edition (1881) he took a more nuanced position, describing the differences between 'simple' or 'natural', and 'artificial' or 'artistic' printing. In the first case the plate is wiped by cloth and then by hand with whiting; these proofs are hard and cold, resembling a visiting card (Murray's '*grin*'). 'In "artistic" printing the plate is treated in various ways so as to help its expression and add to its charm.'[549] A factor that should also be considered is that technical and chemical progress in the course of the nineteenth century had made possible the production of a very white paper. This suited the immaculate printing of steel engravings, blue toner being added to the black ink to further enhance the contrast; exactly the '*grin*' Murray reacted against.[550] The handmade paper of earlier days had a cream tone, which in time could degrade and turn yellowish to brown. This was the old paper favoured by Whistler and his followers, who also advocated adding brown toners to give the black ink a warmer cast; plate tone went well with it.[551]

Koehler (1885, 1897) added to the discussion when he wondered why *retroussage* was not practised by sixteenth-century plate printers.[552] The historical-technical answer is that *retroussage* followed the introduction of gauze with an open mesh (tarlatan) for wiping plates in the mid-nineteenth century, instead of smoother linen rags.[553] The gauze could pick up more ink in wiping, but also allowed the light touch needed in *retroussage*. The historical-emotional answer is that Koehler was a child of his time. He was a herald and advocate of the modern Etching Revival, promoting etchings by American artists as editor of the American Art Review (1880–1881), having published an annotated translation of Lalanne's treatise in English in 1880 and a handbook on etching processes in 1885.[554]

Sixteenth-century prints may show plate tone ranging from accidental smudges to ink left intentionally, what Koehler calls 'tinting'. He did not recognise the particular kind of ink manipulation of his contemporaries, dragging ink from the grooves after wiping was finished.[555] Neither is *retroussage* mentioned by an authority on intaglio printing, such as Berthiaud (1837), active just before the Etching Revival.[556] On the contrary, Berthiaud emphasised that the printer should reproduce what is on the plate and *retroussage* conflicts with that practice.

The present study demonstrates several cases of antecedents of later established techniques in which corresponding elements are observed, but the processes are never identical. The technique of *retroussage* is performed by raising ink from the grooves with a fine muslin cloth with the deliberate aim of creating a print with a 'warm' appearance. It is related to ideas about the aesthetics of artist-etchers of the second half of the nineteenth century and the work of dedicated contemporaneous plate printers, if not invented by August Delâtre himself.[557] Altogether this is too specific to assume that ink left on a sixteenth-century plate, even if left deliberately, could be termed *retroussage* as understood by a nineteenth-century artist-etcher.[558]

Modern developments
The discussion on whether or not to leave plate tone and use *retroussage* rumbled on for decades especially among English printmakers.[559] And, although the technique is now rarely used, the debate continued throughout the twentieth century with echoes until the present.[560]

An exponent of the counter movement was a small group around the Rotterdam printmakers Johannes Proost and Andreas Schotel. Active from the late 1920s they pushed the idea of a plate wiped perfectly clean to the extreme. In contrast to the English artist-etchers from the nineteenth century who preferred the then browned papers and inks of their protagonists, this Rotterdam group observed that seventeenth-century prints showed crisp black lines on blank paper. Not satisfied with the available commercial printing ink, they produced their own printing ink from charred

wine lees and burnt linseed oil using Bosse's manual as their guide.[561] Wiping was performed by passing paper from a roll over the plate's surface in a kind of hand-operated machine named 'Mari', until the plate was immaculate.[562] The intention was to create a 'clean-printed etching' (*schoongedrukte ets*), with deep black lines on bright white paper with no plate tone at all, the very antithesis of Murray's argumentation.[563]

Printmakers started printing their plates almost spotlessly from around 1970 onwards as a sort of (unintentional) counter movement.[564] Following a first wiping with tarlatan or pieces of newspaper, pages from telephone books and tissue paper were used for further wiping until the plate's surface was clean. This was often combined with a final rub by hand with some whiting.[565] The cleanly wiped plate is the most common seen nowadays.

Printing by press

Once the plate had been wiped the edges were cleaned using a piece of cloth, sometimes with some whiting or moistened with a drop of turpentine. The plate was put on the maculature on the bed of the press and some dampened paper from the pile positioned on top. Another sheet of (damp) maculature or thin tissue paper was added, the whole was covered with the felts and this sandwich then run through the press. The printer turned the cross of the press, the rollers moved and the bed of the press passed between the rollers. As there was so little space left between the top roller and the bed of the press, the felt was strongly compressed, tried to expand again but could only do so into the grooves of the plate. In between was the printing paper, which was forced into the crevices filled with ink, the ink slightly penetrated the fibres of the paper and thus the impression was made. Moved to the other side of the press, the blankets were flung back again, the soft, damp paper carefully lifted to avoid tears and rubbing the fresh print thereby spoiling the impression. The fresh impressions were first piled up on a table next to the press and later hung to dry over ropes or laths. Nowadays fresh prints are laid to dry in a rack or hung to dry using pegs or similar systems.

Offset

There is a good chance that piled-up fresh impressions will offset. A blank 'spacer sheet' can be placed on top of a fresh print before the next impression is placed on the pile in order to prevent offsetting. References to spacer sheets are not found before 1805, which means they were probably introduced shortly before.[566] Another kind of offset is particular to bound print series and book illustrations. After a week or longer the intaglio ink may be dry to the touch, but ink will still offset when under pressure, such as during the binding process.[567] An extra sheet of thin paper may be bound in front of the illustration in the more expensive kind of books in order to prevent the illustration offsetting and staining the text, a habit that developed in the eighteenth century.[568] It is also possible to coat the print – Perkins printed his banknotes on 'water leaf' (unsized) paper after which they were sized to prevent the ink from offsetting.[569]

States

A trial proof is made when the plate is run through the press for the first time. The printmaker decides how to continue on the basis of this impression, working the plate further and proofing it in between. These proofs are referred to as 'states' (Fig. 258). Consequently a series of states reveals the production manner and progress of a print.[570] States, which had already appeared in the fifteenth century, are well known throughout the history of printmaking.[571] Once the proofs are ready and the definite state of a plate has been reached, a 'good for printing' (*bon à tirer*) is given and the edition printed.

By 1630 Anthony van Dyck had started to design a series of portraits of contemporary artists and officials – later known as the *Iconographia* – that was produced by the best Antwerp engravers. Van Dyck is supposed to have etched the first states of 16 plates of the series.[572] He drew the head of the sitter in detail with some rudimentary lines sketched around it to give a little more volume to the portrait, but commonly left the larger part of the plate untouched. The plate was etched and proofed, producing the first state. In some cases Van Dyck slightly reworked the plate and proofed it again for a second state. Then he passed the plates to professional engravers who took care to fill the plates up to their four edges with lines, as was customary, for the trade edition. Allowing for some losses and that not all existing copies of Van Dyck's etchings are represented, a clear picture emerges. The counts of the first and sometimes second states of these 16 plates confirm that they survived in editions from 20 to a maximum of 28.[573] Five out of 16 are known in 28 copies and given the other high numbers, the edition ordered by Van Dyck of his etching would also have been that high (Table 5).

This makes one wonder whether perhaps Van Dyck deliberately produced these first states with a small group of print connoisseurs in mind.[574] The stark design of just the sitter's head in a print was modern for his time, especially when compared to the baroque way of painting of his master Pieter Paul Rubens.[575] Conspicuous also is the number of impressions – to pull more than twenty proofs from a plate before the actual trade edition was printed represented a considerable financial investment and the question remains as to what he did with so many proofs. Normally just one or a few impressions would suffice to determine how the plate was progressing and to sketch corrections on

them, as can be seen with the other portraits in the series, until the plate was ready for editing. There would have been no need to pull so many proofs of a first state unless there was a market for them. Van Dyck may have ordered a larger number of impressions – a 'special limited edition' – from the plate printer once he was satisfied with the plate's appearance, after which the plate was passed to a professional engraver to cut the trade edition.

His younger contemporary Rembrandt used the phenomenon of states to the full, changing and adding to the initial design himself, in some cases almost to the point of completely reworking the plate (see Figs 210 and 260). This would have been to satisfy his curiosity regarding the possibilities offered by the design. But he also seems to have produced variations of his etchings and drypoints deliberately to exploit the curiosity of avid collectors of his works.[576]

While states are supposed to show the working progress of the plate, choosing different papers in different structures, hues and colours, as well as printing on parchment, textile or other supports is also typical for printmaking. Next is the choice of ink, its viscosity, transparency, hue and colour.

Leaving more or less plate tone has already been referred to as a method used by Rembrandt to enhance the possibilities offered by the etching medium.[577] Nineteenth-century plate printer Auguste Delâtre took this technique further with the development of *retroussage*. With Lepic's series of monotypes based on one etching plate, the limit of the edition of a 'state' is reached. Whereas Delâtre's manipulation of the ink allowed the etcher to choose a definite state from proofs, every one of Lepic's proofs should be seen as an original.

Double run

The practice of a 'double run' – passing the plate and paper through the press back and forth before lifting the blankets and paper – is occasionally mentioned from the eighteenth century onwards.[578] It must have been a relatively common procedure given the typical doubling of lines that is created by it and which is already found in the sixteenth century (Fig. 259).[579] The idea is to strengthen thinly cut or briefly etched lines in the impression. The paper expands slightly when passing underneath the roller and will do so a little more when run back again. The ink that is left in the grooves after the first impression is pulled, prints on top and next to the already printed line. This printed line will expand, resulting in a slightly thicker and darker line.

This may be successful provided the paper only expands by a small amount and does not move, or when the plate is only the size of a hand or smaller. With larger plates, expansion of the paper may be so great that a noticeable gap appears between the first and the second impression, creating a double line.[580] The doubling is progressive – the farther away from the turning point of the first impression, the larger the distances between the first and the second impression.[581]

Another phenomenon related to a double run is the shifting of the paper. Usually the paper sticks to the plate after one run. If one corner is lifted in order to see what the impression looks like and placed back to pass it through the press once more, air introduced between the plate and paper may result in some movement of the paper. Most, if not all lines will appear doubled after the second run. More serious movements will result from the paper being lifted completely from the plate and placed back again.

Stretching of the paper sheet is the main problem in *au repérage* colour printing, a method for printing several plates on top of each other on the same area of one sheet of paper. It is the cause of colour fields not printing in register and consequently for the development of techniques to solve the problem, which will be discussed below.

Counterproof

The 'counterproof' is a special kind of print.[582] The plate is printed, the fresh impression placed face up on the bed of the press, covered with another sheet of paper and the whole run through the press.[583] The wet ink of the impression offsets onto the blank paper producing a reverse proof in the same direction as the design on the plate (Figs 260 and 261). A counterproof does not carry an embossed platemark. Some remains of ink left at the plate's edges may offset, however, which may look like real plate edges. If the grooves of the original plate are thin and shallow, its impression will have only weak lines. The offsets on the counterproof are paler than in the print and lack contrast. When the ink lines on the print are more voluminous, they may be flattened to produce heavier offsets with blurred hatchings. This is particularly visible in modern counterproofs of prints whose plates are often etched more deeply than historical plates.

Counterproofs are found from the sixteenth century on and appear regularly throughout history.[584] However, the sources reveal little about their functions and the questions related to them in art historical research. Seigneur (2004) gave a first overview and discussed their various uses: 'to elaborate a composition; as a device to render a given model as accurately as possible; as a means to speed up the completion of the composition; or to keep a record of the design'.[585] Further examples include experiments with the design (Hercules Segers), to create new works of art (Experiens Sillemans), or to satisfy an inquisitive audience by supplying a counterproof of a print, the subject of which was published in reverse of the reproduced original.[586]

Counterproofs are useful for architectural and ornamental designs with two mirror-image halves – only one side of the design needs to be engraved and printed, the other half can be counterproofed and the two pasted together.[587]

For example, to reproduce the lost part of the Colosseum in Rome, two prints can be counterproofed, prints and counterproofs cut in half, and both the constructed and the open halves pasted together to show the full building from the outside as well as the inside.[588] A counterproof can also be used as a basis for a drawing or a watercolour painting.[589]

Fresh impressions can be offset onto a second plate, either directly onto the copper for making an engraving or onto an etching ground, such as for replicating a printing plate to extend the edition of a particular design, or in *au repérage* printing to prepare the following plates.[590] It is also possible to regenerate old prints and to offset them by soaking the prints in diluted lye or soapsuds which saponify and soften the oily binding medium of the ink. When run through the press with another blank sheet, the lines of the old print also offset.[591] The technique can be used to replicate worn plates in order to extend the edition, or to produce new plates when the original one is not available or no longer exists.[592]

A typical example of counterproofs involves the plates for the Surinam book (1705) by Maria Sibylla Merian.[593] Merian was famous for the scientific accuracy of her works as well as the beauty of the prints hand-coloured by her and her daughters. Comparison of eight copies of the book shows that half of them are illustrated with impressions directly pulled from the plates, while the other half contains counterproofs.[594] The latter impressions appear somewhat grey, do not have embossed plate edges and the names of the engravers as well as the plate numbers are reversed. The logical conclusion is that counterproofs were made of all the prints pulled and used either a set of prints or a set of counterproofs to compile one volume.[595]

Again we come across the issue of reversing left and right in printed works.[596] Apparently, despite the accuracy of her work, Merian was not concerned as to whether a caterpillar or butterfly was depicted from the left or from the right. Her reasons have not been documented but it could be argued that as her natural subjects had almost perfect symmetry in any case, it did not matter which side was shown. The practical advantage was that by making counterproofs, two images could be pulled in almost the same time it took to make one impression for only the cost of an extra sheet of paper and without using extra ink, while the workmen could produce double the amount of prints in nearly the same time. Additional time would be spent on the extra run and drying the extra sheet, but only half the amount of ink would need to be ground. Producing the book must have been expensive, with its many larger copper plates and the number of editions to be pulled. However, by using counterproofs Merian could at least save on labour costs.[597]

Blind embossment

It has been argued above that ink is indispensable because it contrasts with the surface upon which is printed; it is the application of ink on the support that makes the design visible.[598] Other ways to create such a contrast have been sought, such as cutting out shapes from the support or embossing a relief into the paper. With the latter, called blind embossment, raking light causes the relief to throw a contrasting shadow, making the image or text visible. In mediaeval book printing (*incunabula*), uninked type and woodcuts were used to support blank pages when printing a full sheet to prevent them from falling and becoming soiled.[599] It was not intended to create an uninked text or image, however.[600]

An earlier technique used to clean an intaglio plate involved cleaning the plate with a cloth dipped in some olive oil and running the plate with a sheet of paper through the press to remove the last traces of ink from the grooves.[601] Some of those sheets were left and once the grooves were fully clean, little more than the lines rising above the paper surface were visible.[602]

Deliberate blind embossment can be seen in some prints by Hercules Segers, who pressed a textile structure in a few of his etchings.[603] Intaglio printing combined with an uninked relief is found in a group of twelve prints after Italian drawings produced by Elisha Kirkall between 1722 and 1724. The relief was made by cutting out parts of a second printing plate.[604] This was incidental however – neither Segers nor Kirkall printed an uninked engraving or an etching for its relief only.

Printing the uninked plate leaves the design embossed in the paper. Occasionally only part of the print was inked; the other, uninked lines were embossed only.[605] Another way is to cover the non-printed areas with a piece of paper thereby leaving an embossment of the covering piece of paper.[606] Blind embossment is not observed in intaglio printing nor is it documented.[607] The technique only became common in modern printmaking, instructions being found widely from the 1970s on (Fig. 262).[608]

Chine collé

A typical nineteenth-century extension of the possibilities offered by intaglio printing is *chine collé* printing, also found with lithography.[609] The printing plate is inked, wiped, placed on the bed of the press and covered with a sheet of thin, briefly dampened oriental paper a little smaller than the plate format.[610] Next a sheet of damp thicker (European) paper is placed on top and the sandwich run through the press. The thinner sheet picks up the ink in the printing and bonds together with the thicker backing paper, while the latter gives volume and opacity to the thinner paper. The method is sometimes reversed in modern printmaking: first the plate is printed on the backing paper, a blank plate of

the same size replaces the printing plate, thin paper is placed on top, the print is placed face down on top and the whole run through the press. Now the image is covered by the thinner paper, which changes the tone of the ink.[611]

The two papers should adhere to each other – the fibres of both gripping together – but an extra brushing of each side just before printing will facilitate the bonding.[612] Usually the back of the *chine* is brushed with a thin sizing made up of a starch paste just before printing.[613] There are a number of variations of the technique: the papers may be prepared in advance, dried, and moistened ready to print;[614] oriental paper may be dusted with dry flour powder while lying on the plate, or even in advance, the water in the damp thicker paper being enough to activate the starch, causing the two to stick together.[615]

The technique is quite demanding of the skills of the printer, the complicating factor being that the expansion, stretch and shrinkage properties of the two papers will differ. The accompanying tension may give a beautiful result but may also cause air bubbles to form beneath the *chine* or release it from the thicker paper.[616] However, the thinner paper can pick up more detail from the plate, while the structure, hue or colour of this paper may add to the appearance of the final print. This technique was especially appreciated for the printing of steel engravings, the smooth oriental paper picking up the finest details of the plate (see Fig. 5, p. 6, Fig. 113, p. 139 and Fig. 202, p. 224).[617]

Paper for *chine collé* printing became available with the regular import of oriental, mainly Chinese, paper into Europe from the middle of the eighteenth century.[618] Some English prints of the 1770s and the 1790s were printed on oriental paper pasted onto European paper.[619] Whether this was achieved in one run, as with *chine collé* printing, or whether the impressions were pasted to European papers afterwards cannot be established, but the idea was already there. Perhaps the first true example of *chine collé* printing dates from 1805.[620] Berthiaud described *chine collé* printing in 1837,[621] at which time the technique was very popular. *Chine collé* printing largely disappeared with the decline of steel engraving after the middle of the century and was only practised by some professional workshops.[622] One could speculate as to why it was so rarely used for printing photogravures as *chine collé* would enhance the qualities of their fine structures and tones. The artist-etchers of that period were interested in printing their etchings on Japanese paper,[623] but they do not seem to have practised *chine collé* printing either, possibly because the technique would have been beyond their technical capabilities.

Western manuals of the second half of the twentieth century commonly discuss placing pieces of pasted coloured paper on the printing plate and running them through the press together with the printing paper.[624] Detailed descriptions of printing on full-size *chine* papers of the formats of the printing plates are largely missing, probably because the technique was used more by professional printshops than printmakers.[625] The teaching of the method is standard in Japanese printmaking courses and therefore often found with modern Japanese prints of the past decades.[626] These courses have supported the reintroduction of the technique in Europe and North America since the mid-1990s[627] and instructions for *chine collé* have appeared regularly since the year 2000.[628]

Instead of thin Japanese paper, nowadays a variety of other materials is found *collé'd* with the impression or collaged to the print in an extra run. Lead, silver, gold and plastic foils are observed.[629]

Drying of the print

The blank margins of the print will remain clean provided the assistant, such as an apprentice who carries out the printing, has clean hands. This is also a requirement if the person who wipes the plate also does the printing, for which Bosse recommends using a cloth to clean his fingers.[630] However, this is not a practical solution as ink is notoriously difficult to remove from skin. Printers therefore use pinchers or paper fingers, strips of double folded paper, to avoid soiling the sheet.[631] One half of a pincher is moved underneath one short side of the paper and the print lifted, and the other pincher is used to hold the other short side.[632] The impression is lifted from the plate and the drying process starts. A few hours are allowed for evaporation of water from the paper but the drying of the ink takes a couple of days to a few weeks, depending on the thickness of the ink layer and its particular composition.

Ideally, in a seventeenth-century workshop in which the press was used almost continuously with only short time intervals between the runs, two tables would be placed on opposite sides of the press and the freshly pulled prints piled up on both tables. As mentioned above, however, this is one of the causes for the offsetting of ink from one fresh impression onto another, which can be found regularly.[633] The sheets would then be removed from the pile and hung across ropes or laths to dry, which sometimes ran along the wall (Fig. 263, see also Fig. 225), but usually beneath the ceiling (see Fig. 11 (right), p. 12, Fig. 68, p. 80, Fig. 91, p. 102 and Fig. 242 above). In modern drying systems, the fresh prints are hung to dry using pegs or more sophisticated kinds of clasps. Sheets too small to hang over cords are dried on a table or on the floor (see Fig. 78, p. 92).[634] Leaving prints to dry on a flat surface takes up a lot of space, but has the advantage that the cords do not crease the paper and is therefore occasionally used for more precious works.[635] Drying racks became common in the twentieth century (Fig. 264).

Hanging or laying prints flat has the disadvantage that the paper will buckle in drying, and the sheets have to be flattened afterwards. When thoroughly dry the sheets are stacked in a pile to flatten under their own weight. They may also be placed between weighted boards or in a vertical press.[636] Both the creasing due to the cord and the buckling of the paper are removed by placing the pile of prints under pressure in such a press.[637] This is a time-consuming

process therefore by 1800 plate printers started to use 'blotters'.[638] Blotters are thick unsized sheets of paperboard that absorb water from the printing paper to speed up drying and thereby the production process. Once the paper is dry the prints become flat.

At the beginning of the drying process the blotters are replaced every hour, allowing the paper to dry reasonably quickly. This method also increases the speed at which the oil varnish seeps from the ink into the paper, giving the impression that the ink is drying faster. The drying time of the ink does not change however – it is simply that very little oil varnish remains on the surface of the paper. Blotters can be used for thinner layers of ink, but the method is not well suited to deeply embossed lines with thick layers of ink as the ink will offset dramatically and the embossed lines will be flattened, quite the opposite of the relief that is intended. However, blotters work well for aquatint and thinly etched lines, but not for heavy drypoints and mezzotints, which will lose colour intensity and texture, or heavily inked and embossed proofs.

Instead of using blotters the print may be stretched directly after drying by placing the sheet on a board and fastening it all round with dampened gummed tape.[639] This ensures that the paper is perfectly taut the next day. The same may be done with already dried but buckled paper.[640] The tape is torn off dry, which leaves rough surface marks, but this can be avoided by turning the damp print upside down so that the tear marks are on the back. Parchment may be dried the same way, but before the invention of gummed tape the parchment was perhaps pinned onto a board. The print has to be cut within the pinholes after drying.

Cleaning of the plate

Printing plates were cleaned with olive oil after engraving or etching as well as after printing, until long into the nineteenth century.[641] This oil, probably cheap and readily available, does not dry and can be used for cleaning because it acts as a plasticiser, making it easy to remove the now liquid mixture of wax or ink with oil.

When etching has finished a plate covered with an oil ground (*vernis dur*) is heated until the stopping-out varnish softens sufficiently to be removed from the back and the front of the plate by vigorous rubbing. Next the hard ground is polished off with charcoal and water, stains are removed by rubbing with a cloth and some diluted nitric acid, a piece of cloth coated in some olive oil is passed over the plate, and finally a linen cloth until the plate is completely clean.[642] A wax ground (*vernis mol*) is removed by warming the plate and rubbing with oil and a cloth.[643] With engraving an oiled cloth is passed over the plate to clean off any dirt, while the plate is checked for remnants of copper to avoid scratching its surface. This is followed by rubbing with a dry cloth with some turpentine to clean the oil from the plate.[644]

When printing is ready the plate can be run through the press once more without re-inking it, drawing the remainder of the ink from the grooves (Fig. 265). A more thorough method involves rubbing the plate with some oil, wiping this off with a cloth, and rolling breadcrumbs or leather shavings over the plate to further clean its surface. Finally the plate is run through the press to remove any remaining ink from the grooves.[645] The 'ink' on such 'maculature' impressions is a mix of what is left of the normal printing ink and the oil used for cleaning. It is therefore not of the best quality as proportionally there is too much oil in the ink. All this together may lead to blurred lines whereby the thinned ink is squeezed from the grooves, and to the bleeding of the thin, slow-drying oil from the ink-and-oil mixture. Maculature proofs can be recycled in printing, using their blank versos, by placing the sheets underneath the plate or on top of the damp printing paper.

The originally pale-coloured oil on this maculature will turn brown over time but sometimes, when the impression is good enough, maculature is given a life of its own. To later owners, unaware of the cleaning process, the print may look as if printed in a pale grey when there was still some ink in the grooves.[646] If the print appears in a lighter shade of brown then only the oil left after cleaning was printed. The maculature exhibits paper fibres coloured by browned oil when viewed under the microscope and any ink deposit is virtually absent.[647]

Solvents for cleaning

Apart from vegetable oil, diluted lye or a soap made with lye is also used in cleaning, particularly for the removal of dried ink from the grooves in copper plates.[648] It saponifies the oil varnish after which it can be easily washed off with water. Dissolving a hard (oil) ground in a lye would also be possible, but is not mentioned in the sources. Lye can be used on the semi-precious copper, but not on zinc or steel with which it reacts quickly.

Turpentine oil distilled from pine tree balm came into more general use for cleaning printing plates shortly before 1800.[649] Its use is mentioned regularly in the nineteenth century, sometimes in combination with chloroform or an alcohol.[650] Solvents distilled from mineral oil gradually replaced vegetable solvents after 1860. Petroleum, or naphtha, a liquid and fugitive product from mineral oil, was known in antiquity. It was found mainly in natural sources in the Middle East and in some places in southern Europe, but its use was limited.[651] The solid bitumen, or asphaltum, was known in mediaeval and pre-modern western Europe through classical literature.[652] Petroleum, or even better, a crude distillate known as 'naphtha' was produced, but is rarely found in the following centuries, only supplied by apothecaries and not on a large scale.[653] European interest in mineral oil and its products was stimulated by the dis-

covery of rock asphaltum in the Alps in the eighteenth century.[654]

This means that petroleum was not available to engravers and printers for cleaning purposes before the second half of the nineteenth century. Turpentine oil was smuggled from North Carolina during the American Civil War (1861–1865). This raised the price of the oil and therefore a substitute was sought in 'naphtha of petroleum', a product of the developing petroleum industry.[655] It was found that petroleum served many purposes and proved even better than turpentine oil for cleaning.[656] Its main advantages are that mineral solvents are fugitive, it is not as fatty as turpentine oil and it is less expensive. This seems to have been the start of the use of 'petroleum essence' made from mineral oil in cleaning book printing type.[657] The cleaning of intaglio plates with mineral solvents is reported soon after.[658]

The reverse sides of etching plates were covered with a stopping-out varnish made of tallow or etching ground in oil until the nineteenth century. Heating the plate and rubbing the back with olive oil would have been sufficient to clean off the stopping-out, but no reference to this is found. Another kind is a painter's varnish, made of resin dissolved in turpentine. Heating the plate and rubbing with an oily cloth can remove stopping grounds containing greasy matter but resin varnishes require washing with turpentine.[659] Shellac varnishes used for stopping-out appeared in the nineteenth century and were cleaned off with alcohol.[660]

It was only slowly recognised that volatile solvents caused serious health problems to those inhaling their vapours. By the mid-1990s in all areas of printing and printmaking, industrial as well as artistic, less toxic alternatives for the volatile organic solvents were sought.[661] The solvents used are known as 'turpenoids', such as the highly volatile xylene, toluene and benzene, but also the less volatile white spirit, gasoline and turpentine. As they dissolve fat, oil, resin, asphaltum and wax, they are useful for dissolving etching ground and printing ink, however, they are detrimental to the human brain and nervous system.[662]

Turpenoids with a higher boiling point (high-boiling solvents) reduce the problem with occasional use but chronic or prolonged exposure to their vapours will still cause a health hazard. The best solution is to tackle the problem at the source, so cleaning of plates with vegetable oil again became part of workshop practice.[663] As an alternative, non-volatile esters of a vegetable oil and an alcohol were introduced.[664] So-called 'water-washable' printing inks that were introduced shortly after 2000 can be cleaned with water and detergent.[665]

Rubbing and casting

A variety of techniques is used to disclose the design in an intaglio plate without the aid of a press. Before the introduction of the roller press the back of the printing paper lying on the inked plate was rubbed to create an impression. Casting methods were used from the seventeenth century on – both methods are described in more detail below.

Several other processes have also been developed. An ingenious technique was invented for printing a rubber balloon in the nineteenth century. The insides of several parts constituting one globe were etched or engraved. These insides were inked and wiped, the parts joined and an empty rubber balloon inserted through the pole. The balloon was inflated and pressed into the inked grooves, creating an impression on the rubber. The same technique can also be applied to flat plates: a plate is put in a box, the box closed and a balloon inflated inside of it.[666]

Georg Schmidtke patented his technique of printing an etching plate with a metal hammer instead of a roller press in 1940.[667] The plate is placed in a special container with the inked and wiped side upwards. A sheet of dampened paper is placed on top of the plate, and a steel block with a plane bottom and a cone- or pyramid-shaped upper part with a blunted top is placed on the paper. The impression is made by hammering on the blunted top of the metal block, moving the block over the paper. The process was suitable for line and tonal intaglio.

A further possibility involves covering the inked plate with damp paper and tapping the back of the paper with a stiff, fine-haired brush. The impression shows a granular plate tone and lines due to the irregular structure of the tips of the hairs of the brush.

Rubbing

The technique of making an impression of an intaglio plate by means of rubbing seems simple: the plate is inked, the surface wiped, damp paper placed upon it, a thin sheet of felt can be put on top, and the whole covered with a sheet of paper.[668] The paper is coated with a lubricant such as fat or soap to allow it to be rubbed smooth with a burnisher, passing over the back of the plate, until the damp paper has been forced into all the grooves and the print is produced (Fig. 266).

Modern commercial intaglio inks are not really suitable for this method because their recipes are geared towards printing by press. These inks are too viscous and the pigments too fine to be effective in making an impression by rubbing; if it is attempted the prints will show coarse and granular lines because not enough ink can be pressed against the paper. Modern authors describing the rubbing technique therefore advise thinning the ink.[669] Reconstructions show that reasonable results are achieved with ink made of a thin oil varnish and a relatively coarse-grained black

pigment.

The next difficulty is the actual rubbing. The burnisher should be passed over the plate in total contact with its surface. The paper should remain motionless during the process, but characteristically prints made by rubbing exhibit double lines. Lines may double only partially, with the duplication visible in various directions.[670] When prints are pulled with a roller press, double lines will be one-directional.[671]

The reason for making a rubbing of a printing plate is the absence of a roller press. The technique has no particular attribute that makes the impression aesthetically more attractive. In other words, unlike printing by press, the possibilities offered by printing by rubbing are limited to the production of acceptable impressions and small editions.

Lalanne describes a variation of the rubbing method in 1866. Thin paper is covered with wax, lampblack (dry pigment, not ink) is rubbed into the grooves of the plate, the paper is folded around the plate and the back rubbed with a burnisher, the lampblack sticking to the wax easily.[672] Hamerton (1871) revealed that he 'not being clever enough' did not achieve good impressions with the method and later editions of his manual make no mention of the technique.[673]

In 2000–2001, Nik Semenoff developed the 'palm press', a hand gear comprising two series of ball bearings that are rolled over the printing paper covering the matrix (Fig. 267). The tool was developed for relief printing but it is also suitable for printing etchings and lithographic plates.[674]

Casting

Any extensive history on casting instead of printing of intaglio plates has yet to be written, but intaglio casting has always existed alongside intaglio printing.[675] The problem is not so much the lack of documentary sources on casting techniques, but more the absence of actual objects.[676] Few casts of printing plates – whether gelatin, sulphur, plaster, isinglass, wax or metal – have survived. However, any extant casts may have been classed as other materials more common to the printroom, such as parchment, when they are perhaps made of gelatin. They may have ended up in other departments – coloured casts placed in a frame behind glass may not be easily recognised as such. Alternatively, casts may simply not have been considered as prints.[677]

The reasons for casting instead of printing are diverse. First there is the technical issue: the plate may have been cast as an alternative to printing due to the absence of a press.[678] Casting in gelatin allows the translucent material to be placed against a windowpane or in front of a candle. The edible gelatin may also have been eaten (boiled with soup) or fed to animals for healing or religious purposes.[679]

Some sulphur casts of engraved plates from the second half of the fifteenth century remain.[680] Any contemporaneous descriptions on how they were made are not known. Vasari mentioned that he believed that sulphur casting was performed by pressing the plate in earth and making a cast of this.[681] Casting directly from the plate is recorded from the eighteenth century onwards.[682] To make a cast, the sulphur is heated until it melts, a rim is placed around the plate, and the liquid cast on the inked and wiped plate.[683] Sulphur casts can be made from copper and steel intaglio plates. Ziegler remarked that the colour of the cast is unpleasant – working with the molten sulphur is dangerous and the hot sulphur reacts with the copper turning the surface of the plate into a black mass of copper sulphide.[684]

A more efficient way is casting the intaglio plate in gypsum.[685] To make a cast, the plate is inked and wiped normally, just leaving a little more plate tone than usual because the plaster will stick more strongly to a cleanly wiped plate. The plate is placed on a flat surface and a rim of strong paper folded around the plate edges; alternatively blocks of wood are placed around the plate either adjacent or at some distance. The prepared plaster is poured on the plate to a layer of 1–1.5 cm thick, large plates requiring a thicker layer. Some coarse textile or wiring can be embedded to reinforce the cast. The gypsum is left to harden, a chemical process during which some ink is absorbed into the block, and the plate and its cast are separated. The white plaster's surface is as smooth as the plate's surface, disclosing the complete design. The contrast of the lines against the white of the plaster resembles an impression on paper in appearance.[686]

The technique is well suited to line work and coarse textures, but not for fine aquatint or mezzotint. Instead of black, any coloured ink may be used and the plate may also be inked *à la poupée*. The plaster cast can be cut, gouged and coloured. Several colouring layers painted on top of each other may be scraped off successively to create *sgrafitto* effects and objects may be placed on top of the plate to be cast together with it.[687] More plaster can be poured and modelled on top of the cast to create a relief. Several casts can be cemented together to create a larger surface or stacked to form a three-dimensional object (Fig. 268).

An early description of casting in gypsum is found in a manuscript by Constantijn Huygens of the mid-seventeenth century[688] in which he explains the basic working method and comments that inks of different colours may be used.[689] Casting plates in gypsum is often documented in the following centuries.[690] Plaster casts seem to have been used regularly by engravers to check on the progress of their works from then on.[691] Nevertheless, only a few actual casts of intaglio printing plates are known or recorded from before the twentieth century. In modern art, casting in plaster was practised by Hayter's Atelier 17 in Paris from about 1931.[692] Hayter's technical source was Koehler's English translation (1880) of Lalanne's treatise.[693] Hayter and his students elaborated the process further, paying special attention to carving and painting the cast.[694] From then on it was adopted and passed on to their pupils by those working in the

studio.[695]

The third material used for casting is isinglass, a kind of gelatinous glue made from fish bladders.[696] The glue is melted in water, poured on the inked and wiped plate around which a wax rim is built, and left to dry. The casts hold printing ink well and are translucent. The isinglass may be coloured with dyestuffs and mixed with gold and silver powder, while the casts can be hand-coloured. Prescriptions appeared in compilations of recipes from the late seventeenth century onwards.[697] Casting inked intaglio printing plates in isinglass began around 1640 and flourished to become a major industry especially in Augsburg around the middle of the century, with a production of 4,000 casts per week. Business fluctuated but continued until the nineteenth century and casts were exported to such far-flung places as Poland and Russia.[698] Other gelatinous materials are found from the second half of the nineteenth century and production was mechanised in the first half of the twentieth century.[699]

The Augsburg production figures reveal that millions of religious images must have been cast in isinglass over the centuries, although few survive. Isinglass is sensitive to water, breaks easily, and is attractive to mice, mould and parasites. A set of six green coloured gelatin sheets with images in red printing ink was donated to Herzog August the Younger of Braunschweig-Wolfenbüttel in 1646. They are casts of the engravings made for a booklet describing and illustrating a sculpture project glorifying the duke (Fig. 269).

Rarely documented objects are wax casts of inked printing plates.[700] The one example found shows white ink on a cast of red wax, reinforced at the back with red silk (Fig. 270).

Modern developments

Casting printing plates is still an option for the modern printmaker, both for older materials and new ones such as plastic or rubber.[701] The modern printmaker may consider a cast of his printing plate as a work of art on its own merit, either as such or as (part of) a relief or sculpture. Vacuum-form prints are made in a machine that heats a plastic plate to soften it. Next the plastic is moulded around the printing plate and into the surface structures by vacuum pressure. The technique is especially effective for collagraph plates with a strong relief. Printing ink is not picked up, but a counterproof can be offset onto the plastic before moulding.[702]

Other manners of casting or embossing reliefs in plate materials are more akin to sculpture and lead us into a direction too far away from our discussion. An exception might be made for latex, which can pick up printing ink.[703] Paper casts combine casting a plate with a strong relief in paper with intaglio printing. A papermaking mould is dipped in a vat of pulp and the sheet couched on the plate. While the water evaporates from the paper, the fibres make sufficiently close contact with the ink to produce an image on the sheet.[704]

Printing editions

The essence of printmaking is the replication of the image. It is aimed at marketing, at trade and at communication to a larger audience.[705] Printed imagery disseminated for economic reasons (eg for profit), for religious purposes (eg evangelism, meditation), for political goals (eg polemics and satire), or to spread the fame of an artist (inventor, engraver). Publishing an edition of a print allowed the engraver to work independently without having to rely on a patron.[706] Vice versa, a print of a painting, building or person could be acquired as a souvenir or memento to be shown to friends and family.

Hundreds or even thousands of people could see the same image at the same time or an individual could admire it over a longer period of time without the need to travel to see one unique painting or sculpture. A print could be acquired for a considerably smaller sum than a unique object, such as an original painting, and the edition could be disseminated over a large area without much difficulty. Information on the printing of editions, about the numbers that could and actually were produced, and about techniques to expand the number of impressions and to extend the life of a matrix will, to quote Bowen and Imhof, 'make a valuable contribution to our understanding of a variety of topics, for example: how widely spread certain images might have been, how profitable their independent sale could have been, and how costly engravings or etchings were, in the long run, to use as book illustration'.[707] Next we will look at what was technically feasible and finally consider the market for prints.

Techniques and materials

How many prints a plate can supply is first and foremost dependent on the quality required of the impression. Remarks such as 'good' or 'worn' are subjective and should be viewed through the eyes of contemporaries and from the point of view of a customer or dealer. Otherwise plate wear is only the concern of the engraver and publisher, and a reason for choosing particular techniques for producing the print.

The total number of impressions that can technically be pulled from a plate is related to the plate material, the texture in the plate's surface, the cleaning and polishing of the plate, as well as to the pigment in the ink and the manner of wiping. An engraving will better withstand wear than an etching because engraved grooves are relatively deeper

than etched ones.[708] The section of an etched groove is U-shaped whereas the section of an engraved groove is V-shaped (Fig. 271). In general, the depth of an etched groove is proportionally shallower than the width. Consequently soon after the edges of the groove start to wear, the bottom of the groove is touched in wiping and so much ink removed that the etched line will look grey – this is called a *crevé*. In particular, when lines are etched only shortly, ink is largely retained by the coarse bottom structure of the groove, quickly wearing the structure and leaving thin dark lines at both edges of a printed line. Due to the lack of ink, impressions look pale, and because of this lines may be re-engraved or re-etched early in the life of an etching plate that is commercially interesting. When the edges of an engraved groove begin to erode, less ink can be contained in the groove and the lines will become narrower, but will still look black. An impression of a worn etched plate with additionally engraved lines shows grey etched lines mixed with dark engraved lines (Fig. 272). From this it follows that when lines are engraved or etched wider and deeper they will last longer than shallow engraved or etched grooves.

Drypoint and mezzotint are particularly sensitive because with these techniques burrs are raised in the production process. Engravings and etchings do not wear by just running through the press, but drypoint and mezzotint burrs are easily compressed in printing even when steelfaced.[709] Drypoint burrs may even break off. In the process of inking and wiping the pigment particles act as an abrasive, gradually wearing down the angular edges of the grooves. Subsequently less and less ink can be retained within the textures of the plate, and impressions exhibit less contrast in the course of the edition.

The harder the plate material, the longer it can withstand abrasion. Cardboard, plastics and tin are the softest materials, followed by zinc, then copper and finally steel. In comparison, an average etching in zinc, with lines of about a 0.25 mm wide and deep, may last for a few hundred impressions before the quality becomes unacceptable. The same design in copper may pull 500 copies or more and in steel 10,000 or more. It further depends on the treatment of the metal, and whether or not it has been hardened in some way.

Iron plates were used for etching from the mid-1490s to the 1540s, and occasionally also later. The metal is hard enough to withstand an edition of several hundred copies, but iron rusts quickly once the unprotected plate is set aside for a while and the corroded areas always show up in later impressions as greyish or punctured stains.[710] Hardened to steel, the iron plate was again used for steel engravings in the nineteenth century.

Copper was the common metal used for plates up to 1800. Hammering the copper plate cold renders it more compact and thus more wear resistant.[711] Instead of plain copper, brass was also used. This copper-zinc alloy is harder and may yield twice the number of impressions compared to copper.[712] Bronze, a copper-tin alloy even harder than brass, is mentioned, but would have been used only occasionally because its composition is not as homogeneous as plain copper.

Zinc printing plates were experimented with after 1800. Zinc was probably not used in commercial intaglio printmaking because it is too soft to produce large editions. The even softer tin and pewter plates were used mainly for printing musical scores. They were produced with punches hammered deep into the plate so enough prints could be pulled from these soft metal plates without the need for any refinements. All other metals used in intaglio printmaking, such as aluminium, lead or magnesium, are too soft to withstand any longer print runs.

Number of impressions

The first documented reference to the maximum amount of impressions that could be pulled from a plate is found in a note by the Antwerp printer and publisher Christophle Plantin of the period 1572–1576.[713] He states that an edition of 1,000 can be pulled from an engraved plate for book illustration. The Antwerp financier Gérard Grammay estimated in 1580 that a well-engraved, not etched, copper plate could print an edition of 1,200–1,500, even up to 2,000 in some cases.[714] These numbers accord with those given by later sources.[715]

A longer print run can be pulled from deeply engraved plates than from finely engraved plates.[716] A greater number of good prints can be pulled from engravings than from etchings, and more from deeply etched plates than from finely etched plates.[717] Henrici (1834) noted that well-engraved plates give 1,500 good impressions, the next 1,500 lose their quality and from 3,000 to 4,000 the prints are grey, drab and weak.[718]

Straightforward engraving and etching of lines, such as for geometrical and architectural designs, is not very demanding and might yield several thousand more impressions.[719] Plates in aquatint, soft-ground or crayon engraving have only shallow and sensitive textures, which allow just a few hundred impressions.[720]

Mezzotints and drypoints on copper wear faster than engravings because of the raised burr that is flattened in wiping and printing.[721] Ludwig von Siegen, inventor of the mezzotint technique, was well aware that his plates did not endure large editions. Reporting on his new method in 1642, he wrote that normally thousands of impressions could be pulled from an engraving, but because his technique is rather sensitive the plate allowed only a small number (*nur etlich wenige*) to be printed.[722] The first details about the printing of a mezzotint plate date from 1661. Prince Ruprecht von der Pfalz showed a mezzotint plate to Robert Murray on 6 May 1661. On the same day, Murray wrote to John Evelyn: 'it will print 100 copies before it need to be toucht, but that his man must print them off, at least none else must handle the plate'. In other words, the mezzotint burr is sensitive and the printer must take extra care in preparing the

ink, in wiping, the amount of pressure exerted in printing, and in cleaning the plate again afterwards.

The number of a hundred good impressions of a mezzotint plate is fairly constant throughout the centuries, depending on the subject and the required quality of the print.[723] Tobias Querfurt wrote in 1792: 'The earliest impressions of a mezzotint are too dark, rough and hard. The nicest ones are commonly numbers fifty to seventy when the roughness is gone and the plate still lively and powerful. Of an edition of three hundred the second fifty are best.'[724]

Table 6 summarises edition numbers. Numbers can diverge significantly depending on the technique and material, for example, the depth of a groove and the skills of the plate printer. What is clear from the table is that deeper grooves and harder plate materials print longer runs.

Further developments

There was a demand, from the late eighteenth century onwards, for more hard-wearing plates that would allow for very high print runs of engravings and etchings – not just a few thousand but tens of thousands. This was fuelled by the growing numbers of illustrated publications.[725] More important was the need for papers of value produced in large amounts and of a quality that could not be counterfeited, which demanded new materials and techniques. Glass and steel were both tried and the first results were promising – producing runs of 10,000 and above.[726] However, the problem with glass was its fragility and the difficulty with steel was that the plates buckled due to the softening and hardening processes. The demands were clear and the technical problems recognised – all that remained was to find the solutions.

Jacob Perkins was the first (1810) to introduce a process suitable for steel blocks aimed at printing papers of value, ideal for editions of 100,000–500,000.[727] Charles Warren's thin plates (1819) could yield editions of 20,000–25,000, which was enough for artwork, such as decorative wall pictures, portraits and book illustrations.[728] The firm of Perkins, Bacon & Petch printed the first English postage stamps in their millions, starting in 1840. By transferring the original engraving 240 times to one steel plate and preparing eleven steel plates that were printed simultaneously they could produce 240,000 stamps per day. Numbers increased later on.[729] This marks the advent of the new printing trade and its expansion in the following decades, with the subsequent separation of the graphic arts from the printing trade.

The finest textures could be achieved and printed with the highest possible contrast in editions of many thousands by means of steel engraving. Nevertheless, with the introduction of steelfacing in 1858, the engraver returned to copper as being more reliable and easier to work on than steel.[730] Copper does not corrode, provided that it does not come into contact with water, acids or salts, and it can be worked easily by tools and mordants. Covering the surface of the ready-prepared copper plate with a thin layer of steel by means of galvanisation was effective.[731] At the first sign of wear the layer can easily be removed with diluted nitric acid without affecting the copper and the plate steelfaced again to allow virtually continuous printing.

The introduction of steel plates also increased the number of editions of mezzotints but with numbers of just over 1,000, it was still not comparable to the tens of thousands that an engraved or etched steel plate could achieve.[732] This also applied to steelfaced mezzotints on copper from 1858 onwards.[733] The steel coating could be removed once it had started wearing and the plate faced again in order to print the next thousand, but the problem with both is that the burr is compressed in printing and no longer holds much ink.

Other metals, such as nickel, cobalt and chrome, were also found to be suitable for facing copper plates. The very hard cobalt was tried with good results – this metal does not rust and can be removed without corroding the copper. This would seem to make cobalt advantageous for the galvanisation of copper plates, but apart from Gaiffe's suggestion in 1878, there is no further mention.[734] In practice, apart from iron we only find chrome, which is good for printing tens of thousands of impressions.[735]

Of the modern plate materials, polymer films and solarplates are popular. The plastics were originally designed for relief printing which does not require as much endurance as intaglio printing. Consequently they are soft and do not withstand wear for very long. A maximum edition would be 125, but usually only a few dozen impressions can be pulled from them.[736] The edition number depends mainly on the inks used. Soybean oil inks designed especially for this purpose wear the plastic less because they contain finer pigment particles than other inks.

Acids and metals

With etching, it is not only the kind of metal and the depth of the groove but also the type of acid used that is the deciding factor. Nitric acid bites quickly but has the disadvantage that it widens the lines considerably although this does depend on the kind of metal used – with zinc it acts a little more laterally, with copper more vertically, so proportionally lines etched in zinc tend to be wider than lines etched in copper. Mixtures of salts in vinegar bite more slowly, but more vertically. Longer print runs can be pulled from plates etched with this mordant.[737] Etchants such as ferric chloride and Dutch mordant, introduced in the nineteenth century, are aimed at more continuous working and more vertical biting. The copper sulphate solutions for etching zinc and steel that came into use by the end of the twentieth century etch grooves markedly deeper than nitric acid.[738] Consequently again somewhat larger editions can be pulled.

Editions of book illustrations

If prints were intended for book illustration, the late sixteenth-century contracts of the Plantin-Moretus printshop in Antwerp reveal that editions were counted in hundreds, rarely in thousands.[739] Plantin could decide to illustrate some copies with engravings, the remainder of the run with woodcuts. For example, a breviary for the Spanish market, shipped on 12 October 1575, was printed in an edition of 1,200 of which 1,083 were illustrated with woodcuts and 117 with copper engravings.[740] The printing office published a *Missale Romanum* in 1596 in an edition of 1,250 copies, 600 of which were illustrated with engravings and 650 with woodcuts.[741] Numbers of editions of engraved or etched book illustrations increased to reach the thousands in the seventeenth century and even higher in the eighteenth century.[742]

Engraved title pages of missals published in 1598 and 1599 were printed in editions of 1,500 and 1,300 respectively.[743] The illustration of a missal with either woodcuts or engravings might explain why numbers for engraved title pages are higher than for illustrations. A more refined engraving would have been preferred for the opening page. Nowadays books have colourful covers and wrappers to attract the buyer's attention, but in that period commercial bookbinding did not exist – a book was offered for sale as an unbound set of quires. The title page was the first page of the volume as displayed in the bookshop and therefore needed to be attractive to stimulate the sales of the book.

Number of impressions per day

A further question to be considered is how many impressions could be pulled per day. The amounts differed depending on the size of the plate, the design, the kind of metal, the technique used for making the plate, the ink, the manner of wiping, and the quality of the impression desired. Tempesti mentioned that 80 to 100 prints could be pulled from portrait plates per day, the number reducing to 50 for large plates.[744] The number of a 100 portrait plates per day is also confirmed by eighteenth and early nineteenth-century sources, while numbers for plates with simple designs could reach up to 300 per day.[745] These references are to copper plates however – steel plates wipe a little easier than copper plates and thus give slightly higher numbers.[746]

Whether the individual was working alone or together with others is also relevant. Some printshop interiors seem to show that plate wiping was performed by the more experienced printers, while the press was turned by an assistant or apprentice (see Fig. 11 (right), p. 12, Fig. 64, p. 77, Fig. 68, p. 80, Fig. 70, p. 82, Fig. 78, p. 92, Fig. 85, p. 98, Fig. 86, p. 99, Fig. 88, p. 99, Fig. 91, p. 102, Fig. 97, p. 105, Fig. 225 above).[747]

Refining the division of labour improved results. One plate could be inked, wiped and printed by several men working *en train* and several plates could be processed in parallel in this manner. Berthiaud described how 450 impressions could be pulled per day with a three-man crew, a figure that increased to 700 impressions per day with a four-man crew. Using three and four plates respectively that circulated between them, the printers worked *en train*.[748] This may explain how the plate printer of Cambridge University Press, John Ebrall, could print 750 impressions per day at the end of the seventeenth century.[749]

Printshop manners

We can consider maximum edition numbers and the maximum number per day, but workshop practice may be different again. Looking at depictions of printshop interiors we commonly see laths or ropes hung with drying prints. Some interiors are so detailed as to provide a good idea of a printer's daily activities. For example, Bosse's 1643 printshop shows three people at work – two adult men are wiping plates and a boy is printing (see Fig. 68, p. 80). The day's output is on a table to the right of the press; the prints pulled earlier are hanging on ropes from the ceiling. In the first row of prints, numbers one to three from the left have been pulled from the same plate, but the rest are different. It is possible that the last two on the right in the second row are identical. Assuming that the total image is a compilation of realistic elements, demonstrating the activities of a common intaglio printshop, the prints hanging from the lines might imply that plates were printed on demand. A printseller or publisher might order, for example, 50 impressions from one plate, 20 from another and so on.

It was not uncommon to print part of an edition on larger paper, on a different kind of paper, on coloured paper, on parchment or on textile.[750] This was probably intended for a particular clientele such as benefactors or collectors, but also for commemorative and political purposes. There may have been occasions when a publisher ordered a plate printer to deliver only part of the agreed edition, or he may have just delivered a plate and requested a specific number of proofs depending on his needs.[751]

The plate starts to wear during the printing process from the moment the design is ready. The engraved plate might require some scraping and polishing to remove burrs and unwanted scratches.[752] When engraving or etching is finished the plate is cleaned.[753] The edges of the freshly cut or etched grooves lose their initial sharpness during this cleaning causing the first wear of the plate even before printing commences because the edges of the grooves start curving from the surface of the plate inwards. On close observation these curves appear to reflect light. The total surface of the inward curved area, ie the upper parts of the V- or U-shaped groove that becomes curved, will increase upon wearing, and less and less ink will be retained behind the edges within the grooves (see Fig. 272). This is why the

impressions appear weaker, ie more grey or less black.[754]

Ink is rubbed over the surface and into the grooves of the plate. The pigment particles in the ink lightly abrade the surface resulting in the second instance of wear. The plate is wiped clean with cloth and paper, by hand, and rubbed with whiting causing further wear. When the day's edition has been printed the plate is cleaned, resulting in further wear because the plate is rubbed with a cloth and solvent to remove the ink from the grooves and the surface, and both the cloth and the remaining pigment particles polish the plate. All this is repeated every time the plate is reprinted, causing further loss of material.

Generally charred organic blacks are used for intaglio printing ink. When charred bone or wood is crushed, ground and sieved to micro-scale, the cell structure of the original material is still present, the particles being hard and angular. The popularity of Frankfurt black can be explained by the lees of wine that are used – spongy matter not at all angular.[755] When charred, crushed, ground and sieved, this pigment would wear the plate less than other pigments with harder and angular particles.

Enlarging the edition

Different means were sought to prolong the life of a plate and extend the edition, a common way being to re-engrave worn lines, found from the later fifteenth century onwards.[756] The advantage of reworking the plate is that it extends and may even double the print run.[757] The worn groove is gouged with a burin to make it a little deeper and wider. Sometimes it can be seen that the worn line was not re-engraved, but that a second line was engraved adjacent to it. Re-engraving the plate is a practice often found, though usually with inferior results – either the lines and shades have lost their subtlety or the engraver simply added extra lines with scant regard for the authenticity of the original work.

Re-etching is also possible. In the more straightforward method, all of the plate's surface – or only the part to be re-bitten – is ground by dabbing or rolling up the plate, taking care to ensure that the grooves remain open. Another easy method is to first fill the grooves with a water-soluble paste such as watercolour paint, cover the plate and let the paste dissolve in water as with lift-ground.[758] Remaining material has to be scraped out off the grooves with a needle. Liquid ground, or warm ground in its liquid phase, tends to reticulate from the grooves exposing the edges to the acid, illustrating the disadvantage of re-biting a plate: the lines tend to widen rather quickly and the etching may look darker or heavier. As with re-engraving, the image will lose its subtlety.

Similarly, mezzotints can be reworked to come close to the original tint by locally rocking worn parts and carefully burnishing away the burr.[759] Reworking allowed mezzotint plates to be printed in editions of some thousands.[760] Any refinement disappeared in the course of reworking, however, leaving only insubstantial masses. Nevertheless mezzotints are occasionally found in printed books in the form of authors' portraits or frontispieces and even, though rarely, as illustrations in periodicals (Fig. 273).[761]

When a particular image proved to be popular, the same image could be engraved again on a new plate if the first plate wore out.[762] P. Melchior van Woonsel S.J. had engraved two copper plates after one design of twelve saints shortly after 1594. The prints pulled from the plate were cut into twelve for the monthly distribution of images of saints to members of local sodalities, religious societies for laymen in the Antwerp region. By 1609 the plates were worn so badly that four new plates were ordered.[763]

An effective way to increase the edition was to engrave the same design twice or more on one plate.[764] The plate would be editioned and its prints cut to separate the different images. This gave the total amount of the number of the edition multiplied by the number of copies of the design on the plate.[765] Alternatively, more plates could be engraved with the same subject. If two or more engravers were available, they could work in parallel.[766] To maintain a certain quality, one engraver could make more plates of the same subject. Cochin engraved the vignettes for *Etrennes mignonnes pour l'année 1741* (5,000 of which were printed) four times, giving an edition of 1,250 copies per plate.[767] A total of 202 plates with the portrait of Louis XVI were produced between the months of June and November 1790, the plates to be printed in a total edition of 400,000 impressions.[768] With such working practices, variations between prints of different plates are negligible and are best observed by comparing impressions next to each other.

One way of reducing the differences due to wear is to start printing the edition with a greyish ink for the first impressions, making the ink blacker in the course of printing.[769] Mezzotint plates are still suitable for printing in colour when the burr is too worn for the plate to give good contrasting black impressions.[770]

New ways of working

With the introduction of so many new printmaking techniques in the nineteenth century new ways were developed to permit longer print runs. A replication process for steel engravings typical of the engineering practices of Jacob Perkins was described as follows: 'a soft steel plate is engraved and hardened; from this an impression is taken upon a softened steel roller [by passing the softened roller over the hardened plate with high pressure]; this steel roller is then hardened, and softened steel plates being passed under it, an impression is imparted to them; they are then hardened, and are equal to the original as to their impressions'. The method was used to produce printing plates for

banknotes and postage stamps.[771]

The invention of lithography provided another means of offsetting a freshly printed proof from a steel engraving onto a lithographic stone or plate. [772] The embossment is, of course, not reproduced and there is a noticeable loss of detail. The process involves printing the plate with special ink on coated paper, which in turn is offset onto a plate or stone, followed by normal lithographic printing. The process permitted faster printing – unlike intaglio printing, lithographic printing was mechanised. In addition, one image could be offset onto several stones to be printed simultaneously. Other processes for reproducing steel engravings were invented in that period, but never disclosed.[773]

About this time printing plates were also replicated by means of galvanisation, so-called 'electrotypes'. Initially the copper of electrotype plates was too soft to withstand more than a few hundred impressions compared to its original in hammered copper.[774] Further development of the process increased the quantity to 2,000, especially if the plates were steelfaced.[775]

A close reproduction of a print can be achieved using a photomechanical technique.[776] A print is photographed and the photograph used to make a new intaglio printing plate of the same design. A typical example is found in the second edition (1878) of Lalanne's manual. *Planche 1* illustrates the first state of an etching and *planche 2* the same with additionally etched lines.[777] The etching plate would have been editioned in its first state for the 1866 publication, after which it would have been reworked illustrating the second state and once more editioned. The plate was, of course, no longer available in its first state for the second edition of the manual 12 years later. Lalanne therefore made a new plate (in reverse), the first state of which was photomechanically reproduced for a new etching plate to be used for *planche 1*.[778] The original plate was etched further and used for *planche 2*. From here on these two, probably steelfaced, *planches* are found in all following editions.

If the photomechanical plate is exactly the same size as the original plate, its impression will be a close match to the original print because both are printed in intaglio. Any deviations between the original print and its reproduction would be seen in the relief of the lines because with photomechanical processes there are fewer differences in volume between thinner and thicker lines than in the original. Other differences include the ink recipe, the choice of paper, the manner of wiping and the amount of pressure used in printing.

Market demands

Material, technical and human limitations determine the number of impressions that can be pulled from a plate but how many copies actually were printed per plate depended on market demand. An employer might require a specific (usually round) number of impressions of one plate. Contracts from the sixteenth to the nineteenth century are found in which this is stipulated. For example, engraver Paolo Farinato of Verona was contracted to deliver 1,000 copies in 1594.[779] Further clauses in the contract make clear that the publishers demanded that the plates should be of a particular quality. They should be able to print up to a minimum number of impressions or they should not be too worn when acquired already engraved. Jean de Courbes drew up a contract for a book on the *Eucharist* in Madrid in 1621. The plates for the illustrations had to be produced in such a way that 2,200 prints could be pulled from them.[780] The Rotterdam engraver and art dealer Philips Bouttats supplied the book dealer Pieter van der Slaart in 1695 with 133 engraved copper plates of which never more than 100 copies were printed and thus were in good condition.[781] Hendrick van der Marckt contracted Bernard Picart to oversee the engraving of 212 plates for a printed Bible in Amsterdam on 24 October 1710. Item two of the contract stipulated that, 'Picart will engrave, or will have engraved (the plates) in such a way that at least 2,500 good impressions can be printed from it and later on more could be pulled from them.'[782]

Limited edition

So far, the above discussion has focused on the maximum numbers that could be pulled from a plate but the opposite of this is the 'limited edition'. Limited editions were already being produced in the seventeenth century, at a time when print collectors became seriously interested in earlier states of prints. When Anthony van Dyck started the series of portraits for his *Iconography*, he seems to have known for whom he was producing these portraits. Looking at the first prints he drew on the plates we see a different approach to the concept of 'edition'.[783] It has already been mentioned above that the majority of the portraits in the first or second state survived in numbers from 20 to a maximum of 28.[784] All later states were further processed by professional engravers for the trade edition, but these early states have always been treasured for their *non-finito* aesthetics.[785]

If some losses and unknown copies are taken into account, then it may be safe to say that the versions regarded as finished by the artist were probably printed in editions of thirty. The number of impressions seems to point to a small group of art lovers who could appreciate the modernism of the *non-finito*. Here we can speak of a limited edition in the sense that the prints were meant for a just a small group. The following trade edition was printed from the 'finished' plate, which was engraved from edge to edge. A similar approach can be seen in a number of etchings and drypoints by Rembrandt van Rijn produced in states (see Figs 210 and 260). He used additional drypoint to radically change the appearance of the print, however the sensitive burr of the drypoint line would not survive a commercially

viable edition. Therefore the modest output was either to satisfy his own creative interests or to offer impressions to a few connoisseurs for a special price, or possibly both.[786]

The idea of the limited edition of a print became more established in the eighteenth century when proofs 'before letters' and 'after letters' were published. A small number of impressions were printed from the plate without any lettering in the bottom margin, ie before letters. Then the lettering or address was engraved in the plate and the much larger trade edition was printed.[787] French examples of printing only a few hundred to a thousand impressions (decided in advance to avoid exhausting a plate) show that such editions were aimed particularly at print lovers and collectors, a custom adopted by other countries.[788]

By the end of the eighteenth century the tradition of the 'cancelled plate' appeared, ie to ensure that the edition was indeed limited the plate was destroyed.[789] Signing prints, in ink, at the bottom or back of the sheet became habitual as a mark of originality; the same is seen in books of the period.[790] This developed further in the nineteenth century when the 'pencil' signature of the printmaker appeared on the print.

It became more common to emphasise the rarity of printed artworks by numbering the prints.[791] Since the beginning of the twentieth century edition numbers have been added such as '24/40', ie copy number '24' of a total print run of '40' copies. The numbering of 'artists' proofs' and *hors commerce* proofs also became common although these numbers do not appear in the trade edition. Numbering and signing the edition in pencil is considered a guarantee of original, handmade art prints and quality. However, it is only a tradition and not a legal requirement or backed by law. Commercially it is standard practice to include artists' signatures on reproductions of their drawings and watercolours, whether printed offset or digitally, to give them the authentic appearance and status of originals.

Modern developments

A limited edition meant that the modern printmaker need not concern himself with the problems associated with printing long runs of many hundreds or even thousands. Wear was no longer an issue following the introduction of steelfacing and all copies in the edition could look identical by taking the trouble to print them homogeneously. With the introduction of new printing methods, such as plate tone and *retroussage*, another concern emerged – namely how to maintain a consistent quality with these more difficult to control variables. The majority of printmakers who printed themselves would have developed a certain skill in handling their own plates[792] but this would have been limited when compared with the professional plate printer trained in the craft and working six days per week. On the other hand, however, it is unlikely that a professional plate printer would print the plates in quite the same way as an artist who printed his own plates. An edition printed by a professional plate printer might look immaculate but it would lack a certain character and the personal touch.

A cancelled plate could be scratched diagonally with a drypoint, corners could be cut off, holes drilled in the plate, or the plate may be destroyed, and the 'cancel proof' finally pulled.[793] Hayter cancelled a plate 'by engraving his signature over a chosen worked area'.[794] Nowadays the plate is likely to be reused for other purposes such as reworking, combined with other plates to make new imagery or even enjoy a new role as a unique sculptural object. Printmakers may also vary the impressions during printing an edition – more or less plate tone can be employed (compare with the impressions by Lepic), colours can be added and changed, other elements added, or the plate may gradually be destroyed in the process. As expressed by Welden and Muir: 'The artist uses the matrix as a tool for creativity, and whether the prints from one edition are identical or variable, each print is an original.'[795]

Printing series

The history of print collecting has gained more interest over the past few decades[796] with research concentrating on historical collectors and the types of works they acquired. However, the physical aspects of collected prints, more particularly print series, have received less attention.[797] The physical appearance of a bound print series can provide information on the production of the series, its publication, trading and collecting.

Definition of a print series

A 'print series' can be defined as a coherent group of prints produced in the workshop.[798] Important criteria are that the prints should have the same theme, designer, engraver and publisher. They are often preceded by a title plate, numbered consecutively and may have the same or similar decorations around the image. The printing plates are often the same size and are printed on the same paper. It is not unusual for a series to be accompanied by letterpress text in the form of an index, introduction or captions to the plates. Engraved texts with the same functions are also found. Typical of a print series is that rather than illustrating the text, the texts explain the plates. Different print series bound together with other series in one volume usually have similar themes.

Some kinds of special print series have very large designs that are too big for one plate. These are produced by printing the separate plates of the composition, trimming the impressions within the plate marks and pasting the

parts together. This technique came into use for engravings and woodcuts in the later fifteenth century, such as for Mantegna's *Battle of Satyrs Riding Seahorses with an Old Woman*, printed on two sheets from two plates and pasted together to form one image of approximately 28 × 83 cm.[799] The first really large intaglio printed example is the frieze-like *Entry of Emperor Charles V and Pope Clement VII in Bologna on 24 February 1530* etched by Nicolaas Hogenberg on 40 plates between 1530 and 1539 (see Figs 210 and 271 above).[800] This series and similar successions are usually found folded to *leporellos* now, but may originally have been produced in rolls.[801] These objects are several metres in length but they are one-dimensional because they are only one sheet high. An extreme example is a reproduction of the relief of the Trajan Column in Rome etched on 130 plates, the prints pasted together having an approximate length of 57 metres.[802] A large, two-dimensional object is a seventeenth-century 'Crucifixion' by Matthijs Borrekens after Van Dyck, the nine sheets for the image and two sheets for the text together measuring 196 × 126 cm.[803]

Bound print series

Plates printed on full sheets, or on half or quarto sheets cut in advance if plates were small, were often kept together by a simple stitch. The thread passed through two holes stabbed through the top or the left short margins of the sheets, with the ends of the thread tied together.[804] The disadvantage was that the binding was not tight and the sheets could move and rub against each other. The upper sheets could also come loose when the paper around the stitch holes tore. It is not uncommon to see two holes, one above the other, indicating that the sheets have been re- stitched. Examples of sixteenth–eighteenth-century prints on full sheets with deckle edges, unbound and without stab or stitch marks also exist,[805] providing information on the practices of printshops of that period.

Dealers or collectors bound quires of print series in volumes much in the same way as quires of letterpress text were bound. This practical solution both reduces the amount of space taken up by the volume and protects the leaves within the binding. Observations regarding print series are often based on the holdings of printrooms, which keep prints published in series mounted individually and in boxes.[806] Once mounted, the prints were ordered by the engraver or inventor and other works by them could be inserted in between. Mounted prints can be easily exhibited and they allow the audience to concentrate on the aesthetics of the image surrounded by the white mount. The main drawback of mounting is that it removes the prints from their original material context, more particularly the kind of book format used in its production, which was also the format in which the prints were traded and collected.[807]

The concept behind the bound volume is that both thematically gathered printed images and printed texts were seen as a means of communicating information on particular subjects, as well as displaying beauty in a predetermined order. Institutionalised printrooms were established in the eighteenth century. Due to new concepts and ideas regarding images and texts, prints became separated from library collections and gathered in new ensembles in printrooms – this even went as far as taking albums apart and dispersing their prints into boxes and portfolios.[808] Pasted-in prints were often detached from manuscripts and printed volumes, so unfortunately we have no idea of their original appearance, context and provenance.

Methods of printing series

Scholarly interest in collectors' albums with pasted-in prints is growing[809] but the study of bound series of prints deserves equal attention.[810] The discussion here concerns bound print series that have never been separated or trimmed from their margins. Research into the physical appearance of bound print series may reveal how they were produced, traded, collected, bound and kept over the centuries. There is a good chance of finding such series in libraries, particularly those that hold older collections with provenances dating back to the sixteenth and seventeenth centuries.[811]

The printing of one plate on one sheet of paper follows the standard practice described above. Print series produced this way are, of course, also found in volumes but they are united by the binding process not by the printing. The following discussion concentrates on the printing of two or more plates of one series on one sheet of paper, for which two main techniques can be discerned. In the first, two plates are printed next to each other, each in the middle of one half of one full sheet, in one run of the press; half sheets may be used with smaller plates.[812] When the sheet is folded in the middle the two prints face each other. In the second, one plate is printed in the middle of the right half of the front side of a full sheet in the first run. The other plate is printed in the middle of the other half of the verso of the same sheet in the second run. When this sheet is folded in the middle both plates appear on the recto sides of the leaves of the bifolium.

In both cases the sheets comprising the series are piled up and folded through the middle of the long side to form a booklet held together by a stitch in the fold. In the first technique, one half of the print series can be seen on the left-hand (verso) pages of the first half of the booklet and the other half on the right-hand (recto) pages of the second half of the booklet. The second method is more sophisticated because when leafing through the booklet all prints are reproduced on recto pages.[813] Printing on both halves of one sheet has the advantage that the sheet is big enough to hang over a rope or lath in order to allow the paper and ink to dry; small sheets are too stiff to ply around the rope or lath. The further importance of these methods is that knowledge on the technique of printing two or more plates in

particular positions on one sheet was a prelude to the experiments with the multiple-plate colour printing techniques of the later sixteenth and seventeenth century.[814]

There are other reasons for printing several plates on one sheet using one of these techniques. The contract of 20 January 1584 between Pietro de Nobili and Giovanni Ambrogio Brambilla makes mention of a series of 200 etchings of herbs. The plates were each to be the size of a hand in order to print four plates together on one sheet of *carta mezzana*.[815] The sheet could have been cut in two horizontally to make a booklet, or in four, separating the images and stitching them together, but the text does not suggest preparations for making a bound print series.[816]

The way the booklets are formed ensures that the series is kept in the right order, the bifolia often being supplied in one quire, sometimes in a few quires.[817] The folding of the sheets protects the prints within the quire. Stitching them in the fold prevents the bifolia from being separated, the quire from falling apart and the images from being damaged. The stitching is sufficiently tight to avoid the sheets rubbing hard against each other and further protection can be provided by a simple wrapper.

Trading print series

The binding of various print series into one volume is usually done either by a print dealer or a print collector. The physical context of the volume as a whole can provide more information on the period in which it was compiled. For example, when Italian and Antwerp print series – each series printed on a different kind of paper – are found in one volume together with endpapers or interleaving papers made in Germany, then it is likely that a German print dealer or collector gathered the series and had them bound. The combination of contents, and the difference between paper used for the print series and that used for the additional blank quires and endpapers, together with information on the binding, could provide answers as to where and when particular series were printed, and where and when the volume was compiled.

Printing two or more plates on one sheet in order to fold the sheets to make a booklet largely disappeared in the nineteenth century. Instead it became common to supply series as a pack of prints stitched together at the left-hand side, a technique already practised in the sixteenth century.[818] Supplying the series as a pile of loose sheets kept in a box custom-made for the series seems to be a development from the late eighteenth century. Apart from these more formal production methods, there is the modern genre of the 'artist book', in which virtually any binding method is possible.

Colour Printing Procedures

Four different methods are used in colour intaglio printing: in the first (the oldest) a single colour is printed from one plate; in the second, two or more colours are printed next to each other from one plate; in the third, two or more colours are printed from two or more plates next to each other; and finally two or more colours are printed on top of each other from two or more plates respectively. Any combination of these techniques is possible and printing in intaglio may be combined with any other printing technique. Furthermore, a plate can be printed on a coloured support, the surface of an intaglio plate can also be inked, and the print can be coloured by hand.

There are only a few studies known on the history of intaglio colour printing and these are based on a limited number of research materials. It was not until the second half of the eighteenth and the late nineteenth century that more materials and studies became available respectively. Therefore from necessity the following text takes a somewhat fragmentary approach to the earlier period while the eighteenth century is treated in greater detail.

Intaglio colour printing developed quite slowly from the fifteenth to the eighteenth century. The relatively few known extant colour printed proofs from before 1700 demonstrate an awareness of colour in intaglio printing and provide evidence of experimentation. At that time, however, colour relief printing in the form of the *chiaroscuro* woodcut was preferred. Once intaglio printmaking became established as the primary graphic process, colour printing of engravings and etchings appeared on a larger scale. Thus began the first wave of intaglio colour printing with the works produced in the printshop of Johannes Teyler from 1688 to 1698 followed by a second wave in the second half of the eighteenth century with the introduction of intaglio reproduction techniques. The third wave, stimulated by the import of Japanese colour woodcuts in Europe, was at its height in the last decade of the nineteenth century with the fourth wave following as a result of the increased popularity of graphic techniques in the 1960s.

The subject of intaglio colour printing has been little studied and relatively few colour intaglio prints from before Teyler are known yet. Nevertheless, recent technological developments such as digital photography, the large-scale digitisation of book and print collections, book and print databases, and the online exchange of information have stimulated print keepers to reassess their materials, which in turn has attracted the attention of print researchers. This has resulted in a large number of (re)discoveries of early engravings and etchings printed in colours.[819] From what

I have seen I think a case can be made for the continuous presence of monochrome intaglio printing from the later fifteenth century on. Polychrome intaglio printing appears more experimental with the number of examples growing persistently from the late sixteenth century on, though, until becoming common in the eighteenth century.

Monochrome printing

The functions of printing in colours are diverse. The general argument for early colour printing is that the prints may have been intended as presentation copies to a favoured patron or friend, but we can also discern further reasons. *The Madonna with Child in a Garden* by Master E.S. (1465–1467) is printed with white ink on blackened paper (see Fig. 44, p. 44). The copper plate was engraved specifically to be printed in white upon black, as shown in the engraved highlights and the engraved whites of the eyes.[820] This may be regarded as an experiment, both in artistic design and technical skill. The negative of intaglio printing clearly maintained printmakers' interest as more examples of intaglio printing in white on black are found throughout the centuries (Fig. 274; see also Fig. 270 above).[821]

Other fifteenth-century colour intaglio plates are printed monochrome in blue, green, brown or red.[822] In a number of the etchings from the School of Fontainebleau (1542–1548), printed in pinkish red, brown-red or darker brown (Fig. 275), the experimental character of the etchings made at the French court can be observed.[823] It is possible that the reddish colours were chosen due to their resemblance to a red crayon drawing.[824] Red impressions are found of sixteenth- and seventeenth-century engravings and etchings that are otherwise printed in black[825] possibly for commercial reasons – the plates were probably reprinted in red for a later limited edition intended for collectors.[826]

The shade of colour-printed engravings and etchings is determined by the colour of the ink lines mixing optically with the white of the paper next to the lines when observed at some distance. Printing tonal mezzotint plates in monochrome brought a refinement. Their surface textures of series of tiny burrs and the hazes of ink around them created more transparency of the ink layer,[827] allowing various shades to be produced in the impression using only one plate and a single ink colour. A similar effect can be seen in aquatint but there are differences between the two techniques. In mezzotint, the layers of ink and the gradations in thickness are continuous whereas with aquatint the thicknesses vary according to how deeply the plate is bitten. In addition, the size and number of white unbitten dots in aquatint, absent in mezzotint, also determine the shade of the colour – the larger and greater the number of dots, the lighter the hue.

Apart from black, *sanguine* and brown inks were also used for the monochrome printing of eighteenth-century French crayon engravings to reproduce the original crayon drawings closely (Fig. 276). Brown was popular in the second half of the eighteenth century and early nineteenth century for printing aquatints and dotted plates, which combined well with the brown ink for the reproduction of washed ink drawings (see Fig. 190, p. 213).[828]

Polychrome printing

The printing in intaglio of two or more colours together in order to create one image appeared in the sixteenth and early seventeenth century using the following methods: simultaneous printing of different colours from one plate in one run (printing *à la poupée*); parallel printing of different colours from two or more plates (jigsaw-plate printing); and serial printing of different colours from two or more plates (printing *au repérage*).

Printing à la poupée
In this technique two or more colours are applied on one plate. The different adjacent areas of the plate are inked with different colours that border each other and never overlap, although they might mix. The plate is printed in one run and the impressions show all the colours next to each other contained within the edges of the plate. The term *à la poupée* is named after the dolly (*poupée*) made of a rolled piece of rag used in inking; one dolly is used per colour.

Early examples
The oldest known example of *à la poupée* printing is Agostino Veneziano's engraving of *The Madonna Adored by Saints of the Dominican Order* (c.1525) in which the Virgin and Child are printed in red with the remainder of the illustration printed in blue (Fig. 277).[829] The plate was clearly printed during Veneziano's lifetime because the finely engraved lines have not yet worn. The application of the colours is neat but not as refined as the *à la poupée* printing found from the late seventeenth century onwards. The function of the colour composition can only be speculated but seen from some distance the glowing red of the Virgin and Child draws one's attention. In combination with the (now removed) dark frame, creating a perspective effect, it is not difficult to imagine that this type of coloured print could be pasted onto a panel such as was used for a family altar to act as a focal point for personal meditation.[830]

More specimens of *à la poupée* printing are found in the following period. For example, Wendel Dietterlin's first volume of his book *Architectura* containing architectural designs appeared in 1593, the second in 1595. Both volumes have etched title plates, each with two small text plates cut out of the main plates. In both cases the lower, small text plates were inked in red and black. In the title plate of the first book the division is simply red above and black below (Fig. 278). The *à la poupée* printing in the title plate for the second book is more particular because the plate was inked in red with a dash of black for the hatching to indicate the shadow created by the hand of the figure on the left (see Fig. 13, p. 13).[831]

A copy of Heinrich Zeisingk's book on engineering has the etched title page of the first part (1607) printed *à la poupée* in green, black and violet inks (Fig. 279). Here the colouring is straightforward and has no other function than to indicate the different parts of the title in an appealing way.[832] At least one etching by Hercules Segers (HB 16, 1620s) was printed *à la poupée* in greyish blue (above) and greyish green (below) (Fig. 280).[833] The application of *à la poupée* colour printing is modest in all the above cases, suggesting limited experience of this working method.

Johannes Teyler and followers

The *à la poupée* prints produced from 1688 onwards display more professionally inked plates as seen in the colour prints from some 300 plates produced in Johannes Teyler's workshop from 1688 to 1698. Birds and butterflies, vases, architecture, mythological scenes, battle formations, town views and landscapes were printed in bright colours on fairly thick white paper with good results (Fig. 281).

Teyler was an engineer by profession, not an engraver or plate printer.[834] It was probably as a businessman or entrepreneur that he was granted a privilege for 15 years by the Staten van Holland en West-Friesland for his new method of printing on paper, parchment and textile on 20 February 1688.[835] His workshop flourished for 10 years but there are only a few contemporary references to his printing activities, apart from the printed objects themselves.[836] Teyler went to Berlin in 1697 and the workshop was closed by early 1698.[837] The complete inventory including printing equipment, copper plates, printing presses, plaster casts as well as printed textiles were auctioned in Rotterdam on 26 March and 22 May 1698.[838]

Teyler was in contact with the draughtsman Jan van Call who, like himself, was a native of Nijmegen living in The Hague at the time while Teyler's house and workshop were located in nearby Rijswijk (Van Call later moved to Amsterdam). Furthermore, Teyler was in contact with the artist Martinus Berkenboom, also from Nijmegen and also living in Rijswijk by 1692.[839] Jan van Call cooperated with the Amsterdam publishers Carel Allard, Gerard Valck and Petrus Schenck; the latter two acquired a patent (*Octrooi*) from the Staten van Holland en West-Friesland to print plates in black and in colours that was granted on 24 September 1695.[840] They started publishing volumes of landscapes and townscapes printed *à la poupée* in the same year.[841] The artist and traveller Cornelis de Bruin published abundantly illustrated volumes on his travels in Greece, the Near East and Egypt in 1698 in a Dutch and a French edition.[842] One copy of each edition was illustrated with all the plates printed *à la poupée*.[843] De Bruin showed both copies to the Von Uffenbach brothers, keen innovators, during their visit to Amsterdam on 24 March 1711.[844]

Dutch *à la poupée* prints, like those published by Teyler's follower Gerard Valck, lack the refinement in inking and the brightness of Teyler's prints. The colouring is more simplistic: the walls are brown, the roof tiles orange-red, the trees green, jackets red and the skies are blue. These prints are also completely filled with colour whereas most works from Teyler's printshop depict isolated figures with enough empty white space left around the figures to enhance the quality and effect of the colours.

Here we see a difference in function. Teyler introduced colour-printed textiles and his extant prints on paper originate from bundles that were probably sample books from his textile printing shop. Furthermore, he did not publish editions other than printing some more copies of the plates, often inked in different colours.[845]

The first of a series of *à la poupée* prints issued by the book and print publishers Allard, Schenck and Valk before 1700 included title pages, introductions and indices.[846] Single prints or small series printed *à la poupée* appeared later, such as those from plates by Pieter van den Berghe, Abraham Blooteling, Jacob Gole, Willem Swidde and Frans van den Wyngaerde (Fig. 282). These engravers were probably not involved in the colour printing themselves (Van den Wyngaerde, for example, was already dead by then). The inking of mezzotint plates by Gole, Van den Berghe and others is bright, but also rather coarse and missing detailed colouring.

Dissemination of à la poupée printing

The method of *à la poupée* printing was soon adopted by other countries.[847] Charles Cochin was the first to give a technical description of this method. In the third edition of Bosse's treatise of 1745, he explained that the various browns should be inked with a dolly (*petit tampon*) for each hue.[848] In comparison to Jacque Christoph Le Blon's technique, discussed below, he found that this made it much easier to copy a painting. Le Blon himself had already considered that it might be useful to apply extra colours to the plates in his three- and four-colour printing system.[849]

In England, the process was published by Robert Laurie 'aged 20' (he was actually only 18), who sent a short description of his manner of *à la poupée* printing to the Society for the Encouragement of Arts, Manufacture and Com-

merce. His letter is dated 'Nov. 6, 1776', but was not published until 1784 in the second volume of the Society's *Transactions*.[850] Laurie's description, which is correct albeit rather simple, is quoted here in full: 'The plate being warmed in the usual manner, the colours are applied by means of Stump Camel hair Pencil, to the different parts, as the subject suggests; it is then wiped with a coarse gauze Canvas, any other being improper; after this it is wiped clean with the hand as in common practice; and being again warmed, is passed through the Press.'

Printing dotted engravings and etchings *à la poupée*, popular in England in Laurie's time, became more sophisticated. First the plate was fully inked in a shade suitable for the design or picture being reproduced. This ink was wiped almost completely out of the grooves, after which the various colours were applied very precisely. Area by area was carefully wiped to prevent the inks from mixing, the plate was wiped by hand, and finally printed. The plate had to be cleaned and prepared again, and the whole process was repeated.[851] Printing larger mezzotint plates thus became rather time-consuming reaching a point where only a few impressions could be pulled per day, with the risk of noticeable differences between the proofs in the edition and thereby loss of proofs.[852]

Jean-Baptiste Audebert's publication on humming birds, *Oiseaux dorés ou a reflet metalliques*, appeared in 1802. Its two volumes set a new standard in ornithological works. All the plates were printed *à la poupée* in their natural colours with hand-colouring added for details such as the birds' irises (Fig. 283). The majority of the 190 illustrations are overprinted with a base colour – made of an oil varnish ground with perhaps yellow ochre – from a second plate (indicated by the visible pinhole registration marks), upon which gold leaf was applied to simulate the sheen on the birds' feathers. This high quality technical production was completely new and had never been carried out before, as was duly advertised.[853] The names of the birds are engraved in the plates underneath every figure, 200 copies of which are printed using an ink made from oil varnish mixed with gold powder while in another 100 copies the captions are printed in black.[854]

Some printers refined the technique by using different black inks of various consistencies on one plate. As Frank Short (1888) observed: 'large plates are sometimes filled in with many different kinds of [black] ink, to give different qualities, and even suggestions of colour, to different parts of the proof'.[855] *À la poupée* printing was used during the flourishing of colour printing in France in the 1890s, but seemed to have been almost forgotten in England.

Jigsaw-plate printing

The simpler version of multiple-plate printing involves printing from two or more plates placed next to or within one another on the bed of the press and printed in one run, practised from the mid-fifteenth century onwards (see Fig. 211 above).[856] The manner of producing print series by means of printing two plates on one sheet of paper is discussed above.[857] This practice gave printmakers the experience they needed for printing two conjoined plates to create one image. One larger plate is cut in several pieces that are inked separately, joined on the bed of the press and printed together in one run. An image made in this manner is known as a 'jigsaw print' or 'puzzle print'.[858] Typical of impressions printed using this method is a white rim with a raised embossment between the plates.

Early, if not the earliest, examples are the nine plates of *The Round Passion* by Lucas van Leyden dated 1509 (Fig. 284). All nine circular plates are printed together with a separate ring-shaped bordure plate, ie every one of the nine plates is printed with the same bordure plate around it.[859]

Jigsaw-plate printing was practised in Antwerp from 1570 on.[860] Later, Antwerp engravers introduced the manner into Germany where it was used in particular for portraits with decorated borders.[861] All the plates of the Antwerp and Antwerp-influenced multiple-plate prints are in black, but this is just one step removed from inking the different plates in different colours. In the German translation of Nicolas de Nicolay's journey through Turkey, published in 1572, it can be seen that the etched title page was printed from a jigsaw plate that consisted of two plates, the one inserted within the other. The outer rectangular plate is a decorated border printed in black, while the inner oval plate contains the text and was printed in red (Fig. 285).[862]

Wendel Dietterlin's two-volume *Architectura* has already been mentioned in relation to *à la poupée* printing, in which both title plates were printed from three combined plates (see Fig. 13, p. 13 and Fig. 278).[863] Jigsaw prints in two colours appear more often after 1600. For example, a set of illustrations in the *Peristromata Turcica* (1641), a political pamphlet of the time, has all seven plates printed in red for the carpet and black for the insert, or vice versa. One copy of the pamphlet has its title plate printed in red and blue (Fig. 286).[864] In 1739 John Pine carried out a more ambitious project with a print series depicting the tapestry hangings illustrating the defeat of the Spanish Armada (1588) in the House of Lords, the inner plates being printed in green and the borders in black ink.[865]

A variation on this technique involves placing a smaller plate on top of a larger plate. Usually the lower plate has an engraved border only with a blank middle part. A second, thin plate is placed on top of the lower plate and the whole run through the press together.[866] Typical of this technique is the unprinted rim with diffuse edges around the embossed upper plate, and it is used when the same plate is employed with different text or portrait inserts.[867]

Printing *au repérage*

When printing *au repérage*, impressions of two or more plates are aligned and printed on top of each other on the

same sheet in consecutive print runs to create one image. The technique first developed for colour intaglio printing in the seventeenth century. Knowledge of the sequence of printing is important as this determines the particular hue: blue over red looks different from red over blue. Another important issue is the choice of colorants, as some are opaque while others are more transparent. Adding more oil varnish to the ink creates greater translucency but the amount that can be mixed in is limited because of its influence on the behaviour of the ink.

Most modern printmaking manuals give prescriptions for aligning the different plates for *au repérage* printing.[868] Often, however, the registration technique used for a colour print cannot be discerned in the print itself, either because the plate or paper does not contain any registration marks or the marks were cut off when the paper was trimmed. Because of the rarity of the earliest objects printed *au repérage*, more technical details are given here.

The easiest method is to mark the position of the plates and the paper on the bed of the press. The first plate and the paper are placed in their proper positions and the whole run through the press until only the farthest edge of the sheet remains beneath the top roller. The blankets are thrown back over the top roller and the paper is lifted and turned over on the blankets. The plate is removed and the second plate placed in the same position. Because the edge of the paper is caught under the top roller it remains stationary and can be placed back on top of the second plate in the same position as in the first run. The blankets are placed on top, the second run is made, and the process continues in this way until all the plates have been printed.

Some registration methods work better than others, but the general problem is paper stretch that causes imperfect alignment of the colour areas. This is unavoidable because the paper needs to be damp during printing to make it sufficiently soft and pliable to enable it to be forced into the grooves. However, damp paper also stretches in the direction of the movement of the bed when the plate and paper are run through the press. This problem can be reduced by passing the paper through the press in advance of printing in order to stretch it, thereby limiting further stretching during the actual printing. Another possibility is to make the second plate a little larger than the first to compensate for the difference in stretch between the first and the second run. Nevertheless, it is virtually impossible to prevent paper from stretching. An intaglio colour impression printed *au repérage* will therefore always show small differences in registration between the different colours of one particular area.

Historical developments

The history of *au repérage* colour printing imagery goes as far back as the multicolour printed woodcut illustrations produced by Erhard Ratdolt, which were based on Gutenberg's typographic printing in red and black.[869] Ratdolt published a book with six red and black/yellow and black diagrams and one in red, yellow and black in Venice in 1485.[870] This was followed by a four-colour image printed in Augsburg in 1487[871] in which every colour was printed from a separate woodcut block, with the colours printed both adjacent and partly over each other. By the first decade of the sixteenth century this developed into the *chiaroscuro* woodcut.[872]

Chiaroscuro printers were skilled in the technique and even in the early stages, from about 1530, colour-printed woodcuts were being overprinted with an engraving or etching. In other words, engravings and etchings were sometimes printed together with tone blocks for the background colours. The woodblocks supplied the coloured background tones, the intaglio plate the fine details of the image in black (see Fig. 297).[873]

The printing in register of colour intaglio plates is only seen a few times in the seventeenth century – no continuous development can be observed – and only two instructions for *au repérage* printing were published by Bosse. However, these prints and instructions may have inspired later engravers and printers and encouraged the developments in the eighteenth century.

Heinrich Zeising

The first true intaglio *au repérage* print found is the title page to the fourth part of Zeising's *Theatrum machinarum* (Leipzig 1613).[874] This title page is compiled of two etched plates, one with the imagery and decoration printed in black, which is overprinted by the text plate in red (Fig. 287).

Hercules Segers

Some sixteenth-century engravings and etchings were printed with black ink on blue paper and heightened by brushing with white watercolour.[875] Hercules Segers went further by also printing the white highlights, as can be seen in a small print of a rocky landscape (HB 25 Ib) of the 1620s (Fig. 288). He first printed an etching plate in black on blue prepared paper, which he overprinted with an etching plate in white.[876] The print is trimmed within the platemark but no registration technique is discernable.

François Perrier

François Perrier developed a method similar to that developed by Segers around 1632–1635. He produced a number of black and white prints for which he printed two etched plates – one for the black lines, the other for the white highlights – in register on grey or brown-grey paper (Fig. 289) possibly with the intention of imitating *chiaroscuro* draw-

ings. Although Perrier had no followers, Bosse explained Perrier's technique according to his understanding of it as follows.[877] First the black plate is etched and printed, the second plate is ground and the impression in black counterproofed on top of the ground. The second plate is drawn and etched accordingly. The black plate is printed and the paper left to dry thoroughly for 10–12 days. It is dampened again, placed on a blanket lying on the bed of the press, the white plate is positioned face down within the platemark of the black plate, covered with more blankets to prevent the plate from curving and the whole run through the press.[878]

Counterproofing is possible, although other transfer techniques work equally well.[879] The sequence of printing is also correct – the whites are voluminous and are not flattened as would occur if the white plate was printed first. The registration technique described by Bosse, however, is questionable. The verso sides of the impressions I have observed show two crayon lines crossing the shorter sides of the platemark, one in the middle of each side. Two ink lines run from the long sides of the platemark inwards, one in the middle of each side. This may be explained as follows.

The ink lines would have been drawn before the first plate was run through the press: the plate is laid face up on the press, its position marked on the bed of the press and the plate covered by the printing paper; two ink lines are drawn from this sheet onto the bed of the press, thus marking the position of the paper and the whole run through the press printing the black lines. For the white highlights the second plate is placed within the markings of the first plate on the bed of the press; the paper is placed on top of it with the ink lines on the paper and the bed of the press aligning. The function of the crayon lines is not well understood, but perhaps a soft crayon was drawn over the plate marks to see and feel whether the second plate fitted inside of the embossment of the first plate.

More *chiaroscuro* printed etchings were produced later but not in the style of Perrier. A series of Virtues etched by Bosse in 1636 and originally printed in black is also known in a black and white version, but it is not certain whether he supervised the printing of the additional white plate. [880] One black and two white plates were printed on brown paper to create a St. Paul, etched perhaps in the second half of the seventeenth or beginning of the eighteenth century. The plates were of different dimensions and the print exhibits three platemarks.[881] A further example of intaglio *chiaroscuro* printing is a *St. Roch Praying during Pestilence* etched by Johannes Glauber (called *Polidoro*) around 1720. The first state is printed in black on blue paper, with a second plate in white for the highlights.[882] One other copy on blue paper has the highlights printed in gold.[883] The impressions observed show double plate marks with traces of either white or black ink; no registration marks are discernable. White and gold lines respectively are printed over black lines. The black and the white combine well to create one convincing design but the black plate alone looks incomplete. Later states are known in black only and have extra lines added.

Abraham Bosse
The earliest documentation of a colour printing technique can be found in a patent (*Lettres patentes*) granted to Abraham Bosse and Charles de La Fontaine for printing engravings and etchings in colours on textile, parchment and paper, dated 6 January 1637.[884] The patent itself does not give any practical details, but Bosse published a description of the method in his 1645 manual.[885] He described the printing with two plates as follows: a drawing is etched on the first plate; an impression is made and counterproofed on the second ground plate; the outlines are traced with an etching needle and the plate etched only for a short time. This second plate is printed, the prints dried and then coloured by hand using the outlines as a guide. A coloured impression is moistened again, laid face up on the blankets, the first plate is laid within the platemarks of the impression of the second plate, the whole covered with blankets (as Bosse suggested for Perrier's method) and then run through the press.

Jan van de Velde IV
Although Bosse gave two different descriptions for making colour prints, he is not known to have produced any colour printed works.[886] A few decades later, Jan van de Velde IV printed the portrait of an old man in red from one plate and the rest of the image in black from a second plate on white paper (Fig. 290). This may be the first example of reproducing a flesh colour by means of intaglio printing. The red and black etched lines and roulette structures, together with the white of the paper, form composite hues in the face of the man and emulate flesh colour and shades.[887]

At the four edges of the platemark 2 × 6 indentations for the registration of the two plates are visible, all of them filled with either black or red ink. In each plate two holes are cut into both the top and bottom margins and one hole is cut in the middle of the left and the right margin respectively. The black was probably printed first and the red second – folds in the margins produced in the printing move away from the platemark of the red plate; they would have been flattened had they been overprinted with the black plate. The indentations were marked on the wooden bed of the press and small nails hammered into the bed, protruding a little less than the thickness of the plate. The black plate was positioned within the six nails, a sheet of paper laid on the plate and the first run made. The printer then turned back the blankets over the top roller, followed by the paper, or, if the paper was too small, he may have placed a heavy weight on one side of the paper and lifted this. Next he removed the black plate, fitted the red plate in between the six nails, returned the paper and the blankets, and made the second run. If the paper needed to be dried in between the runs its position could be marked on the bed of the press.

In all the above cases, with the exception of Bosse, the processes do not seem to have been communicated. This is indicative of engravers' isolated working habits; printing *au repérage* was certainly not common practice. Although Bosse explained his method in his 1645 manual, none of his prints, or any others, produced in this manner are recognised (the bi-coloured series of Virtues is questionable). The technical description is easy to understand but perhaps the technique was not found effective enough by readers of his treatise. All known examples of multiple-plate intaglio printing up to that point in time do not extend beyond working in the manner of *chiaroscuro* drawings. Critically there was no theory developed to support colour printing.

Although experimental and isolated, these works are still of importance to the development of colour printing. They represent the many efforts made to express and put into practice what was technically understood, but a further step was necessary before satisfactory aesthetical effects could be achieved.

Printers understood how to overprint texts, blocks or plates. Every painter and printer knew how to mix colours: blue and yellow for green, red and yellow for orange and so on. The skill in colour mixing was to find the correct proportions to be mixed to achieve the desired colour. Mixing coloured inks was the most direct means of creating a print in the required shades.[888] Printing two or more plates on top of each other allowed transparent colours to be used, the lower one shimmering through the top one and underneath the colours of both the reflecting white of the paper – comparable to glazing in painting – in order to create a combined hue. This technique produced intermediate colours and offered various possibilities for new results and aesthetics.

Jacque Christoph Le Blon[889]

More serious efforts demanded a determined personality to achieve true colour printing. Jacque Christoph Le Blon developed his multiple-plate colour printing system from about 1702 when he arrived in Amsterdam from Frankfurt am Main (see Fig. 3, p. 5).[890] Le Blon's original intention was to reproduce oil paintings. His colour process had the further advantage that it lent itself well to the rendering of anatomical subjects. Le Blon himself gave two excellent examples and his pupils Jan Ladmiral, Jean Robert and in particular Jacques-Fabien Gautier-Dagoty explored its further possibilities.[891] Cochin was of the opinion that Le Blon's process would suit still lifes of plants and fruits as well as anatomical subjects. However, he found the process too difficult for rendering human skin, nor was it suitable for certain kinds of landscapes and historical subjects.[892]

Intaglio printing inks are slightly transparent because the grain size of the pigment particles dispersed in the oily medium allows light to pass through the thin ink layers and reflect on the white paper, mixing with the light reflected from the pigment particles. The hue of an intaglio colour ink can therefore also be regulated by the percentage of binding medium in the ink, by using smaller or larger pigment particles, or by printing thicker or thinner layers of ink; more medium, larger pigment particles and thinner layers make the ink more transparent and thus give a lighter shade. Note that some colorants produce more transparent inks and others more opaque ones, while pigment mixtures create opaque inks.

By printing coloured ink layers over each other – more precisely by printing layers of unmixed transparent blue, yellow and red inks on white paper on top of each other – continuous colour gradations are formed. Le Blon worked as a painter of miniatures in Amsterdam from before 1705 to 1718 while developing his technique. He discussed the subject of quantifying shades in painting human skin with Lambert ten Kate and Hendrick van Limborch in the period 1706–1712,[893] and his work on colours in printing is mentioned in their correspondence.[894] The brothers Von Uffenbach, who had been told about Le Blon's technique of making prints appear like paintings in miniature, visited him in Amsterdam on 11 February 1711. He showed them a penitent Mary Magdalene printed in colours on parchment, which they thought was unrivalled. However, they had no idea of how it was made and Le Blon did not reveal his secret.[895]

In the period that Le Blon was in discussion with Ten Kate and Van Limborch he developed a colour theory for painting (white) human skin, or flesh colour (*incarnaat*), an indispensable skill for all painters. He published this in his book *Coloritto* (1725), in which he stated that all visible objects could be painted with the three 'primitive' colours – yellow, red and blue, what we now call the three 'primary' colours. He made it clear that he was discussing '*Material* Colours, or those used by *Painters*'. Le Blon stated that when yellow, red and blue 'paint' are mixed in particular ratios, 'black' or any other colour could be made. However, when '*impalpable* Colours, that cannot be felt' (ie coloured lights), are mixed, you 'will not produce *Black*, but the very Contrary, *White*'.[896]

It is often said that Le Blon merely followed Isaac Newton's research, but this is a misconception.[897] Newton discussed the behaviour of light and not the mixing of paints. Staying close to Aristotelian tradition, he divided white light into the known seven colours of the rainbow,[898] plus an area 'E' between red and orange. Le Blon reduced the available palette to three basic colours whereas Newton made no mention of mixing the three primary colours and did not postulate a three-colour theory, either for light or for paint.[899] A three-colour theory for light was first proposed by Thomas Young in 1801.[900]

Important to our discussion is that Le Blon converted his theory into practice. From his painting experience he worked out a method of printing with three mezzotint plates in blue, yellow and red (in this order) over each other in

order to create a full colour print. Practice often proves more difficult than theory, so he also had to find pigments and dyestuffs that suited his printing process. He needed materials that were both intense in colour as well as transparent, the best of which he found in deep Prussian blue, bright yellow from Persian berries (*grain d'Avignon*) and purplish red made of cochineal lice mixed with brazilwood.[901] Perfect it was not – his process required an extra black or blue plate for deepening the shades. This went against the principles of his system and the black affected the brightness of the other colours. The black or second blue plate had the advantage, however, that it improved the appearance of the image and made a longer print run possible. Later in his career Le Blon also added a fifth, white plate for the highlights. His last apprentice Jean Robert wrote that if the coloration of a painting was too difficult to copy with four plates, Le Blon used one or two extra plates, giving a total of five or six plates.[902]

The yellow and red dyestuffs Le Blon used for the brilliant and transparent colour inks faded, while the oil leaching from the ink browned the paper and dulled the colours over time. But his manner was as close as he could get with the materials available to him and freshly printed his works must have awed the public, as evidenced by the entry in Von Uffenbach's diary of 1711 and reported 10 years later by the editor of the *Mercure de France*.[903]

Le Blon's method of aligning plates correctly has been used in printing *au repérage* ever since. Two or four holes were drilled into two or four corners of the plates, all of which were of equal size (Fig. 291).[904] Two or four metal pins were hammered into the wooden bed of the press until they protruded a little less than the thickness of the plates. The plates were placed on the bed of the press one after the other with the pins fitting in the holes. The embossment of hole-and-pin in the print allowed the paper to be placed on the second plate in exactly the same position. The sequence of printing was blue – yellow – red.[905] A black plate could be printed first, the blues could be strengthened with an extra blue plate and another plate with details in white could be printed on top of the colours.[906]

With Le Blon's technique, colour printing moved forward into modernity. Four-colour intaglio printing was further refined in the eighteenth century and introduced in other graphic techniques in the nineteenth century. From the modern printing industry to digital desktop colour printers and image processing software – all are based on standardised colour separation in red, yellow and blue, with black added when needed.

Jacques-Fabien Gautier-Dagoty

After Le Blon's death in 1741, one of his apprentices, Jacques-Fabien Gautier-Dagoty, tried to claim that he was the inventor of the additional fourth, black plate. The claim was disputed and Le Blon was defended by Jean Robert, another of his apprentices, and by Antoine Gauthier de Montdorge. De Montdorge had visited Le Blon as a member of an official committee of the Academie des Sciences to check his claim for a royal privilege in 1737 and had compiled a report on Le Blon's demonstration to the committee.[907] The result of the dispute was a long polemic in the *Mercure de France*, which the editors found so tedious that they eventually stopped publishing Gautier-Dagoty's letters.[908] The polemic ended in 1756 with De Montdorge's republication of the text of Le Blon's *Coloritto* with additional detailed descriptions of his working methods taken from the 1737 report to counter any further claims against Le Blon's work.[909]

The value of Gautier-Dagoty's letters is that they show an illustration of his colour palette and explain his working method (Fig. 291).[910] This information as well as observation of his prints makes clear that Gautier-Dagoty lacked Le Blon's theoretical background, his refinement of detail in the preparation of the mezzotint plates, his choice of brilliant inks and his precision in balancing the colours.

Gautier-Dagoty compensated for his lack of Le Blon's talents by preparing large plate formats, a practical approach, and the numbers of colour prints he and his sons published. For example, in the choice of basic colorants Le Blon prepared a transparent bright yellow made from Persian berries (*grain d'Avignon*), which suited his method well although he was aware that the dyestuff was fugitive. The yellow ochre Gautier-Dagoty advocated is not transparent and bright but opaque and dull but has the advantage that it is lightfast.[911]

Gautier-Dagoty's plates may be big but they lack sharp details. The prints appear out of focus because the rocking is coarse, they lack brightness and often the printing paper is yellowed due to the oily inks he used. This is especially visible with large plates; his smaller prints have better aesthetic qualities. Le Blon seems to have planned projects on anatomy while working in London, but he completed only one anatomical plate.[912] Gautier-Dagoty on the other hand published a number of plates and books on human anatomy illustrated with the process, although their value for medical science was modest due to the absence of detail and the fuzziness of the plates.[913]

Louis-Marin Bonnet

There was a strong interest in reproductions of drawings and watercolours by the middle of the eighteenth century, which witnessed the invention and development of a number of tonal and crayon intaglio methods.[914] Combined with the multiple-plate printing developed by Le Blon and his followers, colour merged into the new processes, thereby creating flawless reproductions in tone, structure and colour.

Louis-Marin Bonnet, a pupil of Jean-Charles François and Gilles Demarteau the Elder, continued to develop the crayon methods of his masters.[915] His *chef d'oeuvre* is a *Tête de Flore* after a pastel drawing François Boucher made of

his daughter Marie-Amélie made in 1757. The print was pulled from eight plates in eleven colours (Fig. 292). Bonnet offered a volume with successive proofs of the eight plates to the Marquis de Marigny, who in turn presented it to King Louis XV.[916] The eight proofs showed Bonnet's system of building up a full-colour reproduction of a pastel drawing, printing monochrome and *à la poupée* inked plates over each other. Descriptions of the colours used for the plates and their effects were reproduced on the opposite pages on the left.[917] With every new proof another colour was added: the first proof was printed from the first plate, the second proof was the first proof overprinted by the second plate, and so on, and the final eighth proof had all plates printed on top of each other to create the complete picture.

The actual order of Bonnet's printing of eight plates in eleven colours was described in the text accompanying the plates.[918] The first plate was printed *à la poupée* in green (green verditer or a mixture of blue and yellow) and blue (probably Prussian blue); the second was in a flesh colour, a mixture of red lake (kermes?) and carmine (cochineal red); the third was in dark blue (probably Prussian blue); the fourth was in a 'tender' (thin, transparent?) red lake (kermes?) for the skin, with green and yellow (Persian berries, orpiment?) for the flowers that are printed *à la poupée*; the fifth was printed in a brown made from powdered 'petrified wood' (*bois pétrifié réduit en poudre*, perhaps Cassel earth?), because the common brown pigments (bistre and earth browns) had a dull and opaque effect; the sixth plate was printed in carmine only; the seventh was printed in an undefined dark brown; and the eighth and last plate was printed in white.[919]

Not only was the use of so-called 'petrified wood' Bonnet's invention but also the type of white. The whites in Bonnet's prints have survived rather well with no significant yellowing and certainly no darkening. He mentioned the yellowing and the blackening of the 'whites',[920] by which he meant white ink or white pigment. Yellowing of white ink made with lead white is due to the oil varnish in the ink turning brown, while darkening is due to lead white pigment becoming grey.

Bonnet is rather particular about the white he used. He stated that he found a white that did not have these inconvenient properties and that served to give the 'finishing touch' to his work. Bosse recommended sun-bleached walnut oil as a means of preventing the white ink from yellowing.[921] Bonnet would have known Charles-Nicolas Cochin the Younger's edition of Bosse's treatise and the reference to Perrier's *chiaroscuro* prints. He was a protégé of the editor of the third and the fourth editions of Bosse's treatise, who was obviously well acquainted with its contents.

It is possible that Bonnet used the pigment zinc oxide, better known as 'zinc white', instead of the common lead white. Zinc white does not darken but oxidises to other compounds that are also white, such as zinc carbonate or zinc sulphide. Zinc white and zinc carbonate are known from early historic sources but were not used as pigments then. Synthetic zinc white was documented in 1782 and the possibility that it was available before that date is open to further research.[922]

Bonnet extended Le Blon's method by adapting it to pastel drawing, which demands more opaque colours. Bonnet's manner of printing layer upon layer was similar to the way a pastel is built up, such as the flesh colour that is printed on top of a green base. Le Blon's true colour separation was more scientifically based, although he had to adapt it in practice by adding a black and a white plate, even using *à la poupée* printing on occasion. Le Blon chose transparent layers using the white of the paper as a 'back light'. Bonnet piled up ink layer upon layer until the desired result was achieved, relying largely on the light reflected by the inks.

François Janinet

Le Blon's mezzotint technique being too demanding, French intaglio colour printers followed Bonnet's direction, continuing on his crayon engraving techniques and merging them with the fashion for aquatint (not aquatint itself). They worked the plates with fine-textured roulettes only superficially and the impressions from those plates with their large semi-transparent colour fields resemble aquatints. Textures can only be observed using a magnifying glass. The white dots visible in aquatints are missing. Glazes of bright colours replaced the heavy layers of coloured inks typical of crayon engraving and mezzotint.

François Janinet, one of Bonnet's pupils, was the first to work in this new method. Refining the crayon engraving technique he had learned from Bonnet, he made its structures appear more transparent and combined it with Le Blon's four-colour printing method. The first plate produced in this way in 1772, when he was only 20 years old, was *L'Operateur* after a drawing by Paul Benazech.[923] The legend to the plate reads: *gravé à l'imitation du lavis en couleur par F. Janinet, le seul qui ait trouvé cette manière*. He, and his followers, thereby succeeded in creating almost perfect reproductions of colour-washed drawings (see Fig. 4, p. 5). The remarkable series *Portraits des grands hommes, femmes illustres, et sujets mémorables de France, gravés et imprimés en couleurs* (Paris 1786–1792), a publication with 192 French histories and portraits, was produced in this manner and printed mainly in four colours (red, yellow, blue and black) from four plates.

Dissemination of colour printing

Colour printing using *au repérage* methods was practised in central and western Europe outside of France only occa-

sionally throughout the rest of the eighteenth century and early nineteenth century, the majority of coloured works being printed monochrome, sometimes *à la poupée*. After Le Blon, the first to print in colours in the Netherlands was Cornelis Ploos van Amstel Cz., whose employees produced a series of facsimiles of drawings. Some were printed from two plates in red and black which, in combination with his transfer technique, gave true facsimiles of drawings *à deux crayons* (Fig. 293). A *Sitting Farmer with a Jug* (1763) after Adriaen van Ostade was printed from four plates in various colour combinations.[924]

Ploos van Amstel's enterprise remained singular in the Netherlands. Only a few other engravers produced colour prints, but they never used more than two plates.[925] Some English and German engravers printed two colours from two plates.[926] Around 1800 the Chalcographische Gesellschaft in Dessau was active in publishing high quality prints of drawings and paintings, among which were some colour prints printed from four plates.[927] Colour printing was introduced in the Austrian states by Tranquillo Mollo in 1800 or 1801.[928]

Le Blon had a further talent in that he was able to separate a mixed painted colour into its three primary colours by observation only.[929] This is another reason why his three-colour and four-colour systems did not become popular: only a few others were capable of doing this properly. The principle of colour separation was kept alive through the many publications mentioning or describing Le Blon's method, though, and occasionally attempts were made to apply it. Gautier-Dagoty and his five sons based their working practices on Le Blon's method[930] and Le Blon's apprentices, Jan Ladmiral and Jean Robert, produced works using his technique (Fig. 294). The last engraver to use Le Blon's technique was Carlo Lasinio, a prolific Italian engraver.[931] Edouard Gautier Dagoty, one of the sons of Gautier père, moved to Florence in 1783, where he made contact with Lasinio and taught him the four-colour printing process.[932]

Multiple-plate intaglio colour printing, not using mezzotint plates but a refined form of crayon engraving, thus was practised by Janinet and his followers.[933] In 1837, the French lithography firm of Godefroy Engelmann the Elder took out a patent on four-colour lithography, which was first called *Lithocolore* but later became known as *Chromolithographie*.[934] French artist-printmakers Henry Guérard, and Camille and Lucien Pissarro adopted four-colour printing again in 1885 and 1890 respectively.[935]

The search for precise three- and four-colour printing continued in the printing trade of the nineteenth century because it had proved to be the most efficient manner of colour reproduction. Although attempts were made to mechanise colour separation, it remained a largely manual operation until 1906 when the introduction of colour filters and photographic emulsions sensitive to specific colours allowed complete colour separation to be carried out photomechanically.[936] True colour printing was achieved with the cyan-magenta-yellow system, with a fourth black key plate for enhancing the darker shades (the present CMYK system). Four-colour printing was first used in the relief and offset printing industry and is now used by colour copiers and computer printers. Le Blon's concept has become a fully established technical process with modern colorants allowing almost perfect reproductions.[937]

Combination techniques

The first attempts at illustrating printed books with engravings date from the 1470s.[938] Progress was slow as combining intaglio and letterpress printing on one page remained technically complicated, requiring the organisation of two printing processes parallel to or following each other. It was also time-consuming therefore books illustrated with engravings were more expensive than those containing woodcuts.

From Christophle Plantin's publication of Juan de Valverde's *Vivae imagines partium corporis humani* (1566) onwards, the engraved book illustration became generally accepted. It was not long before woodcut was consigned to cheaper publications and engravings and etchings flourished as decorations on title pages and as book illustrations until the twentieth century. The reasons are clear – although more expensive, engraved and etched illustrations are visually more effective and look more sophisticated than woodcut illustrations. Finer textures and tonalities can be produced by means of intaglio techniques thereby offering more and better possibilities of illustrating a text.

Typography and intaglio
The main difficulty in combining typographic and intaglio printing is that the text and image have to be printed one after the other on the same page by means of two different printing techniques. Woodcut or metalcut illustrations can be printed together with the letterpress text in one run because they are relief-printing methods and require a typographic press only. Intaglio printing requires a roller press, which means that the image and text have to be aligned in printing in two runs on two different kinds of presses with the associated risk of printing the second run out of register. This was the main technical reason why so few books illustrated with engravings appeared in the fifteenth century.

But even once the techniques had been mastered, organising a book to be illustrated with copper engravings was still not that easy. Book publishers complained about slow and unreliable engravers.[939] If the engravers did not print their own plates, a plate printer had to be drawn into the project because few book printers operated a roller press or

vice versa (see Fig. 65, p. 78 and Fig. 73, p. 85). Separate contracts had to be drawn up for designers, engravers, plate printers and book printers, not to mention the financing of the project.[940] Plantin and his heirs, the Moretuses, contracted or hired plate printers until Balthasar IV Moretus decided to install a roller press in the printshop in 1714; plate printers were employed on a permanent basis from 1717.[941]

Technical possibilities

Although books illustrated with engravings or etchings are common, the techniques used in the process were never documented as far as is known. One of the unanswered questions in the history of illustrated books is therefore whether the text was printed first and then the plate, or the other way around. The following methods can be considered if it is assumed that the text was printed first followed by the engravings.

1
   The text is printed and spaces left for the illustrations. The positions of the illustrations are marked on or cut out of a sheet of paper with the same format of the text sheet; note that the positions should be marked or cut out in reverse. This sheet is placed on the bed of the roller press. The printing plates are positioned face up in their proper places, covered with a (damp) sheet with the text face down and the whole run through the press to print the plates in the spaces left open in the text.

2
   An easier method involves printing the text on one side of a sheet and the plate on the other. It was used for Lazarus Beham's *Hie fahet an eyn buch von der astronomien* (Köln: Götz, c.1476), the first example of a book illustrated with engravings.[942] Apparently it took a while before this method was used more often, such as with Domenico Lupi's *Meditationes* (Brugge: de Valle, 1503).[943] Curiously enough the 1514 publication by Ambrogio Leone concerning his home town of Nola was planned to be illustrated with engravings printed on the back of the text pages. This plan was not followed however – instead the plates were printed on separate sheets, which were usually bound with the text opposite the blank pages or sometimes pasted onto them.[944]

3
   Bosse, describing his method of multiple-plate colour printing, states that first a blanket should be laid on the bed of the press. A sheet printed with the first plate is placed on the blanket, the second plate is positioned face down on top of the paper. The whole is covered with a maculature sheet and some more blankets, and this sandwich is run through the press. The same technique could be used with a sheet of letterpress text. The plates are positioned face down on the saved spaces within the text, the whole covered with maculature and blankets, and printed. The disadvantage is that if the lowest blanket is too thick or too soft, the plate will curve immediately and strongly when run through the press and has to be flattened afterwards, which is impractical.

Printing procedures

If the plates are to be printed first followed by the text, the positions of the plates within the text have to be known in advance. This means the type has to be set ready to print and cannot be corrected or amended. A stencil can be used to print the plates in the right position on the paper, as described above. The same stencil should be used to position the type forme in the press and pin the paper on the 'points' on the frisket. Although not impossible this technique is not likely to have been used. An easier method would be to place the sheet in the proper position directly onto the printing forme, which requires registration marks for the sides or corners of the sheet.

Sometimes the order of printing can be observed. When the text is printed first and then the plate, a platemark may run through a line of text. This can only occur when the plate has indented the paper. When the plate is printed first and then the text, the type may appear embossed in the image. Note that the absence of platemarks does not necessarily mean that the text was printed later because any relief may have disappeared for various reasons.[945]

It may be argued on both financial grounds and time issues, that in most cases the text would have been printed first followed by the engraving. Printing a page of text is quicker than printing an engraving. A book printer could print 200 sides of one sheet per hour on average, ie one side of a sheet every 18 seconds.[946] Printing just one plate takes several minutes for plates the size of the palm of a hand and considerably longer for bigger formats. Printing some extra text pages to compensate for possible losses in the plate printing is easy and relatively cheap because it takes so little extra time.

The earlier printing of the text, however, complicates the registration of the intaglio printing. The paper is dampened for the first typographic printing, stretches, deforms by the moulding on and around the typeface, and shrinks again in drying. The sheet is dampened a second time for the intaglio printing and expands irregularly, both because the paper has a relief embossed into it and because the inked parts have become hydrophobic and therefore absorb less water than the uninked parts.[947]

Registration problems are avoided when plates and texts are printed on separate sheets to be joined later by the

bookbinder, as shown in Chapter 1 in the example of the Ptolemy edition by Nicolaus Laurentii (see Fig. 20, p. 26). This became a common means of joining intaglio illustrations and typographic text (Fig. 295; see also Fig. 121, p. 146).

Although instructions to the bookbinder are often found in the books, details about the binding techniques for the plates are rarely given.[948] A note to the bookbinder in the *Mozaize historie der Hebreeuwse kerke* states that two illustrations are printed on one sheet, which should be cut in half in order to insert the illustrations in their rightful places in the book.[949] Whether it concerned two copper plates printed on one sheet or one larger copper plate with two images is not clear but it is more likely to be the latter as it was common to combine several illustrations on one plate and to cut up the sheet to separate the images. To facilitate this, thin lines were engraved or etched in the plate as cutting guides (Fig. 296).[950]

Chiaroscuro woodcut and intaglio

Instead of printing in relief and in intaglio next to each other it is also possible to print one over the other. Following the first developments of *chiaroscuro* printing, line etching in black was combined with coloured planes for the background printed from one or more woodcut tone blocks.[951] The first example is *Peter and John Healing the Lame Man at the Beautiful Gate* (c.1530) by Parmigianino or his circle, which has a greyish tone block for the *chiaroscuro* effect and an etching printed over it for the lines of the design. The third state has two tone blocks for two yellowish brown hues.[952]

The most impressive work – by sheer volume alone – of its kind is the 1557 publication on numismatics by Hubert Goltzius. All of its 155 portraits have tones in *chiaroscuro* woodcut in two hues of yellowish brown with the designs printed over them in black from etching plates (Fig. 297); the choice of colours was probably to reproduce bronze and gold coins. Well known also is Abraham Bloemaert's *Tekenboek* produced by his son Frederick Bloemaert in 1650–1656 in which the function of the combination of engraved and etched black lines with yellow ochre hues printed from woodblocks was to reproduce drawings.[953] Combinations of intaglio and relief printing are found more regularly in the seventeenth and eighteenth centuries. Works by the Dutch engraver Abraham Delfos went even one step further by combining etching for the lines with *chiaroscuro* woodcuts for the grey and brown shades and letterpress text in one picture (Fig. 298).

Japanese woodcut and intaglio

Many new graphic processes were invented in the nineteenth century, but the combination of manual intaglio printmaking with another graphic technique did not develop further in Europe, if practised at all. For this we need to look to Japan where Hashimoto Chôgetsu combined line etchings printed in black with areas printed in two or three colours (delicate blues, browns and greens prepared from vegetable dyestuffs) using stencils around 1860.[954] Later in the century and up to 1900 etching was regularly combined with woodcut, with very bright purplish reds and bluish greens prepared from modern artificial colorants imported from Europe, printed over the black intaglio lines (Fig. 299).

Viscosity colour printing

Relief printing of intaglio plates is found in modern printmaking.[955] It has its roots in white line woodcuts from the fifteenth and sixteenth centuries, and William Blake's relief etchings. The simultaneous printing in intaglio and in relief from one plate takes this a step further.[956] The intaglio plate is inked and wiped as usual, then the surface of the plate is inked with a roller or otherwise, and the plate printed in one run. The print shows the intaglio lines on top of the layer that is printed in relief (Fig. 300). In a variation, the plate is printed in intaglio first, after which it is cleaned. Next the plate's surface is rolled up with a coloured ink and printed on top of the intaglio impression, although slightly out of register, which gives a stereoscopic effect.

Hayter's Atelier 17 developed a method known as 'viscosity colour printing'.[957] In its earliest form, starting from 1940, Hayter covered the surface of an engraved and etched plate, which was already inked in intaglio, with various colours by means of stencils or via screen printing (see Fig. 10, p. 9).[958] The plate was run through the press producing a multicolour print with the colours supporting the intaglio lines.

In its more mature form, the plate is specially prepared for rolling up by etching away broader and deeper areas. After inking and wiping the plate in intaglio, a roller with rather viscous ink is passed over the plate. The roller will also offset ink at the bottoms of the wider grooves. Next a second roller with a less viscous ink of a different colour is passed over the plate. The ink is more fluid and less tacky, consequently it will offset from the roller onto the plate instead of the roller picking up the stickier ink from the plate. More colours may be used in this technique, the later less viscous than the earlier layers. The plate is then run through the press. The print will exhibit three or more colours next to and on top of each other.[959]

Modern developments

In the past decades it has become popular to combine all kinds of printmaking techniques and hybrid prints are encoun-

tered regularly today.[960] By combining manual and digital techniques, for example, the modern printmaker can create an image on the computer screen with one colour per layer. The layers are not merged but printed individually on separate sheets. Each sheet is transferred onto a different printing plate, the plates processed and printed in register one after the other.[961] The historian of the print should therefore not be surprised to find different processes in one contemporaneous print. This implies that, although duplication is inherent to printmaking, first and foremost it is concerned with the image rather than the techniques used. Finally, it is the particular combination of printmaking techniques and their typical appearances which creates imagery that could not be achieved in any other way.

Hand-colouring

Although the hand-colouring or illumination of prints is not part of the printing process, there is a close relationship.[962] From the very beginning of printmaking shortly after 1400, we find woodcuts illuminated with watercolour paint, while illuminated engravings appear by the middle of the fifteenth century (see Fig. 43, p. 43).[963] Hand-colouring remained an option through the centuries and publishers offered for sale prints with or without colouring, the coloured version being more expensive.[964]

Colouring processes

Prints could be coloured by brush with oil paints or watercolours; modern techniques use an airbrush, colour pencils or crayons. Watercolour is the medium most often found, while only a few prints coloured with oil paint survive, such as those by Hercules Segers. The oil bleeds easily from the paint, soaks the (unprepared) paper and yellows it over time; the staining spoils the print's appearance and is detrimental to the paper itself. Nevertheless, hand-colouring with oil paint was sometimes appreciated. Chomel explains that the print first needed to be varnished on both sides before being coloured with (nut) oil paint.[965] In a special process, designed to make the coloured print appear like an oil painting, first transparency of the paper was achieved using oil of turpentine, then the verso of the print was brushed with oil colours and the front varnished. The following paragraphs address the application of watercolour only.

The paint was usually applied by brush, which was time-consuming, but as a result was also more profitable for the colourer. For cheaper prints produced in series stencils were used both to speed up the work and to keep the colours within the outlines of particular areas.[966] Some chalk powder was sometimes added to the paint to prevent the watercolour from spreading underneath the stencil. Chalk gives the paint body and makes it look matt and opaque, giving the paint in sixteenth-century illuminated prints a pastel-colour appearance.[967] This differs from the transparent colours that were recommended in the fifteenth century.[968] Miscellaneous materials such as mica, hay, straw, or textile clippings were pasted onto the print to decorate its surface.[969] Another technique used to enhance the appearance of prints involved creating transparency in certain areas to give the illusion of moonlight or fire when held up to the light, or to make them completely transparent.[970]

Usually, prints to be hand-coloured were printed in black, but by the later eighteenth century printing inks in other colours were also considered suitable for hand-colouring.[971] Voit (1790) observed that when plates are too deeply etched or engraved they print too black. To compensate for this, a little lead white can be added to the black to make it greyish, in particular for prints that were to be illuminated to reduce the contrast of the lines against the colours.[972] Krünitz (1792) remarked that printers tended to print plates to be illuminated in yellow.[973] He probably did not mean a true yellow, but more likely a yellowish brown, which is observed in late eighteenth and early nineteenth-century English dotted prints. Illuminated prints printed with other colours of ink are also found.[974]

A number of mostly modern intaglio printmaking manuals give details on colouring prints.[975] Historical books of recipes regularly include both etching recipes and instructions for colouring prints.[976] The first German translation of Bosse's manual contains an appendix on illumination.[977] Vice versa, in Ter Brugghen's publication on watercolour painting it was considered appropriate to fill the three blank pages at the end of the treatise with instructions for etching and printing a plate.[978] The many treatises on watercolour painting would also have proved instructive for hand-colouring prints.

Qualities in hand-colouring

In many cases we find amateurish or even clumsy colouring, which seems to have been done merely for the colourer's entertainment. This may range from a child playing with brushes and paint to adolescents who would have seen it as a pleasant though more carefully performed pastime.[979] The majority of prints were coloured by professionals, most of them anonymous labourers, who in Germany gathered as *Briefmaler* or *Kartenmaler*.[980] They commonly brushed a limited number of colours in patches on the print to enliven the black and white impression (Fig. 301).

Quality illumination reached a first peak in the later sixteenth and early seventeenth century with some German colourers even signing the prints they had painted.[981] By the nineteenth century whole families were involved in the

professional colouring of prints. Each member of the family had his or her own specialisation, painting just some particular details only in order to increase efficiency and speed up production.[982]

The developments in the printing trade of the nineteenth century, more in particular in the field of colour printing such as chromolithography, gradually made hand-colouring obsolete. The last development in colouring prints, before finally being abandoned by the printing trade, was the mechanisation of colouring by stencils by the end of the nineteenth century.[983] But the craft did not die out and the modern illumination of (old) maps and prints is still practised today.[984]

Functions of hand-colouring
The primary function of hand-colouring is supposedly to increase the 'readability' of the print, while at the same time rendering the print more attractive and therefore more saleable and at a higher price (Fig. 302).[985] Prints intended to be pasted into mediaeval manuscripts served as cheaper forms of illumination, competing with hand-painted miniatures.[986] Hand-coloured prints mounted on panel or canvas functioned as inexpensive substitutes for (wall) paintings.[987] Stuck to walls and pasted to the insides and outsides of boxes and coffers they decorated the interiors of homes.[988] Many anatomical, medical, botanical and zoological prints are coloured, the colours showing the differences between veins and arteries, or between different organs, as well as identifying species of plants and animals. Colouring was particularly ideal for globes and maps in order to denote regional borders, towns and villages, rivers and seas, forests and mountains.[989] Devotional images were often coloured by hand, and Dutch Beguines practised colouring and decorating prints as a form of meditation by the seventeenth and eighteenth centuries.[990] Finally, hand-colouring could also have an educational purpose. *De Schilderijkijker* (1824) is a series of twelve outline reproductions with only little hatching added.[991] The booklet was created for the education of children who were meant to study the paintings and their colours while colouring the plates and reading the accompanying texts.

Discussion

Printing the matrix is as much a part of the process of intaglio printmaking as engraving. In other words, it is the combination of making the plate and printing the plate that creates the eventual print, and the one cannot function without the other. Both processes also developed individually – plate-making techniques went through a series of historical high spots whereas the number of highlights in plate-printing methods is limited. Printing materials were generally available; paper, ink, press and cleaning materials developed only slowly.

Due to increasing professionalism, the making of the plate and the printing of the plate separated in the course of the sixteenth century. Plate printing became a specialisation in its own right, and at certain times and places it was even prohibited by law for the engraver to print his own plates. Continuing professionalism ensured the beginnings of the present printing industry, due to which the artist-etchers of the nineteenth century started printing their own plates again.

Colour printing is found continuously from the Middle Ages onwards, but was not attempted on any serious scale before the late seventeenth century. After that it was only because of the determined approach of Jacque Christoph Le Blon, combining theory and practice, that a major step forward in intaglio printing was made. His groundbreaking work established the base for all new colour printing methods up to the present day.

Artist-etchers of the later nineteenth century, appreciating the by then browned prints of their seventeenth-century predecessors, mixed brown toners with their black inks and printed on old paper. Modern art historians, in researching early colour intaglio printing, considered various hues of black as true colours, while actually they were looking at black inks discoloured due to browned oil medium.[992] Similarly, blue inks may turn green, and red and yellow inks turn brown due to the darkening of the varnish, with the consequent differences in aesthetical interpretations in modern studies. Technical information and analyses of the ink may elucidate matters.

The renewed interest in printmaking in the 1960s was followed by a growing concern about safety aspects, which began in the 1980s and took firm root in the 1990s. New cleaning solvents were introduced, which allowed working with the classical grounds and inks to continue. Most of the toxic colour pigments in printing inks were replaced by alternative artificial colorants of similar hues to the extent that some colours are now unavailable and are hard to make even by mixing. In addition emulsifiers are added to some brands of printing ink to make them water-soluble. Their long-term effects on the prints for which they are used cannot be foreseen at this moment in time.

The general observation is that the choice of printing materials and printing techniques determines the appearance of the freshly pulled print. A variety of deterioration processes will alter the appearance in the long term.

Notes

1

Endlich müssen wir noch den Wunsch äußern, daß man noch etwas mehr Nachgedanken auf das Kupferdrucken wendete. Diese Kunst wird von vielen denkenden Köpfen gleichsam nur als ein Nebending angeschielet. Aber sie verdiente es, daß man sie noch mehr vervollkommne; *Reinhold 1788*: 280.

2

Bosse (Paris 1645): 57.

3

This is a revised version of the introduction to *Stijnman 2001-1*. See also: Chapter 1, p. 34 and Chapter 2, p. 112.

4

See Chapter 2, p. 102 (last line).

5

For an introduction into paper chemistry see: *Bansa et al. 1980*: 1–11.

6

For an overview of historical papermaking processes see: *Stijnman 1992*: 59–70 with further references.

7

Paper fibres are strings of fibrils that are built up of long chains of cellulose molecules. Water is a small molecule that is polar – it has a plus and a minus pole, somewhat like a magnet. The cellulose molecule also has many minus poles that attract the plus poles of the water molecules. Most other liquids do not have this property (or if they do it is negligible) and consequently do not cause paper to swell. With thanks to paper conservators Bas van Velzen and Charlotte Wolff for information on the physics and chemistry of paper.

8

The engravings by Albrecht Dürer and Lucas van Leyden show a preference for printing papers that tend to be somewhat thinner and more supple than papers used for printing woodcuts; *Landau & Parshall 1994*: 21, 314, 405; *New Hollstein Dutch & Flemish* (Lucas van Leyden): 19.

9

Bosse (Paris 1645): 69, 72, 74.

10

Studying the watermarks in Rembrandt's prints confirms that his paper came from France, southern Germany and Switzerland; *Biörklund 1968*: 168; *Laurentius 1992*; *Schneider 1990*: 263–281. For the import into the Netherlands of French paper later in the seventeenth century see: *Van Veen 1982*: 155.

11

Landau & Parshall 1994: 381 n. 167 with reference to *Wilkinson Zerner et al. 1990*: 44–45, but not found there. *Reed & Wallace 1989*: XXXII–XLIII.

12

Diderot & D'Alembert 1751–1781, 7: 903.

13

Earliest references: *Diderot & D'Alembert 1751–1781*, 7: 903; *Krünitz 1807*: 719–720; **Le Prince** (Paris 1780); **Solly** (1819): 51–52.

14

The rotting breaks down the longer, rather stiff fibres creating a more pliable paper.

15

Krünitz 1807: 719–720.

16

Balston 1957: 35; *Krill 1987*: 68, 71–72. An instrument for catching 'knots' from the pulp (*Knotenfänger*) was invented by Leipold August Franke in the 1820s; *Weiß 1983*: 265. A similar machine was invented by Richard Ibotson in England in 1830 and another one by Richard Holson in the same year, while Solomon Stimpson patented one in America on 12 March 1831; *Hunter 1978*: 546; *Weiß 1983*: 283.

17

John Baskerville published his first book with a number of pages printed with text on wove paper in March 1757. Images were not yet printed on wove paper at that time; *Hills 1988*: 68–69.

18

Balston 1957: 34–35.

19

Hills 1988: 74; *Paper for Copper Plates 1789*.

20

Balston 1957: 34–35; *Buchdruckerkunst 1835-2*: col. 76.

21

The Montgolfiers (father and sons) started preparations for the production of wove paper that same year, Mathieu Johannot began his production of wove paper in 1778–1779 and Réveillon in 1782; *Berthelé et al. 1933*.

22

Hills 1988: 78; *Iongh 1934*: 75.

23

Paper for Copper Plates 1789.

24

Krünitz 1807: 743; *Weiß 1983*: 207. The larger scale addition of fillers to paper pulp began in the 1820s; *Weiß 1983*: 265.

25

Bansa et al. 1980: 76.

26
Braat et al. 1998: 170; *Hunter 1978*: 229. Measures give or take a centimetre.

27
The copy of Ptolemy's *Geographia* edited by Francesco Berlinghieri in the Herzog August Library, Wolfenbüttel, is most likely bound once only compared to other copies I have seen, which are all more cropped. The maps are among the larger engravings of the period. The sheets onto which the maps are printed show few losses, measure 41.8 × 57 cm, thus the uncut sheet would have measured c. 44 × 59 cm. *Berlinghieri 1482*.

28
The woodcuts comprising Jacopo de' Barbari's bird's eye view of Venice (1500) are printed on a series of sheets each measuring 79 × 106 cm; such large sheets were probably custom-made; HAB, Top. 32b: 44.3.

29
Bernardo Prevedari, *Interior of a Ruined Church or Temple, with Figures*, 1481 (see Fig. 21, p. 27). The engraving measures 70.5 × 51.3 cm and is printed on two overlapping sheets of paper in one run; *Landau & Parshall 1994*: 104–107. Giorgio Ghisi's *School of Athens*, 1550, after Raphael (B. 24), measures 51.0 × 81.5 cm, the image being engraved on two plates and printed on two separate leaves pasted together to form one larger sheet. Ghisi's *Disputa* after Raphael from 1552 (B. 23), measuring 52.1 × 84.4 cm, is also engraved on two plates and printed on two sheets pasted together afterwards.

30
Filedt Kok et al. 1994: 370–371; *Laurentius 2006*: 93, 97–98.

31
After *Filedt Kok et al. 1994*: 370. The table was probably compiled by Jan van der Waals.

32
Boithias & Mondin 1981: 251; *Briquet 1923*: 6; *Reynaud 1981*: 89. *Bothias & Mondin* give some more paper formats without mentioning a source, which creates uncertainty about whether the formats also relate to the *Arrêt* of 1741.

33
Measurements in the *Arrêt* are given in *pouces* and *lignes*. *Briquet* calculates 1 *pouce* = 27.06 mm, while there are 12 *lignes* in 1 *pouce*. His calculations in centimetres follow. *Bothias & Mondin* give larger sizes in centimetres for the same formats.

34
Names given to these larger formats are *Jésus, Petit Soleil, Capucin, Soleil, Colombier, Grand Aigle, Monde*; *Reynaud 1981*: 90.

35
Briquet calculates 1 *livre* = 0.489 kg. One ream is twenty 'books', a book is either 24 (printing paper) or 25 (writing paper) sheets. *Bothias & Mondin 1981*: 251; *Briquet 1923*: 6; *Reynaud 1981*: 89.

36
This paper format was called *Grand Monde*; *Boithias & Mondin 1981*: 251; *Grand-Carteret 1913*: 39–40.

37
Hills 1988: 72–73.

38
Le Blanc 1854, 1: 356; *Nagler 1838*, 6: 139.

39
Hills 1988: 73; the paper was produced from 1772 until about 1936. The largest sheet made by Whatman until then was 'double Elephant' of 26½ × 40 in. (67 × 102 cm).

40
Hunter 1978: 341–349.

41
Henry Fourdrinier took out a patent on a papermaking machine on 24 July 1806 (English patent, A.D. 1806, July 24.–No. 2951), with further additions on 14 August 1807; *Hunter 1978*: 130, 527.

42
Berthiaud (Paris 1837): 139.

43
The print collections of the Herzog August Library, Wolfenbüttel, hold 43 loose sheets with four deckle edges, 14 parcels of unbound prints on full or half sheets and one unbound parcel of smaller leaves; the parcels are kept together with a simple stitch. Many bound print series in this collection as well as in the print collection of the Fürsten of Waldburg-Wolfegg show that plates were printed on half or full sheets. The stocklist of Cornelis Claesz, Amsterdam 1609, offers prints by Dürer on half leaves (*halve folien*) and quarter leaves (*vierendeelen*); *Hollstein Dutch & Flemish*, 69, *The Wierix family, introduction and guide to the catalogue*: xxvi. Practically all printshop interiors from before 1800 show prints with wide margins hanging to dry over laths or ropes, see below under 'Printing by press' and Chapter 2, p. 96.

44
See below under 'Bound print series'.

45
Von Rumohr & Thiele 2008: 17.

46
See Chapter 1, p. 45.

47
Bury 2001: 233; *Gnan 2007*: 31–32; *Reed & Wallace 1989*: 22–24.

48
Some authors state that a number of Hercules Segers's etchings are printed on yellowish or brownish papers. However, a more likely explanation is that all the papers used for colour(ed) prints became yellow or brown due to the oil paint used for colour printing and overpainting that stained the originally white paper; *Van der Waals 1988*: 137. For examples of printing with white ink on black prepared paper see Fig. 44, p. 44**,** Fig. 274 and: *Grimm et al. 2011*: 84–85, no. 27. A modern variety is intaglio printing on wax-coated paper; **Dull

(2003).
49
Reed & Wallace 1989: 18–19.
50
See below under 'Printing *au repérage*'.
51
Rodari 1996: 41–43. Rembrandt printed some of his plates on 'oatmeal', a greyish kind of wrapping paper containing fibres of various brown hues. However, this cannot be regarded as a true coloured paper.
52
Coloured papers tend to fade to a brownish hue and white papers tend to yellow, which makes it difficult to distinguish their original tint.
53
Hinterding 2006, 1: 122–124; *Slive 2009*: 173–175, 236 n. 77. The earliest plates printed on Japanese paper are the portrait of Jan Asselijn (known as 'Crabbetje') of c.1647 (W&B 277) and the portrait of Jan Six (W&B 285). Rembrandt continued to use Japanese paper as late as 1659, for example for impressions of his portrait of Lieven Willemsz van Coppenol (larger plate, W&B 283) of c.1658 and *Jupiter and Antiope* (large plate, W&B 203) of 1659. Rembrandt's particular use of oriental paper was observed by Edward Browne, who called it 'Indian paper' upon his visit to Amsterdam in 1668; *Van Strien 1993*: 255. The oriental paper was recorded by Le Comte and De Piles, who called it *papier de Soïe* and *papier de la Chine*; **Le Comte** (Paris 1699–1700) 3: 126; *Piles 1699*: 434.
54
Biörklund 1968: 173, indicates: 'There is in the State Archives an invoice of the ship "De Swaen" dated October 1st 1643 for two casks of Japanese paper and, in a memoire of merchandise to be delivered by the Japanese "both for the Netherlands and for India", 3,000 sheets of Japanese paper is mentioned. This memoir is dated November 6th 1644.'
55
The material aspects and provenance of the oriental paper are discussed in: *Van Breda 1997*.
56
The first VOC administrative ledger on oriental (not Japanese) paper dates from 1607; National Archive, The Hague, *Overgekomen brieven en papieren uit Indië aan de Heren XVII en de kamer Amsterdam*, inv. 1053, for 1607. Japanese paper was used by the Dutch factory in Hirado from at least 1633 onwards; National Archive, The Hague, *Negotie Journaal*, NFJ inv. 53, for 1633–1636. The idea that Biörklund's evidence is 'weak proof' and that 'certain amounts of Japanese papers were traded between Japan and Batavia/the Netherlands at least in 1633 officially' is suggested by *Yasuda 1999*: 7–8. The VOC set up its first trading post or factory in the southwest of Japan at Hirado in 1609, moving to the artificial island of Dejima in the bay of Nagasaki in 1641. Trade between the two countries also ensured the acquisition of Japanese paper for use by the VOC administration at the factory. The VOC factory in Hirado bought at least 13,250 sheets of Japanese paper in the mid-1630s; National Archive, The Hague, *Negotie Journaal*, NFJ inv. 835–837, for the period from 1 July 1635 to 27 November 1637. Ledgers were bound in Japanese paper due to insufficient supplies of European paper. The ledgers were often manufactured of Japanese paper, usually a thicker kind of *gampi*, known as *Torinoko* spelled 'Torronocque' in NFJ 836 for 6 September 1636; National Archive, The Hague, *Negotie Journaal*, NFJ inv. 835–837, for the period 1633–1660. The subject has been researched by paper conservator Tomoko Yasuda, to whom I am much obliged.
57
On 22 June 1664 John Evelyn was shown by a Jesuit called Tomson 'a collection of rarities, sent from the Jesuits of Japan and Chine'. Among the objects was 'a sort of paper very broad, thin, and fine, like abortive parchment, and exquisitely polished, of an amber yellow, exceeding glorius and pretty to look on, and seeming to be like that which my Lord Virulam describes in his *Nova Atlantis*'; *Dobson 1996*: 210. Perhaps Evelyn was mistaken, because I have been unable to find any reference to oriental paper in Bacon's collected works of 1638 nor in later editions; Franciscus Baconus Baron de Verulamio, *Operum moralium et civilium tomus (etc.): Nova Atlantis*, London: Norton (etc.), 1638. The father of Jean Michel Papillon, the woodcutter, bought three sheets of (decorated) 'Chinese' paper from a seafaring captain in 1695. Decorated oriental paper was copied in Holland, Flanders and Germany and the Dutch acquired their paper for the purpose from China. Papillon states that he owned Chinese paper, both decorated and plain; *Papillon 1766*, 1: 374, 380–381. Whether this always concerned actual Chinese paper should be viewed with some suspicion – Edward Browne, see note above, described 'Indian paper', using the term 'Indian' to apply to everything oriental. The difference between European and oriental paper was observed clearly, however, oriental paper being described by Evelyn as 'fine, like abortive parchment', and by others as *Satijnpapier*, or *papier de Soïe*, but authors could not discern between papers from different Asian regions; *Catalogus 1690*: 39; **Le Comte** (Paris 1699–1700) 3: 126. Oriental works on paper are found regularly in European inventories and sale advertisements throughout the seventeenth century; *Catalogus 1695*: 69 no. 85; *Walravens 1998*: 168–172.
58
Halde 1736, 2: 286–293.
59
Hunter 1978: 495. Oriental paper was generally known in England as 'India' paper, which sometimes led to the confusion that all types were produced in India itself; *India Paper 1817*.
60
An early example of its use for intaglio printing is a St. Prosper by Francesco Barolozzi after Guercino dated in the plate 'Londra 1764'; *Lambert 1987*: 175, fig. 170B.
61
Mendez 1986: [3] nos. 2, 3, 4, 11, 12, 13, 14, 19. I am aware of the seeming contradiction with the possible availability of Japanese paper on the European market before 1750 and the presence of impressions of seventeenth-century plates on oriental paper. Fibre analysis may be helpful here to shed light on this problem.
62
See below under '*Chine collé*'.
63
Hédou 1970: 193–194.

64

Chinese paper was copied in England, France and Germany; *Brégaut 1827*: 48; *Jenkins 1990*: 50–51. It came into regular use in France by the early twentieth century, while real Chinese paper had become rare; **Profit** (Paris 1913): 113–114. *Simili Japon* papers were imported into Japan by at least 1901 and the Japanese copied them again; *Schenck 2009*: 79.

65

Hollenberg 2 (München 2008): 185–194; **Lalanne** (Paris 1866): 90; **Profit** (Paris 1913): 114; *Schenck 2009*. **Chattock** (1880–1882) 3: 24, 4: 4, states that Japanese paper 'has a general tendency to yield "dry" proofs', by which he perhaps means that the impressions were not as dark and tonal as those on European paper. **Lalanne** (Paris 1866): 90; *Schenck 2009*.

66

Barrett 1989: 22, 'interrupted bonding', see also p. 27, n. 55; *Heim 1956*: 48; *Renker 1930*: 122–123; *Schulte 1955*: 139–141.

67

Berthiaud (Paris 1837): 137, the blue would fade after time, though, especially if the paper was exposed to light too often.

68

Karl Wilhelm Scheele discovered chlorine in 1774, which was later used for bleaching paper; *Hunter 1978*: 318, 503; *Iongh 1934*: 93.

69

Barth (Hildburghausen & Meiningen 1837) 2: 172–173; **Berthiaud** (Paris 1837): 138, 145, 146; *Dyson 1984*: 165–166. Senefelder believed that bleaching chemicals in printing papers could damage the imagery on lithographic stones; *Senefelder 1818*: 219.

70

Krill 1987: 13, 75.

71

Oeconomische courant 1799–1803, 1 (73): 166.

72

See Chapter 3, p. 228.

73

Naylor 1975: xii–xiii; *Hopkinson 2002*: 292. His pupil Mortimer Menpes sketched a vivid picture of this hunt for old paper. He recalled how, upon finding a London shop that could supply him with 'some six thousand sheets of old paper – French, Dutch, and English – the real priceless hand-made, of all sorts and sizes … my heart, like Macbeth's, "knocked at my ribs against the use of Nature"'; **Menpes 1** (1889): 330–331. Emanuel and Steel mention the 'hunt for old paper' and how difficult and expensive it was to procure, nevertheless it was still used; **Emanuel** (London 1930): 48–49; **Steel** (London 1938): 52–53.

74

Paton (1893–1894) 3: 43; **Paton** (London 1895): 111. I have also observed that old paper picks up the ink better than new paper.

75

Goulding (Stirling 1910); **Herkomer** (London 1892); **Stauffer-Bern** (Dresden 1907).

76

Turner 1991.

77

For casts see below under 'Casting'.

78

See Chapter 1, p. 34.

79

Bonnardot 2002: 80; **Bosse** (Paris 1637): fol. 138r, 139r; **Hayter** (London 1949): 142; *Lennox-Boyd 1992*: 387; **Martinez García** & **Rosa Pastor Cubillo** (2007); **Peterdi** (New York 1959): 169. A rarity is an etching printed on a condom made of sheep's gut of 1840; *Lennox-Boyd 1992-2*.

80

Bury 2001: 48, also p. 72: '*Drappi*, the term used, is generic; it probably means silk but could refer to a material such as fine linen.' The amount of a hundred indicates that the printing on textile was no longer experimental by then but quite common. The 1581 inventory of the printshop of Stefano Duchet and Paolo Graziani mentions hundreds of impressions on textile (*taffettani*); *Pagani 2008-1*: 18 nos. 447–454. For the earlier printing of textile with woodblocks see Chapter 1, p. 34.

81

Geijer 1979: 211; *Lennox-Boyd 1990*; *Spamer 1930*: 101–102.

82

Müller (Frankfurt 1780): 231.

83

Forrer 1898, pl. XXIX; *Lennox-Boyd 1990*; *Schneider 1975* nos. 133, 135; *Van der Waals 2006*: 30 cat. 13, 31–32 cat. 15, 33–34 cat. 19. Samuel Pepys noted in his diary for 24 August 1663 that he had suggested to Lord Sandwich that he should have some impressions made on white silk of his seven views of Lisbon etched by Dirck Stoop, which his Lordship had promptly done; *Delmas 2005*: 89.

84

Delmas 2005; *Griffiths 1992*; *Revue 1905*: 103.

85

Schneider 1975: nos. 131, 133

86

Bonnardot 2002: 79.

87

For Dürer see: *Hollstein German*, 7, Albrecht Dürer: nos. 60, 74, 102, 103, 105; *Schoch et al. 2001*: 22. For Rembrandt see: *Roscam Abbing 1996*. It raises the question as to why Rembrandt, who experimented with printing on different kinds of paper and on parchment, never printed on textile. Note that impressions on textile are difficult to date because of the absence of particular structures or marks, unlike paper that carries watermarks.

88

HB 13 I a: printed in black on grey prepared linen; HB 13 IIIo: printed on yellow prepared linen; HB 27 Ic: printed in dark blue on off-white prepared linen; HB 27 Io: counterproof in dark green on yellowish brown prepared cotton, next overpainted in various colours; HB 28b: printed on yellow-brown prepared cotton; HB 35a: printed on cotton; HB 40: printed in black on linen prepared with a grey ground, next overpainted with various colours; HB 41: printed on linen prepared with a white ground (cracked); HB 52: printed on grey prepared linen; HB 53: printed on grey prepared linen; HB 54a: printed on off-white prepared cotton. Analyses carried out at the former Central Research Laboratory combined with my observations; Judith H. Hofenk de Graaf, *Hercules Seghers. Weefselonderzoek van een aantal etsen*, Amsterdam: Centraal Laboratorium, 1968–1973, docmap 68/48. *Van der Waals 1988*: 138. With HB 13 IIIp, HB 14 IIIp Segers embossed a cloth structure into finished prints on paper, probably also with the intention of making it resemble a painting; see below under 'Blind embossment'.

89

Geijer 1979: 211; *Jacqué & Wisse 1992*: 11, 13, 15; *Milano 1991*; *Mortier 1992*: 12–15; *Schneider 1975*: no. 119; *Snodin 1992*; *Van der Waals 2006*: 37, cat. 27 and pp. 92–93, cat. 123.

90

Bosse (Paris 1637): fol. 138r, 139r; *Van Dillen 1974*: 542 no. 1061, act of 1 November 1649; **Filleau des Billettes** (Paris 1693–1698): fol. 158r; **Tiquet** (Anwerpen 1741): 91: 'etching plates for printing on textile fabric need to be etched with an acid stronger than the mixture used for printing on paper'; he means that the grooves in the plates need to be etched more deeply.

91

Orenstein 1991-1, *1991-2*; *Van Dillen 1974*: 542 no. 1061. Magdalena de Passe also produced printed textiles for religious purposes c.1620–1630; *Veldman 2001-1*: 291–292.

92

Brédif 1989: 46, 52, 58; *Jacqué 1985*: 146–154, the following pages with information on other French cloth-printing factories; *Jacqué & Wisse 1992*: 15.

93

Rotary intaglio printing, a form of mechanisation, developed from this, see below under 'Rotary presses'.

94

Hayter (London 1949): 138–139; **Peterdi** (New York 1959): 169.

95

Shure (San Francisco 2000): 65–69. For *chine collé* printing see below under '*Chine collé*'.

96

Raffa & **Spinelli** (2003).

97

Scott (London 1994): 60–63, 116. Earlier tests, pressing intaglio plates inked with underglaze colours in pottery clay and firing them, were carried out by Hayter and his students. Although the tests were successful, they were not continued; **Hayter** (London 1949): 153–154. See also below under 'Casting'.

98

Spamer 1930: 324, *Taf*. CLXXVIII, 1; **Shure** (San Francisco 2000): 103; *Wax* (London 1990), p. 146, fig.

99

Spamer 1930: 102–103, *Taf*. CLXXVIII, 2; *Von Uffenbach 1754*, 3: 306.

100

See also below under 'Counterproof'.

101

Dossie (London, 2nd ed., 1764) 1: 397–398; **Fokke 2** (In den Hage 1804): 58–59; **Liebhaber 1** (Nürnberg 1696): 537–538; **Liebhaber 2** (Nürnberg 1703): 338 no. 26; *Oeconomische courant 1799–1803*, 1 (13): 100; **Schad** (Nürnberg 1800): 104–105.

102

Examples are: *Berger 1901*: 158, a recipe by Lucas Vosterman; **Compendium** (London 1797): 117–118; **Excellency** (London, 2nd ed., 1688): 80/I–81/I; **Glorez** (Regenspurg 1699) 3: 66, 105; **Lady** (London 1845): 149; **Valuable secrets** (Paris 1801) 1: 138–140. The same technique was also used for ornamenting screens, boxes and similar wooden objects, such as with Tunbridgeware; **Lady** (London 1845): 147–149.

103

Massing 1989, 2008. Such objects are easily recognisable because the varnish has usually turned yellow; with thanks to Ann Massing for discussing the subject.

104

Scott (London 1994): 17–21, with a further variant using a sheet of gelatin. For printing on paper clay see above under 'Latex and paper clay'. For casting or moulding an intaglio plate see below under 'Casting'.

105

The following paragraph is a revised version of *Stijnman 2003-1*.

106

See Chapter 2, p. 112.

107

For studies on the history of printing ink in general see: *Bloy 1967*; *Klaetsch 1940*; *Wiborg 1926*. For a concise introduction to modern printing inks for artistic printmaking see: *Hoskins 2004*.

108

For printing without ink see below under 'Blind embossment'.

109

Basic information on printing inks, their ingredients and behaviour is mainly derived from *Apps 1958*.

110

Drying qualities are expressed by the so-called 'iodine value'; the more unsaturated fatty acids, the higher the iodine value and the better

the drying qualities of the oil. The iodine value expresses how many grams of iodine can be absorbed by 100 g of oil; *Apps 1958*: 254–255; *Mayer 1991*: 475.

111

Apps 1958: 14–16; *Janssen 1986*: 276–277. Moxon mentions 'Trane-Oyl' from the whale as a cheap substitute but condemns its use; *Moxon 1978*: 83. For the use of olive oil on honing stones see Chapter 3, p. 164.

112

Livache 1899: 236–237, see also pp. 247–249; *Seymour 1910*: 8–9.

113

Marciana manuscript (Gaeta 1570): fol. 157v–158r; **Printing ink recipe** (1500–1525): fol. 22r. Both ink recipes can be dated to the first quarter of the sixteenth century, perhaps even earlier, and mention linseed oil.

114

Apps 1958: 16–17.

115

Bisset et al. 1979: 250.

116

Goulding (Sterling 1910): 74; *Rhodes 1924*: 135; *Seymour 1910*: 12–13. Baltic linseed oil was preferred because it had the best drying properties, in modern terms a high iodine value. The oil could absorb more oxygen than linseed oils from other regions; *Seymour 1910*: 12–13. Flax has been (and is) grown for the production of linseed oil with a low iodine value in the past decades. Slow-drying linseed oil is used by the food industry in foodstuffs to slow down oxidation and give a longer shelflife.

117

Andés 1903: 43; **Berthiaud** (Paris 1837): 39; *Buys 1920*: 138; *Champour & Malepeyre 1895*: 329; *Creuzburg 1884*: 126, 130; **Cröker** (Jena 1736): 72; **Goulding** (Sterling 1910): 74; *Halle 1761–1779*, 1: 225; *Thomson 1839*: 18. There is general agreement that fresh oil should not be used because it bubbles in cooking and thickens slowly, see below. Nicholson indicated in 1795 that very old oil does not need resin or litharge to improve its drying properties (in his discussion on the preparation of varnish for typographic ink) and young oil cannot be made into varnish without resin; *Nicholson 1795*, 1: 400. Berthiaud recommended an oil of 12–18 months old; **Berthiaud** (Paris 1837): 40. According to Goulding the oil should be at least five years old; **Goulding** (Stirling 1910): 74.

118

Bisset et al. 1979: 249; *Buys 1920*: 138–139; *Livache 1899*: 258–259. Hayo de Boer boiled both fresh and old oil in the summer of 2000, and the difference in behaviour between the two was striking. Even after a day of cooking, the fresh oil did not get much more viscous, while the old oil reacted more speedily, quickly turning into a varnish. The same observation is found in: **Cröker** (Jena 1736): 72. Linseed oil also becomes paler and more transparent when stored for periods of time.

119

There is an immense amount of eighteenth- and nineteenth-century literature on the bleaching and refining of vegetable oils, replacing linseed oil by cheaper substitutes, and making animal oils suitable for ink and paint. I researched this topic together with Leslie Carlyle in 1999, part of which is included in her dissertation; *Carlyle 2001*: 26–28, 31–38. Nothing seems to be known concerning the actual use of treated oils for printing inks, though, and research into binding media awaits future analysis of inks on historical prints.

120

Andés 1910: 6–7; *Rhodes 1924*: 135.

121

Andés 1910: 6–7; *Askew 1969*: 336–337; *Bisset et al. 1979*: 249–250; *Ellis 1940*: 45–64, *Livache 1899*: 227–235.

122

Bosse (Paris 1645): 66; *Carlyle 2001*: 25–26; *Servin 1620, Arrest* of 6 March 1620: 12; **Tempesti** (Firenze 1994): 159–160. Although Bosse mentions 'nut-oil' only, the Dutch edition reads 'linseed oil' with no mention of nut oil; **Bosse** (Amsterdam 1662): 103. This may be because walnut oil was a rare or expensive product in the Netherlands at the time (it still is expensive). Another consideration might be that it was considered preferable to eat the tasty walnuts and to press oil from the less edible linseed.

123

Bloy 1967: 14–15; *Ellis 1940*: 81; *Livache 1899*: 246–248.

124

John Evelyn, *The construction of the rowling press, and manner how to worke off the plates*, read May 14, 1662 for the Royal Society at London. Manuscript in the Library of the Royal Society. Copy in the British Library, London, shelfmark: Sloane Ms. 243: fol. 127b–141b. Edition: **Evelyn** (Oxford 1906), part II: 32. Poppy oil was a common binder for oil paints in the nineteenth century; *Carlyle 2001*: 25.

125

Apps 1958: 29; **Bosse** (Nürnberg 1795–1796) 1: 307; *Edlem von Keeß 1823*, 2: 42–43; **Le Blon** (Paris 1756): 113–114; *Model & Springer 1912*: 22; **Schad** (Augsburg 1800): 42; **Verfertigung** (1772).

126

Andés 1903: 12–14; *Livache 1899*: 248–251. There are no references available as to their use in intaglio ink.

127

Ellis 1940: 84–85; *Finley 1997*: 227–228; *Wiborg 1926*: 133. The German brand of 'Gutenberg' is a kind of intaglio ink produced with mineral oil as a vehicle since about 1990; the same ink is supplied by Gerstaecker. The ink dries fast, smells like diesel oil, its layers are not elastic and crack when the paper is bent or folded, while layers of ink based on linseed oil remain flexible.

128

Apps 1958: 26–27; *Ellis 1940*: 77–81; *Wiborg 1926*: 133, 145–146.

129

Finley 1997: 230–231. The oil is strongly promoted by the lobby of soy producers.

130

Apps 1958: 18. See also below under 'Interaction between ink and paper'.

131

See Chapter 1, p. 33.

132

Marciana manuscript (Gaeta 1570): fol. 157v–158r; **Printing ink recipe** (1500–1525): fol. 22r.

133

Bosse (Paris 1645): 66–67.

134

Goulding reminisced about the burning of the oil from his time as a boy apprentice during a lecture he gave 40 years later, in 1873, the boiling took a full day; **Goulding** (Sterling 1910): 74–75; *Janssen 1986*: 277–285; **Peterdi** (New York 1959): 155–156.

135

Apps 1958: 292–297; *Bisset et al. 1979*: 250; *Champour & Malepeyre 1895*: 334; *Rhodes 1924*: 135.

136

See below under 'Preparation of the ink'.

137

Bloy 1967, pl. 5; **Cröker** (Jena 1736): 69–70; *Janssen 1986*: 277–278; *Moxon 1978*: 75.

138

Berthiaud (Paris 1837): 40, pl. 2 no. 28; **Goulding** (Stirling 1910): 74.

139

Andés recommends boiling between 230 and 250°C to prevent discoloration of the oil; *Andés 1903*: 44. Most other sources mention boiling linseed oil at temperatures around 300°C. *Apps 1958*: 20; *Askew 1969*: 337; *Bisset et al. 1979*: 249–250; *Degaast & Frot 1934*: 157; *Ellis 1940*: 54; *Livache 1899*: 279; *Rhodes 1924*: 135; *Winkler 1920*: 272. Boiling and burning the oil was usually banned to outside the city walls to prevent fires; *Janssen 1986*: 278; *Van Nierop 1956*. Bosse recommends boiling and burning the oil in an inner court, if accidents are feared; **Bosse** (Paris 1645): 67.

140

'The same oil bodied by different methods, will yield liquids which behave entirely differently'; *Ellis 1940*: 47. Wardenaar refers to the various manners for boiling the oil; *Janssen 1986*: 281.

141

Janssen 1986: 278–279.

142

Cf. *Livache 1899*: 259.

143

Goulding (Sterling 1910): 74.

144

Seymour 1910: 9.

145

Apps 1958: 14.

146

The matter is more complex than is outlined here – much depends on the raw materials and the production methods.

147

Apps 1958: 21.

148

Bosse (Paris 1645): 74. For the properties of walnut oil see: *Livache 1899*: 246–248.

149

Nowadays, European companies express viscosity in *poise*, 1 *poise* is the thinnest (watery), 700 *poise* is the thickest (toffee-like). American companies give numbers #00000 (thinnest), #00 is 1 *poise*, to #10 (most viscous). English companies give 'thin' or 'weak' (1 *poise*), 'medium' and 'thick'. French companies indicate *huile claire* (thin), *huile grasse* (= 220 *poise*), *huile de lin polymérisée* (thick). *Ellis 1940*: 45; *Hoskins 2004*: 42–45.

150

Rhodes 1924: 135.

151

Bloy 1967, summaries of the recipes on pp. 101–125.

152

All modern Charbonnel inks contain 30 *poise* stand oil. Varnish of 200 *poise* is mixed with varnish of 30 *poise* for the black inks; *Charbonnel 2000*: 13. Absolute amounts are not given and comparable effects might be reached by mixing a 30 *poise* varnish with a 1 *poise* one, a #3 with a #00, or a medium with a thin varnish.

153

See below under 'Toner'. See also: Chapter 1, p. 45.

154

Bosse (Paris 1645): 74; *Halle 1761*: 225. When kept too cold the oil congeals, as Halle explains, but whether this has a bleaching effect is doubtful. For the clarification of oil with snow see: *Carlyle 2001*: 32.

155

Bloy 1967: 99 no. 2, 100 no. 6, 105 no. 15. For 'vitriol' and what salts might be meant by this term see: *Stijnman 2006*: 30–39, 68.

156

Fourcroy 1800: 324–325.

157

The firm of Charbonnel was taken over by Lefranc & Bourgeois in 1989; *Charbonnel 1989*: [1]. The latter continue producing ink with the brand name of 'Charbonnel'. The difference is that the former owner of Charbonnel boiled his oil to varnish himself, while Lefranc & Bourgeois have the varnish produced by a factory. The general opinion among the more experienced printmakers is that the older

Charbonnel inks are 'better' than the present ones.

158
See below, under 'Colorants'.

159
For a summary overview see: *Stijnman 2012-3*. For a general introduction to black pigments see: *Winter & West FitzHugh 2007*. For the scientific analysis of pigments in printing ink see: *Knuutinen & Stijnman 2010*; *Mommsen et al. 1996*; *Rosenberg et al. 1998*; *Schwab et al. 1983, 1987*; *Vives Piqué 2003*: 225–232; *Woodward 1987*; *Zahn 1992*.

160
Pigments such as Van Dyke brown, Cassel earth, Cologne earth and asphaltum powder differ in hue from brownish black to deep black when fresh.

161
Black metal compounds suitable as black pigments are black iron oxide ($FeO.Fe_2O_3$), manganese black (MnO_2), Spinell black ($Cu(CrFe)_2O_4$), lead disulphide (PbS_2), copper sulphide (CuO), antimony black (SbS_3), cobalt black (CoO), and Ilmenite black ($FeTiO_3$).

162
For a list of black carbon-hydrogen compounds see: *Lückert & Lückert 1977*: 184–187.

163
Actual production of carbon black probably began by 1872. *Apps 1958*: 140–143; *Askew 1969*: 312–313; *Bloy 1967*: 42–46; *Mayer 1960*: 47, 58; *Nédey 1953*; *Printing 1897*; *Wiborg 1926*: 166; *Winter & West Fitzhugh 2007*: 2, 20. This pigment is known as 'gas black' or 'furnace black' or after the material from which it is produced such as 'acetylene black' or 'benzol black'; the generic name is 'carbon black'.

164
Colour Index 1971: 4661, CI 77266, Pigment Black 6 and 7; *Winter 1983*: 56, 58. Seen with an electron microscope the single pigment grains have a typical spherical shape. Their size is measured in nanometres; *Lückert & Lückert 1977*: 176. In comparison, the particle size of black pigment used for intaglio ink is between 0.5 and 2 μm in diameter.

165
Apps 1958: 294. Recipes for black relief printing inks always contain driers. For driers see below under 'Additives'.

166
Venezia, Biblioteca Marciana, Ms IT. III-10 (1503–1527), recipe [329]: fol. 157r–v; transcription in *Merrifield 1849*, recipe [329]: 618–619. **Alessio** (Venetia 1555): 189; *Champour & Malepeyre 1895*: 331.

167
Senefelder 1818: 179–180.

168
Wiener Farbenkabinet 1794, 1: 30.

169
Despite this, lampblack is sometimes mentioned as a black pigment in intaglio ink recipes; **Borch** (Zwolle 1632): fol. C1r; **Zonca** (Padoua 1607): 77. In other cases lampblack is mixed with another black pigment and functions as a toner.

170
Bone black, made by charring animal bones, is a commonly available pigment; *Baer et al. 1971*; *Colour Index 1971*: 4661, Pigment Black 9; *Winter 1983*: 56, 61. It is usually named 'ivory black' but since 1940 black with this name has seldom actually been made from ivory; *Apps 1958*: 143; *Wehlte 2001*: 164. Bone and ivory black are chemically the same, but their physical structures are different. The trade in ivory is strictly controlled – ivory black is now produced from old piano keys and billiard balls; http://www.kremer-pigmente.com/12000.htm (2010). The critical temperature at which ivory chars to a deep black is 593°C; a similar temperature is required to char bones; *Baer et al. 1971*: 3. Bones are a cheaper substitute, while both blacks have the same elements in the same proportions; *Mayer 1991*: 66. Bone black also seems to have been used by the earliest Japanese etchers; *Sugano 1974*: 126.

171
Meyer 1991: 66; *Valenta 1904–1914*, 2: 249–250.

172
An early reference can be found in a Parisian *Sentence de police* from 1732; *Bloy 1967*: 80, ill. 4; *Courboin 1914*: 5 n. 1. For other pre-1900 explicit references to bone and ivory black for intaglio printing ink see: *Buys 1769–1778*, 6: 264; *Champour & Malepeyre 1895*: 331, emphasising that the bones should not be degreased (*des os non dégraissés*) before charring, which gives a greater amount of carbon in the bone black than if plain bones were used; *Diderot & D'Alembert 1751–1781*, 11: 187 (*Noir d'Allmagne*).

173
Lefranc & Bourgeois 2000: 13, 24, here named 'ivory black'.

174
Bagelaar (Haarlem 1817): 24, 26–28; *Bersch 1893*: 391; **Verfertigung** (1772). It is preferable to take equal parts of lampblack and bone black; *Waldow 1884*: 244; **Zonca** (Padua 1607): 77.

175
It is possible to prepare an intaglio ink made from carbon black and thin oil varnish, which can be used in intaglio printing. The drawback is that the ink takes a long time to dry, meanwhile forming haloes or coronas around the ink lines. Such ink may be used for fine, shallow structures where the ink layer is only superficial.

176
See below under 'Additives'.

177
The following is a shorter revised version of *Stijnman 2010-1* and *2012-2*. With thanks to Jo Kirby-Atkinson for reviewing the following text.

178
I know of more than 160 references to Frankfurt black used for intaglio ink between 1640 and 1900, compared to eight (possible) references to bone black and twenty-six references to lampblack in the same period. More references in printed sources will be found, but it is unlikely that they will give further details on the subject. Hopefully future archival research will bring to light more information

on the production, trade and use of Frankfurt black.

179

Meyer 2006: 257–278; **Zonca** (Padua 1607): 77. For a study of wine-lees cokes see: *Winter 1983*: 58–59.

180

Lancre en est faite dhuille de noix, bruslée et de noir de lie de vin, dont le meilleur vient Dallemagne; *Bosse 1642*.

181

Le meilleur noir dont on se sert pour imprimer les Tailles douces a nom Noir d'Allemagne, & vient de Francfort; sa beauté & bonté est, d'estre d'un oeil & d'un noir de velours, & qu'en le froissant entre les doigts, il s'ecrase comme de fine croye ou amidon crud; le contrefait n'a point un si beau noir, & au lieu de le sentir doux entre les doigts, il est rude & graveleux & use fort les planches; il se fait de lie de vin bruslée; **Bosse** (Paris 1645): 66.

182

Excellency (London 1668): 109.

183

Terms found are: (Dutch) *Frankfort zwart*, *Frankfurterzwart*, (English) 'Franckford-black', 'Frankfurt black', 'German black', (German) *Deutsch-Schwarz*, *Frankfurther Schwärze*, *Frankfurterschwarz*, *Hefenschwarz*, *Kupfferdrucker-Farb*, *Kupffer-Drucker-Schwärtze*, *Kupfer-Schwärze*, *Sammet-Schwärze*, (French) *Noir d'Allemagne*, *Noir de Francfort*, (Italian) *nero di Alemagna*, (Latin) *Atramentum Francofurtense*, (Spanish) *negro de Alemania*.

184

The pigment 'vine black' is made from the charred tendrils of the vine and is also known as: *noir de vigne*, *Drusenschwarz*, *Rebenschwarz*, or *wijngaardzwart*.

185

When René François (1621) described typographic printing he explained that its ink is a composition of black from Germany and other materials. In this case 'German black' means lampblack, because only lampblack is used for typographic ink, as explained above; *François 1621*: 186. John Evelyn, reading his translation of the part on ink from Bosse's manual to the Royal Society on 14 May 1662, confused the two: 'Printers black used for our plates is call'd in French *noir d'Allemayne*, and by our drugists keen-rus; it comes from Francford, and is sold by the salters'; **Evelyn** (Oxford 1906), part II, 17. 'Keen-rus' is a kind of lampblack made by burning resin. A century later the item *Imprimerie* in volume 8 of the *Encyclopédie* of Diderot & d'Alembert, also transposed the terms by listing lampblack for book printers and Frankfurt black for plate printers; *Diderot & d'Alembert 1751–1781*, 8: 620–623, *Imprimerie en taille douce …* (p. 621:) *Du noir de fumée ou de noir d'Allemagne. Le meilleur noir qui soit à l'usage des Imprimeurs en taille douce se fait par la combustion des matieres résineuses; c'est une véritable suie (etc.)*. The article continues with a description of Frankfurt black along similar lines to Bosse and, like Evelyn, the author makes the same mistake of explaining that the common black, which wears the plate, is made of burnt wine lees. The description of Frankfurt black with the item *Noir d'Allemagne* is correct, though, and is copied after Pomet's handbook on *materia medica*; *Diderot & d'Alembert 1751–1781*, 11: 187, *Noir d'Allemagne*; *Pomet 1694*: 256.

186

Brugghen (Amsterdam 1616): fol. D3r–D4r. Note that the Netherlands was a wine-growing country at the time. The inventory of the engraver Jan Jansz. van Doetechum compiled in Rotterdam (?) on 23 January 1608 mentions together with the printing equipment 'a mustard mill for grinding paint', probably used for grinding the pigment; *Algemeen 1883*, 15: 2; *Alting Mees*: 190. A water mill was used in Frankfurt am Main for grinding pigments and it has been suggested that Frankfurt black was ground here; *Lübbecke 1948*: 108.

187

Pomet 1694: 256.

188

Oeconomische Encyclopädie 1773–1858, 56: 230–233.

189

Ibid., 56: 231. This is superior to Ter Brugghen, who chars rolls of dregs in an open fire and relies on the outer layer of the rolls, which oxidise, to prevent the insides of the rolls from oxidising with the consequent loss of material.

190

Leuchs 1825, 2: 379–380. Cf. with the addition of brown toners in the nineteenth century, see below under 'Toners'.

191

Later authors give similar descriptions and replace the hot water by diluted hydrochloric acid to neutralise the lye; *Jacobson 1868*: 110–111; *Valenta 1904–1914*, 2: 259.

192

Field 1835: 180.

193

Goulding (Stirling 1910): 73.

194

Bersch 1893: 374–378. This agrees with my personal experiences.

195

Mitchell & Hepworth 1904: 153; *Rhodes 1924*: 137.

196

Bartels 1918: 65–66; *Wiborg 1926*: 151.

197

The English firm of T.N. Lawrence & Son sells a Frankfurt black that is 'made from burnt animal bone charcoal'; letter from T.N. Lawrence & Son, 29 July 1993. The American Graphic Chemical & Ink Co sells a Frankfurt black which 'is an equal mix of bone and vine blacks'; email from Graphic Chemical & Ink Co, 11 January 2006.

198

Buchwald 1904: 63. *Pohl et al. 1983*: 26–27, 84–85. Cf. *Gentele 1860*: 278, where the author states that Frankfurt black is prepared by only a few persons (*von einzelnen Personen verarbeitet*). This seems to point to small-scale home industry. Ysbrand Vincent writes that the best

quality is made by *een meester*, which can be translated as 'a' or 'one' master; *Sabbe 1928*: 200. Further archival research may elucidate this case of a lost pigment. Any local knowledge about Frankfurt black seems to have vanished. Peter Heilmann, pharmacist at Mainz, made general enquiries about Frankfurt black in the Mainz area without any results; personal correspondence in 1994–1995. Kurt Wettengl, *Oberkustos* of the Historisches Museum in Frankfurt am Main, was unaware of the pigment and was unable to supply any sources; personal correspondence in 2001.

199
In Paris, for example, the number of intaglio printshops reduced from 137 in 1860 to 74 in 1915; *Frèrebeau 1974*: 12. *Dyson 1984*: 10.

200
Apps 1958: 146, mentions a carbon black (Statex Densed Black) for 'copperplate inks, sometimes with precipitated chalk extender … which results in a clean wiping ink'; he probably means ink for rotogravure. **Berthiaud** (Paris 1837): 57, 274; **Goulding** (Stirling 1910): 73; *Waldow 1884*: 244.

201
Printing 1897.

202
The bleeding of varnish from the ink into the paper is recorded occasionally; *Praktisches Handbuch 1803*; **Henrici** (Leipzig 1834): 62. A blue toner will not remedy this, but it can neutralise the hue of the browned varnish in and on top of the ink layer; **Berthiaud** (Paris 1837): 274.

203
Nehme Indig den vierdten Theil unter die beste schwartze Kupfferdrucker-Farb; **Glorez** (Regensburg 1699), Dritter Theil: fol. B3r (p. 13).

204
Some further references to toners in intaglio ink are documented. Indigo: *Oeconomische Encyclopädie 1773–1858*, 56: 233. Indigo or Prussian blue: *Oeconomische courant 1799*: 260. Prussian blue: **Tiquet** (Antwerpen 1741): 99. Indigo is common, verdigris is mentioned but not preferred, the French use Prussian blue: *Voet 1966*: 234. Indigo or Prussian blue: *Voit 1786–1790*: 95–96.

205
Bagelaar (Haarlem 1817): 26 n. 7. Red and brown toners were also added to black lithographic ink in that period; *Edlem von Keeß*, 2: 20.

206
Berthiaud (Paris 1837): 273–275.

207
Ibid., 136–137, the papermakers even added some blue to the pulp to make the paper look whiter.

208
Wiborg 1926: 197.

209
See Chapter 2, pp. 89 and 92.

210
Lalanne (Paris 1866): 89.

211
Chattock (1881): 22; **Roller** (Wien 1888): 88.

212
Lalanne (London 1880): 72, n. 23. Umber may also be used as a toner, and umber containing manganese is also an effective drier, see below under 'Driers'; **Lumsden** (London 1925): 85; **Menpes 1** (1889): 329.

213
Herkomer (London, New York 1892): 61.

214
Goulding (Sterling 1910): 61, letter from Seymour Haden to the plate printer Fredrick Goulding of 16 March 1897; **Steel** (London 1938): 55.

215
Champour & Malepeyre 1895: 329–338.

216
Ibid., 336.

217
Prussian blue is mixed in as a toner with the black inks nos. 55985, 71303 and Luxe C of the twentieth-century producers of artists' materials Lefranc & Bourgeois; *Lefranc & Bourgeois 2000*: 24, 27.

218
Apps 1958: 39.

219
Andés 1903: 36–39, mentions the 'new driers', which are manganese compounds. *La Rue 1856*, on manganese compounds. *Livache 1899*: 303–309 for lead compounds: 287–289 and 309–313 for manganese compounds. *Seymour 1910*: 66–69, mentions mainly lead compounds with one reference to 'manganese borate'. In all these cases the driers are used in the preparation of typographic printing ink. *Mayer 1991*: 245, found a first reference to a cobalt drier (for oil paint?) in 1852, but this is not mentioned in the above sources on printing ink. Cobalt compounds used as driers were known then, but it was some time before they were introduced for commercial purposes; *Ellis 1940*: 100. They are probably the driers used in the present colour intaglio inks.

220
Edlem von Keeß 1823, 2: 43, mentions that 10% *oleum litharg.* is added to the inks in multiple-plate colour printing.

221
Three references are known from the nineteenth century. Berthiaud adds Prussian blue to the black as a toner, but states that it also accelerates drying. Hansard used a mixture of litharge (PbO), white copperas (ZnSO$_4$) and sugar of lead (lead acetate, Pb(C$_2$H$_3$O$_2$)$_2$) as driers to copper plate ink. Champour & Malepeyre use litharge and manganese for typographic ink, and add Prussian blue to intaglio ink. Menpes refers to the use of umber as a toner, which because of its manganese content is also a drier, as mentioned above; **Berthiaud** (Paris 1837): 274; *Bloy 1967*: 119–120 no. 55 (recipe by Hansard, 1841); *Champour & Malepeyre 1895*: 236–237, 254, 336; **Menpes 1** (1889): 329. For

modern driers see: *Ullmann 1972–1984*, 23: 421–424.

222

Brugghen (Amsterdam 1616): fol. D4r. Egg white is also found in recipes for relief printing ink. It may have been mixed with coloured typographic ink to give some gloss to the ink, or perhaps it worked as an emulsifier; *Bloy 1967*: 22, 111 no. 30, 114–115 no. 41.

223

Apps 1958: 123–127. A first reference to adding chalk to improve the wiping qualities of an ink for printing steel plates is found in: *Burns 1947*: 270.

224

Letter from T.N. Lawrence & Son Ltd, 29 July 1993, discussing the properties of the black pigments they supply: 'Light French Black is made from Furnace black (a fairly pure carbon) with an inert extender'. No details were given about this extender.

225

Bloy 1967: 15; *Stijnman 1992*: 40–41, 46–47. See above under 'Oil varnish'.

226

Bate (London 1635): 277; **Dossie** (London 1758): 205; *Halle 1761*: 227; *Krünitz 1792*: 233; **Querfurt** (Wien 1792): 156; **Schad** (Augsburg 1800): 42; **Verfertigung** (1772).

227

Bosse (Paris 1645): 71–72. The oxgall is the emulsifier, the presence of the other two ingredients is not understood.

228

Bloy 1967: 20, 23, 25.

229

Champour & Malepeyre (Paris, 2nd ed., 1895): 334. It is not clear whether the *savon de résine* functions as an emulsifier or if its resin gives more brilliance to the ink.

230

Charbonnel 2000: 25–27. Some colours by Lefranc & Bourgeois, especially the yellows, carried a label *dangereux* up to the 1990s. See below under 'Colour'.

231

The binder of an oil-based intaglio ink does not cause health or safety problems, linseed oils are edible and benign; *Hoskins 2004*: 88.

232

Ayres (New York 1993): 25, 88–89. This first acrylic intaglio ink, called Createx, was produced by the American Colorcraft Company. Another American brand name was Green Drop, producer not known. Experiments with water-based intaglio inks are not new. The printing industry introduced highly volatile aromatic solvents in rotogravure inks to make them liquid enough for the speed of the printing process from the end of the nineteenth century. For economic and health reasons alternatives for these 'evil smelling inks' were sought by developing water-based inks. The first water-based rotogravure inks were already being used in Germany in 1904 and such inks were constantly developed throughout the following decades, although they were not applied frequently in practice; *Askew 1969*: 510, 530; *Finley 1997*: 302–303; *Hartmann 1914*: 69. For extensive information on the composition of such water-based intaglio inks see: *Ellis 1940*: 276–281.

233

Hoskins 2004: 88; Hoskins discusses the issue in relation to relief printing inks, but the same information applies to intaglio inks. The firm of Akua-Kolor, New York, producers of water-based monotype inks, developed different formulae and have supplied their water-based intaglio inks since 2001.

234

In washing with water the gum arabic dissolves in the water, carrying off the ink. The ink of the print dries because of the evaporation of water and the oxidation of the oil. The gum arabic remains in the ink and will dissolve in water again.

235

A film of soy oil on a glass plate takes at least three weeks to dry and stays sticky. A similar film of raw linseed oil takes over a week. Linseed oil varnishes dry to a smooth solid layer in five to seven days.

236

In washing with water the glycol dissolves in water, the binding medium carrying the pigment (= ink) precipitates and is carried off with the water. The ink of the print dries because of the evaporation of glycol, possibly also water, and the oxidation of the oil. Water-washable offset inks, so-called 'moisture-set inks', based on soy oil and mixed with a glycol were developed in the 1990s and rapidly introduced in the European offset industry from about 2005 to significantly reduce the use of volatile organic solvents in cleaning printing plates, rubber cloths and rollers. Similar recipes are used for artistic intaglio and relief printing inks and today almost every producer sells a range of water-washable inks. Because intaglio inks containing emulsifiers of any kind are a recent development there is no evidence available yet as to the longevity of prints made with them. It is therefore uncertain as to how they will behave, whether their appearance will deteriorate over time, or how they will react to conservation treatments now common. For a workshop test of such inks see: *Rorke & Taylor 2011*.

237

See also below under 'Colour Printing Procedures'.

238

Some pigments do not combine well with oils. For example, chalk powder makes a good white in tempera, but turns yellow when mixed with oil.

239

XRF analysis at the former Central Research Laboratory, Amsterdam, project no. 94-250. With thanks to Peter Hallebeek for carrying out this and the following analyses and to Ger Luijten for allowing the objects to be analysed. See also: Chapter 1, p. 45.

240

Analyses of the brown(ed) ink in: *Battle of Satyrs Riding Seahorses with an Old Woman (Invidia)* by Andrea Mantegna and *Mary with the Child in a Cave* after Andrea Mantegna, both from the collection of the Rijksprentenkabinet, Amsterdam, inv. nos. RP-P-OB-1930 and RP-P-

OB-1962 respectively. The inks in both prints demonstrated the clear presence of iron and microscopical observation showed that two different grain sizes can be discerned in the ink, which could mean that two different pigments were mixed. In combination with the faded appearance of the prints it suggests that a mixture of yellow ochre and a blue dyestuff such as woad was used. XRF analysis at the former Central Research Laboratory, Amsterdam, project no. 94-250.
241
Nicoletta da Modena after Andrea Mantegna, *Hercules and Anteus*, printed in blue, Rijksprentenkabinet, Amsterdam, RP-P-OB-1823. XRF analysis at the former Central Research Laboratory, Amsterdam, project no. 94-250.
242
XRF analyses carried out by Peter Hallebeek, Instituut Collectie Nederland.
243
Bosse (Paris 1645): 71.
244
Bosse (Paris 1745): 123–125.
245
Ibid.,128. For the technique of *à la poupée* printing see below under 'Printing *à la poupée*'.
246
Gautier-Dagoty 1-5 (1748, 1749, 1749, 1749, 1756). Cf. the reactions by Jean Robert and Antoine Gauthier de Montdorge; **Montdorge 1-3** (1749, 1755, 1756); **Robert 2-3** (Jean; 1749, 1756).
247
Gautier-Dagoty 1 (Dec. 1748). He also mentions ultramarine (*l'outremer*) for blue, but it is unlikely he means the pigment made from the semi-precious stone lapis lazuli, because it was far too expensive.
248
Bosse (Paris 1745): 125. Cochin refers to the anatomical plates by Gautier-Dagoty, see below, which are much harsher and bluer, while the colours in Le Blon's work are more in balance.
249
Le Blon arrived in France in 1736 and petitioned for a French patent on his invention in 1736 or 1737; **Le Blon** (Stuttgart 1985): 62–64. Before he could be granted the letters patent he had to show his procedure to a committee of the Académie des Sciences; **Le Blon** (Stuttgart 1985): 66–69. 'The report of the four experts [Messr. Dufay ... Duhamel ... Gauthier de Montdorge ... and Miss Basseporte] and the Royal confirmation [dated 12 October 1738] have not yet been found'; **Le Blon** (Stuttgart 1985): 69. The text on pp. 105–111 of the 1756 volume, however, is close to the excerpt of the report Montdorge wrote on his visit to Le Blon's studio in 1738 and which he cited in his article in the *Mercure de France* of July 1749; **Montdorge 1** (1749): 175–176. This gives the impression that the second part of this book is a reworked version of this report. This would provide even greater support to the supposition that Le Blon invented a fourth black plate, as it would have been described in the report of 1738. On p. [1] at the end of the book Duhamel du Monceau and Gauthier de Montdorge refer to this report. The demonstration must have been carried out between 28 January and 1 April 1738; **Le Blon** (Stuttgart 1985): 66. The report was probably written before 1 April 1738. **Montdorge 1** (1749): 174: *un Mémoire, que feu M. du Fay m'engagea à faire pour l'Académie des Sciences, dans le tems que le Blond sollicitoit son Privilége.* This is probably the same report. Cochin already refers to an extra plate to strengthen a colour, more particularly for printing the deeper shades in umber or black; **Bosse** (Paris 1745): 125.
250
Le Blon (Paris 1756): 114–124. De Montdorge cooperated with two of Le Blon's apprentices, Jean Robert and Pierre François Tardieu, who produced pl. 2; Robert announced the treatise in an article; **Robert 3** (Jean; 1756): 211.
251
Halle 1761: 224. The same colorants are repeated by later German authors.
252
Bylaert (Leiden 1772): 56 and 58. Two-colour prints in black and red by him are known.
253
Laurie (1784): 148. The same remark can also be found in **Berthiaud** (Paris 1837): 92 and **Goulding** (Sterling 1910): 76.
254
Berthiaud (Paris 1837): 92; *Lehmann 2000*; **Netto** (Quedlingburg 1840): 70–71.
255
Pyle (New York 1941): 83.
256
Bosse (Paris 1637): fol. 138v; *Bury 2001*: 47; *Pagani 2008-1*: 18 no. 453 (?).
257
Querfurt (Vienna 1792): 157–160. Perhaps this was just an idea by Querfurt and not applied in practice. For *aurum musivum* see: *Kühn et al. 1984*: 241–242.
258
Aanwinsten 2002: 83–84 no. 11; **Berthiaud** (Paris 1837): 127–128; *Van de Waals 2006*: 29 cat. 10–11.
259
Prestel 1782, pl. 24, reproduction in reverse of the original drawing formerly in the Praun Cabinet, Nürnberg, now in the Albertina, Vienna, inv. 1658. The pigments of the print were analysed using X-ray diffraction (XRD): the metal was found to be gold (Au), and the brown, which contained iron (Fe), was confirmed as an ochre; *Hallebeek et al. 1994*.
260
Berthiaud (Paris 1837): 125–126. Bronze powder was used abundantly in this way in nineteenth-century relief and lithographic printing; *Bloy 1967*: 92–93; *Gerhardt 1982*: [5]–[10]; *Van Cleef 1974*: 146; *Wiborg 1926*: 245; *Woodcroft 1969*: 364, 418–419, 486, 489.
261
Gerhardt 1982: [8], [15]; *Gerhardt 1984*: 145–146; *Carter et al. 1983*: 1–2.
262

Bloemsaat 2008; *Bloy 1967*: 92–93; *Gerhardt 1984*; *Moxon 1978*: 301–302; *Stijnman 2009*: 29; *Van Cleef 1974*: 146; *Wiborg 1926*: 245. Silver leaf would also have been used but no examples are recorded.
263
Bloy 1972: 92–93; *Gerhardt 1982*; *Seymour 1910*: 70–74.
264
Charbonnel 2000.
265
Ellis 1940: 358–359.
266
Smith 1984. Suppliers are Bumpodo (Japan), Lefranc & Bourgeois (brand name Charbonnel, France) and Rostow & Jung (brand name Akua Intaglio, USA). Lefranc & Bourgeois use a bronze- (brass?) based pigment for gold-coloured ink and an aluminium-based pigment for silver-coloured ink; *Charbonnel 2000*: 13. The metal may be called 'bronze', but it concerns copper-zinc alloys (brass) or aluminium; flake, instead of grain powder is preferred; *Apps 1958*: 424. Mixing the aluminium powder with red shade yellow dyestuffs may also result in a gold colour; *Askew 1969*: 318. Winsor & Newton presently supply a 'gold' acrylic paint, which is mica coated with titanium white and yellow ochre; information on tube.
267
See Chapter 2, p. 112.
268
See Chapter 2, p. 102.
269
The range of nine black Charbonnel inks differ in formulae and wiping performance; all coloured inks are available in one formula only; *Charbonnel 2000*. All other ink manufacturers supply one or just a few blacks and one variety of ink per colour, probably because it is not economically feasible to supply different varieties per colour.
270
Cutner (London 1947): 76–77; **Lumsden** (London 1925): 85–87; **Pyle** (New York 1941): 80–82; **Strang** (David; London 1930): 77–80.
271
For the grinding of the pigment see above under 'Frankfurt black'.
272
Cutner (London 1947): 77. This is also my experience.
273
Goulding (Sterling 1910): 87–89.
274
Lumsden (London 1925): 86 fig. 34. See also: **Brunsdon** (London 1965): 26.
275
Bosse (Paris 1645): 67: explains how to grind on a marble slab. **Zonca** (Padoua 1607): 77: first the pigment is ground finely with water on a porphyry slab, next the ink is ground (when the pigment is dry) probably on the same stone. The 1680 inventory of Domenico Tempesti's printshop includes a porphyry as well as a marble ink stone. Berthiaud uses the word *marbre* as a general term for the ink stone, and refers to a black granite stone he once saw which worked well; **Berthiaud** (Paris 1837): 55. Lithographic stones, a kind of lime-sandstone, are mentioned as ink stones, too, in the twentieth century; **Robins** (London 1922): 208; **Strang** (David; London 1930): 72. Their hardnesses vary, the yellow ones being softer and the blue ones harder, but in general they are too soft for grinding, they wear fast and stone particles mix with the ink causing increased plate wear in inking and wiping. Lithographic stones are suitable for mixing ready-prepared inks.
276
Berthiaud (Paris 1837): 55.
277
Berger 1973, 162–163; *Faidutti & Versini 1970*: 51.
278
Gessner (Leipzig 1740–1745) 3: 456: *Wenn man ein halb Pfund auf dem Reibestein zerknirschet, oder zerrieben, so thut man ohngefehr darzu die Helffte des siebenden Theils eines Maß*.
279
Berthiaud (Paris 1837): 55; *Champour & Malepeyre 1895*: 332–333, 335–338; **Lalanne** (Boston 1880): 72; *Voit 1786–1790*, 2: 97.
280
Goulding (Stirling 1910): 87.
281
See Chapter 2, p. 112.
282
Printing 1878: 158, mentions Alauzet & Co exhibited 'Ink-grinding Machines' without giving further details.
283
Deleschamps (Paris 1836): 163.
284
See above under 'Oil varnish'. Although machine-made intaglio ink was available on the market, plate printers and printmakers continued to prepare their (black) intaglio inks manually until the early twentieth century; **Goulding** (Stirling 1910): 73–76; **Lumsden** (London 1925): 85–88; **Profit** (Paris 1913): 111.
285
Champour & Malepeyre 1895: 334–335.
286
Seymour 1910: 46.
287

Hoskins 2004: 38–40.
288
Charbonnel 2000: 14. Charbonnel black no. 55985 contains oil varnish of 200 *poise*.
289
Ibid., 8; *Finley 1997*: 240–244.
290
Charbonnel 2000: 13.
291
Goulding (Stirling 1910): 89.
292
Berthiaud (Paris 1837): 56; **Bosse** (Paris 1645): 68. Earthenware pots for varnish and ink (*aerde fernis en inck potten*) are mentioned in a manuscript from 1742; Museum Plantin Moretus, Antwerp, Arch. 697, no. 55. English translations in: *Dyson 1984*: 83; *Phillips 2003*: 19 (after *Dyson 1984*).
293
Goulding (Stirling 1910): 89; **Longhi** (Hildburghausen 1837) 2: 175. Industrially manufactured inks were supplied in tin cans by the later nineteenth century. **Lalanne** (Paris 1897): [5] front: advertisement from the firm of Lamour for intaglio printing materials; the ink was sold per box (*boîte*) of 250 g for 5 francs. Supplement to the *British Printer* (1898): 326, advertisement for: 'Mander's patent screw press and patent tin, for small users of printing inks.' The picture shows a can with a small nozzle at the bottom and on top a screw. When the screw is turned a plate inside the can moves downward, thereby forcing the ink through the nozzle. This uses the same principle as a collapsible tube, ie because the surface of the ink is not exposed to air the ink does not dry.
294
Zonca (Padoua 1607), pl. on p. 76, no. P is described on p. 78 as *vase di tinta*. **Bosse** (Paris 1642);
295
Gessner (Leipzig 1740–1745) 3: 457.
296
Bosse (Paris 1745): 144–150, pl. 19.
297
Chattock (1880–1882), 3: 22; **Cutner** (London 1947): 76–77; **Lumsden** (London 1925): 85–88; **Plowman** (New York 1914): 129–130; **Poortenaar** (Amsterdam 1930): 53–58; **Short** (London 1888): 27; **Strang** (David; London 1930): 75–90.
298
Brunsdon (London 1965): 8; **Lalanne** (Boston 1880): 72; **Poortenaar** (Amsterdam 1930): 58. This could be done for short periods, Strang states that it 'will keep in good condition for a week or more'; **Strang** (David; London 1930): 80. No earlier references to covering intaglio ink with water have been found therefore it is considered that the practice developed only in the later nineteenth century. In his poem on ink making for the book printer in Gessner's work, Heinrich August Wildenhayn advises pouring some water on the ready-prepared ink to keep out the dust; *Bloy 1967*: 104 no. 13, 106 no. 15; **Gessner** (Leipzig 1740–1745), 1: 81 at the back.
299
When the water sits on the ink for longer periods, and the ink is kept in a tin box, the box starts to rust and a greyish gel-like layer forms on top of the ink. After pouring off the water some drops of water remain on the ink, which have to be removed to prevent them from being mixed in the ink causing faulty lines in the print.
300
Goulding (Stirling 1910): 89.
301
In 1994 I opened not a tube but a small Lefranc & Bourgeois tin ink box from the beginning of the twentieth century, then owned by the father of mezzotinter Joop Vegter. After 90 years the ink had absorbed what little oxygen there was above the ink surface, but no further oxygen had entered the box and consequently there was no skin on the ink and it was still usable. Goulding advocated storing freshly ground ink in tubes, although Hardie, the editor of Goulding's text, remarked that this was not common and that 'in ordinary circumstances most etchers (and it was Mr. Goulding's own practice) grind daily the ink required for each plate'. **Goulding** (Stirling 1910): 89.
302
Barrow recommended researching printing ink recipes in order to be able to better understand the effects of printing ink on paper; *Barrow 1978*: 51. The following paragraph is a summarised version of: *Stijnman 2001-2*. With thanks to Luiz Pedersoli for commenting on the chemistry of the long-term drying processes.
303
Apps 1958: 14ff.
304
Von Bartsch 1821, 1: 8.
305
Longhi (Hildburghausen 1837) 2: 172, *Seidenpapier*; **Schwarz** (Nürnberg 1805): 94–95, *Seidenpapier*.
306
Daniels 1990; *Hallebeek et al. 1998*; *Whitmore & Bailie 1990*. I have observed this effect only in volumes printed on nineteenth and early twentieth-century paper and with mounting board of the period; it does not appear in older bound volumes of prints.
307
Maraval & Flieder 1993.
308
Traces of mould can be observed under high magnification.
309
Schmutzler 1999; *Skaliks 2000*.

310

This paragraph is a revised version of *Stijnman 1996-1*. For other literature on the history of the roller press see: *Bain 1988*; *Dyson 1982–1983*; *Kamitani 2009*; *Lilien & Gerhardt 1978*: 86–98; *Meier 1941*, 2: 164–205, 3: 338–374, 4: 496–527. See also: Chapter 2, p. 113.

311

For modern presses see: *Klein 1977*: 61–62, item 'Drukken'.

312

The roller presses manufactured by TofKo are constructed to withstand a pressure of 250 kg/cm²; personal correspondence with Mogens Tofte Koch, director of TofKo, in 1995; personal correspondence with Hugo Bos, director of Polymetaal, over the years.

313

The amount of flattening and expanding is in direct relation to the pressure exerted: the more pressure the more expansion. The extremes of the plate may also curve upwards; **Hamerton** (1875).

314

An exact calculation of how much pressure is actually exerted on the plate, where and at the moment when it passes underneath the roller is difficult to calculate because of all the variations and changes in the process.

315

See below under 'Rubbing'.

316

See Chapter 1, p. 39.

317

Bosse (Paris 1645): 57–61, pl. 11–14.

318

Tempesti (Firenze 1994)*:* 45–46, 167. Tempesti may have owned a copy of Bosse's manual, because he referred to it and if so would have taken it back to Florence. For him, Bosse cannot be improved, but we would also like to know about the habits in his home town.

319

See Chapter 2, p. 113.

320

See Chapter 1, p. 62.

321

Meier 1941: 352–353, 496; *Reti 1974*: 173; *Stromer 1988*: 146.

322

Meier 1941: 496; *Stromer 1988*: 146.

323

Meier 1941: 52; *Reti 1974*: 175.

324

Pantheo 1530: fol. 23r.

325

Singer et al. 1954–1984, *2*: 47; *Stromer 1988*: 146. Notice also the bolt through the lower part of the press to keep the cheeks of the frame together and the spanner for turning the nut, both of which are also present in Bosse's press design of 1645; **Bosse** (Paris 1645), pl. 11.

326

Landau & Parshall 1994: 30; *Meier 1941-3*: 499; *Van der Stock 1998*: 337–339; *Verheyden 1910*: 195. The debt was settled within three years, and the 24 copper plates and the press with its equipment returned; *Van der Stock 1998*: 345–346.

327

Sambucus 1566, *2002*.

328

Ibid., 247: *Qvis neget inuentum Germanorum ingeniosum // cartula quo recipit tot monumenta typis?*, Who does not know the ingenious invention of the Germans, by which paper receives so many monuments by means of letters? The emblem is not in the Dutch (1566) or French (1567) translations, which are after the first edition. In all later editions the emblem is on p. 281. Cf.: *Stijnman 2010-2*: 25–27**,** Appendix 1.

329

Errard 1584, pl. 28; *Verantius 1616*: 15–17, pl. 46; **Zonca** (Padua 1607): 76–78 (see Fig. 225).

330

Stijnman 2010-2: 11–25.

331

Zonca (Padua 1607): 78.

332

Bolland & Poirters 1640.

333

Houtvademecum 1965: 109; **Zonca** (Padua 1607): 77.

334

Servin 1620, pt. 3: 2.

335

Lucas Jansz Waghenaer, *T'eerste deel vande Spieghel der zeevaerdt (etc.)*, Leyden: Christoffel Plantijn (printer), 1584; *Waters 1989*.

336

Duverger 1984: 37: *een cleyn druckpersse met synen toebehoirtten*.

337

Een cunst pars met een halve cunstpars; *ANF 1883*, 15: 2; *Alting Mees 1913*: 190.

338

Bosse (Paris 1645): 58–75.

339

The Royal French foot was 32.5 cm, which gives a width of about 62 cm and a height of about 160 cm.

340

Bosse (Paris 1645): 59. When the reconstruction of Bosse's press for the Rembrandt House Museum was made, the first proofs were printed without greasing the taps. This functioned, but there was considerable friction between the taps and the bearings. The press ran smoothly after greasing with mutton fat.

341

Bosse (Paris 1645): 60–61.

342

Ibid., 58; *Servin 1620*, pt. 2: 2. An inventory was compiled of the workshop of the abovementioned Tempesti in 1680 which contained *un Torchio di Noce con sue Croce*, a nut wood press with its cross; the term *Noce* probably refers to the rollers and not to the complete press; **Tempesti** (Florence 1994): 47, 167.

343

Bosse (Paris 1645): 58.

344

Discussion with master carpenter Herman den Otter who built a reconstruction of Bosse's press in the summer of 2003.

345

Bosse (Paris 1645): 58.

346

Men maeckt somwylen de Rollen oock wel van Pock-hout; **Bosse** (Paris 1662): 88.

347

Houtvademecum 1965: 114–115.

348

Proeve 1695; *Van Eeghen 1960–1978*, 3: 24. This development was not known to Cochin, editor of the 3rd edition (1745) of Bosse's manual, and consequently is not found in its translations.

349

Steneberg 1955: 145 col. 2; *Thieme-Becker*, 34, 'Van de Velde IV, Jan': 202 col. 2.

350

Glorez (Regenspurg 1699): pt. 3, fol. B3r (p. 13). All intaglio roller presses have only one cross, but Cooney mentions that it was turned by two men; *Cooney 1996*: 44.

351

The use of spindles was first explained and illustrated by De Caus in 1616, see above.

352

Glorez (Regenspurg 1699), part 3, fig. opp. p. 11.

353

A press with spindles is also depicted in the coat of arms of the Nürnberg plate printers around 1700; Wolfenbüttel, Herzog August Library, Cod. Guelf. 391.5 Novi: 163.

354

Sabbe 1928: 181, 200–202; *Van Eeghen 1960–1978*, 4: 256; *Voet 1972*, 2: 221–222. See also Chapter 2, p. 114.

355

Le Blanc 1854: 356, *Nagler 1838*: 139. See above under 'Paper formats'..

356

Rollers of these widths are documented a few decades later; *Dictionnaire raisonné 1773*: 512.

357

Bosse (Paris 1745): 131–144.

358

See Fludd's notice above.

359

Bosse (Paris 1745): 135, pl. 15. A comment in a copy from a private Portuguese collection opposite plate 15 reads: *O cilindro superior de Torculo de estampor devetir de diametro 6 polegadas es inferior 7 polegados*.

360

A cheek with one hole only was already seen half a century earlier; **Filleau des Billettes** (Paris 1693–1698): 147–153, pl. [3], note that the rollers are still of equal diameter.

361

Bosse (Paris 1745): 138. Elm wood is softer than nut wood; *Houtvademecum 1965*: 66–67, 70–71. Apparently Cochin was not informed about the use of *bois de Guajac* for rollers.

362

Berthiaud (Paris 1837): 13, 17. When such a lower roller is turned to an upper roller it may give problems as the wood is soft and one wonders if Cochin has considered this.

363

Gessner (Leipzig 1740–1745) 3: 410.

364

Ibid., 454.

365

Ibid., 404. Here again there is no reference to *bois de Guajac*.

366

For an earlier example see Sambucus's press with a six-armed cross (see Fig. 227).

367

A press with a six-armed cross is also shown in the Austrian *Schauplatz 1774*, 1: pl. 10. The Austrian Thomas Querfurt describes presses with four and six arms, each of which are 3 ft in length; **Querfurt** (Wien 1792): 148.

368

Stijnman 1996-1, appendix nos. 7, 9, 10.

369

Reinhold 1788: 280: *es widmen sich dieser Kunst oft selten andere, als grobknöchichte Leute*.

370

Voit 1786–1790, 2: 92–105 fig. 9.

371

There is more that does not make sense in this picture; see for example the printer on the right who has only one leg.

372

Voit 1786–1790, 2: 103.

373

See Chapter 2, p. 76.

374

Schellenberg (Winterthur 1795): 41.

375

Ibid., 41–43, Tab. 1.

376

See above under 'Paper formats'.

377

Querfurt (Wien 1792): 147.

378

The rollers of the wooden press in the Musée de l'imprimerie et de la banque in Lyon have a width of 87 cm, the rollers of that in the Chalcographie du Louvre in Paris measure about the same. See: *Stijnman 1996-1*, appendix nos. 6, 7 and 14.

379

Stijnman 1996-1, appendix nos. 5 (40 cm), 8 (45 cm), 9 (43 cm), 10 (56 cm), 11 (54 cm), 12 (27 cm).

380

Wolf 1990: 450–482.

381

Woodcroft 1969: 108, English patent, A.D. 1803, 28 February.–No. 2683 (*four*).

382

Such a mechanism was also attached to a nineteenth-century Austrian press designed for printing papers of value; see: *Stijnman 1996-1*, appendix no. 13.

383

Berthiaud (Paris 1837): 307–310.

384

Perkins 1 (1810): 264–265, pl. XIV; *Woodcroft 1969*: 122–123, English patent, A.D. 1810, 1 October.–No. 3385. Dyer's reference to 'calicoe printers' again shows intaglio printing is indebted to textile printing.

385

Letter from Basil Hunnisett, 9 July 1996. For the full-metal version of this press by Perkins and Murray see below under 'The metal roller press, 1800–2000'.

386

An iron element very similar in design can be seen in an English design for a cast-iron press with a six-armed wooden cross by J.R. and A. Ransome of Ipswich from the 1840s; *Hunnisett 1980*: 185.

387

A press with the same characteristics and some identical details – a general slender design, an extra shelf underneath the upper crossbeam, a six-armed cross, clamps, double openings for metal bearings, laminated rollers with iron axles, feet with square ends but without a gearing – is in the collection of the Rembrandt House Museum in Amsterdam. Both presses have provenances that go back to English engravers, respectively Charles William Sherborn (press, Science Museum) who used it from 1875 until his death, and Arthur James Lewis (Rembrandt House Museum); letter from Derek Hudson, Science Museum, 7 March 1996 and letter from Frits Lugt to J.F. Backer of 10 May 1920 in the archives of the Rembrandt House Museum.

388

Barth = **Longhi** (Hildburghausen 1837) 2: 165–168; **Berthiaud** (Paris 1837): 13–38, 267–269, 288–304; **Netto** (Quedlinburg 1840): 71–72, afb. 34; Thon = **Perrot** (Ilmenau 1831): 258–262.

389

Stijnman 1996-1: 15–18.

390

Berthiaud (Paris 1837): 12: *nous décrirons les changemens qu'on y a faits depuis peu d'années*.

391

Dyson 1984: 95–96, 176–177.

392

Jacque (1852): 237.

393

Dyson 1984: 87.

394

Norbert Goeneutte portrayed his colleague Henry Guérard bent over a print freshly pulled from his wooden press in 1888. Guérard's visiting card shows him at this press; *Verhaak 1990*: no. 17. Alf Depser printed on a wooden roller press from the first half of the twentieth century; his press is kept in the collection of the Kunstkreis Norden, Germany.

395

Lumsden (London 1925): 20.

396

Silsby (New York 1943): 22–23.

397

Stijnman 1996-1, appendix, presses nos. 5, 11 and 14 were in use when I was researching them. A reconstruction after the designs in **Bosse** (Paris 1645) has been in permanent use in the Rembrandt House Museum in Amsterdam since September 2003; *Otter 2009*. A reconstruction after the designs in Bosse (Paris 1745) is kept in the Arie Collegio Hall in Minamishimabara, east of Nagasaki, but it is only occasionally used for printing demonstrations; with thanks to Sanae Yamamoto for bringing me to this press. A historic style roller press is kept by the Deutsches Museum in München. See: *Wolf 1990*: 732, who cites *um 1820*, although the press was actually built in 1948; letter from Winfrid Glocker, Deutsches Museum, 24 July 1996. Steven Manning, cabinet maker, reconstructed a wooden roller press for the University of York in 2012; personal correspondence with Steven Manning in 2012.

398

Stijnman 1996-1, appendix no. 15; personal correspondence with Louis Richebé in 1996.

399

Moran 1978: 49; *Wolf 1990*: 462–468; *Woodcroft 1969*: 22.

400

Filleau des Billettes (Paris 1693–1698): 165, pl. 4.

401

The same system was suggested in: **Netto** (Quedlinburg 1840): 71–72, pl. III, fig. 34.

402

Errard 1584, pl. 28; **Zonca** (Padoua 1607): 76–78.

403

Bathe & Bathe 1943, fig. XX (top) opp. p. 90. Whether this press was actually operated is not known. Not in *Woodcroft 1969*. Presses with metal rollers used for flattening strips of soft metal have already been mentioned above. Iron presses with case-hardened steel rollers came into use for flattening copper plates in England around 1800; *On Rolling Copper 1814*.

404

Perkins 2 (1820): 165–167; *Woodcroft 1969*: 145, English patent, A.D. 1819, October 11.–No. 4400.

405

See Chapter 3, p. 134.

406

Bain 1966: 18; *Harris 1968–1970*, 4: 72–73; *Lilien & Gerhardt 1978*: 93, 97.

407

Solly (1819): 55–59; not in *Woodcroft 1969*.

408

Cartwright (1824); *Woodcroft 1969*: 171–172, English patent, A.D. 1824, July 27.–No. 4992 (two).

409

The practical details were probably too complicated to overcome at the time to be able to actually build such a machine so it remained just a patent.

410

Solly (1819): 52, 55.

411

American patent granted to Cyrus Durand, New York, May 22, 1828; **Durand** (1828).

412

A photograph of a cast-iron press very similar to this one, including the hydraulic pressure system, is reproduced by Dyson. A simpler model, designed by J.R. and A. Ransome of Ipswich, without hydraulic pressure screws and with a six-armed cross is shown in a drawing from the 1840s; *Dyson 1984*: 106–108, pl. 63, 64; *Hunnisett 1980*: 182–185, pl. 54–56.

413

Eder 1922: 79.

414

Chattock (1880–1882), 3 (1881): 20.

415

The zinc plate will stretch and buckle in use because of which it has to be replaced regularly. With modern metal press beds a sheet of plastic is positioned on the bed, which is replaced easily and cheaply.

416

Chattock (London, 3rd ed., 1886) 54; *Dyson 1984*: 107 pl. 63, 176–177 has bills for turning rollers and planing beds. http://www.mtsu.edu/~art/printmaking/wwwboard/index.html (7 February 2000, no longer accessible), posting by Hugo Bos, director of Polymetaal press manufacturers, 'Remarks about beds of etching presses'.

417

No such patents in *Woodcroft 1969*, nor found elsewhere in the literature.

418

Edlem von Keeß 1823, 2: 41.

419

Lilien & Gerhardt 1978: 97.

420

Jöntzen (1836).

421

Because of the bronze bearings the wooden roller would have had an iron axle. Note that in early lithography roller presses were used for printing the stones and that etchings can be printed by means of the scraper bar in a lithographic press.

422

Woodcroft 1969: 374–375.

423

The scraper bar is replaced by a roller for intaglio printing and vice versa; **Brunsdon** (London 1965): 120 no. 10; **Ross & Romano** (New York 1972): 288; *Van Ginkel 1987*: 100.

424

See for example: **Nouveau procédé de gravure sur acier** (1821), which has short descriptions of Perkins's inventions for steel engraving, duplicating intaglio plates and a mechanical intaglio press. The editors of the *Annales de l'industrie nationale et étrangère* commented that all these had already been invented in France and were in use. A year later they published a translation of an article by Perkins, Fairman and Heath on steel engraving, this time with positive comments, although explaining that steel engraving had already been performed in France in 1810, see further under Chapter 3, p. 134; **Perkins 4** (French ed. of 1822).

425

Berthiaud (Paris 1837): 33–36.

426

Nouvelle presse mécanique en fonte; **Berthiaud** (Paris 1837): 267–269, pl. 3 fig. 1.

427

For manufacturers of metal presses see Chapter 2, p. 112.

428

See Chapter 3, p. 230.

429

Benad-Wagenhoff & Werfel 2003: 118, mechanised intaglio printing represents about 20% of the German printing market; *Finley 1997*: 298–304; *Krüger 1914*: 195–209; *Lilien 1963*, especially pp. 9–18; *Zoete 1988*: 16–17.

430

Eder 1922: 79 fig. 20; *Krause 1904*: 323; *Krause 1930–1933*: 289.

431

Dyson 1986: 67–68; **Smith** (Alan; Ramsbury 2004): 23. See: http://harryrochat.com/index.htm (2010). Correspondence with the firm of Harry F. Rochat in March 2012.

432

Brunsdon (London 1965): 120 no. 10.

433

John Maitland Graves, press manufacturer at Rembrandt Graphic Arts, 'All you ever wanted to know about etching presses', at: http://www.worldprintmakers.com/torculo/etchpres.htm (2010).

434

Hugo Bos, press manufacturer at Polymetaal, 'Remarks about beds of etching presses', at: http://www.mtsu.edu/~art/printmaking/wwwboard/index.html (posted 7 February 2000, no longer accessible).

435

See Chapter 2, p. 89.

436

See Chapter 2, p. 86.

437

Hamerton (1866): 295; **Lalanne** (Paris 1866): 83ff. See also the introduction to Appendix 4 under 'Maxime Lalanne', p. 421.

438

Roberson not only supplied Hamerton's roller press in two sizes, but also two kinds of paper, printing ink and reducing oil; *Roberson 1870*: 1. Hamerton's press was intended for amateurs and artists who wanted to prove their own plates. When master printer Frederick Goulding was asked for his opinion apparently 'Goulding pointed out with a grin that these presses were admirable, no doubt, for such plates as those which appeared in [Hamerton's] "Etchers' Handbook"'; **Goulding** (Stirling 1910): 124 n. For a similar negative comment see also: *Pennell 1936*: 216. No information on this press is available in the Roberson's Archives kept in the Hamilton Kerr Institute; letter from HKI, 30 April 1997.

439

Lalanne (Paris 1878): 15, 89 n. 1; **Lalanne** (Boston 1880): 69–70. A manual seems to have been produced for the Cadart press but I have not been able to identify such a text unless it is one of the editions of Lalanne's manual; **Roller** (Wien 1888): 92.

440

Krause 1904: 326–327.

441

Bagelaar (Haarlem 1817): 13, 22; **Kok 1** (De Bilt 1982): 41–43; **Roller** (Wien 1888): 92; **Ross & Romano** (New York 1972): 289.

442

Lumsden (London 1924): 98.

443

Roubo 1977: 964, 970–971, pl. 327, figs 3–6.

444

Paton (1892–1894), 3: 179, pl. II; **Paton** (London 1895): 107, 171–172, plans III and IV.

445

Banister (New York 1969): 36, 39, 41; **Barry** (London 1929): 26–27; **Ehrström** (Helsingfors 1924): 127–128; *Fackrell 2009*; **Kok 1** (De Bilt 1982): 41–43; **Neuville** (Paris 1975): 79–81; **Porter** (London 1933): 82–87; **Pyle** (New York 1941): 104–106; **Silsby** (New York 1943): 23–25; *Smith 2004*; **Sternberg** (New York 1949): 64–65. Doug Forsythe published the plans of his design on the CD-ROM 'Build Your Own Etching Press' (1999) and online at http://buildapress.com/ (2010), where other home-built presses can also be viewed. See also: http://www.ndiprintmaking.ca/ (2010).

446
Bosse (Paris 1645): 57.

447
Lankes (New York 1936): 49, 56.

448
Coode (1998); **Ross & Romano** (New York 1972): 289; **Kok 1** (De Bilt 1982): 40–41.

449
Böttger & **Bromeis 2** (1855); **Lalanne** (Boston 1880): 69 n. 22, referring to Potémont; *Onderdewijngaart Canzius 1820*: 12; **Potémont 1** (1864): pl. 4.

450
Diderot & D'Alembert 1751–1781, *Receuil de planches, 7e livraison, ou 8e vol.* (1771), *Laminage du Plomb*, pl. IX, X, XI and XII.

451
A rotary relief printing press is illustrated by Glorez; **Glorez** (Regenspurg 1699), pt. 3, fig. opp. p. 11. There is some discussion as to whether Bonvalet of Amiens worked with engraved copper plates bent around a cylinder in the 1750s, but this seems unlikely; *Brédif 1989*: 58; *Lilien & Gerhardt 1978*: 63; *Nadeau 1989*: 418 ('Rotogravure').

452
See above under 'Textile'.

453
Brédif 1989: 47–48, 58; *Lilien & Gerhardt 1978*: 99–106.

454
Perkins 2 (1819), invention no. 5 on pp. 167–169 with reference to pl. VIII, fig. 4, describes the partially mechanised intaglio press; *Woodcroft 1969*: 144–147, English patent A.D. 1819, October 11.– No. 4400, see no. 5 'Cylindrical steel or copper plate printing press'.

455
Lilien & Gerhardt 1978: 96–97, 263;

456
Dyson 1984: 97–98; *Woodcroft 1969*: 181–182, 343, 375–375, English patents, A.D. 1830, August 31.–No. 5988, A.D. 1853, January 18.–No. 128 and A.D. 1853, August 10.–No. 1861 (a).

457
Kupferdruck-Schnellpresse 1857.

458
Guy 1876–1877, 9 p., 2 pl. *Braun 1952*: 267–269; *Lilien & Gerhardt 1978*: 97; Cf.: *Novelties 1881*: 197, about Bradbury & Wilkinson who acquired one of Guy's machines, as already referred to in *Printing 1878*: 160; with this machine the copper plate is bent and wrapped around a cylinder for printing.

459
Beraldi 1885–1892, V: 171; *Lilien & Gerhardt 1978*: 97, fig. 48. More patents from the second half of the nineteenth century for inking and wiping machines can be found in: *Dyson 1982–1983*: 4. Bradbury & Wilkinson acquired another version of Guy's machine; **Intaglio printing machine** (1881)

460
Printing 1878: 160–161. *Volkmer 1895*: 117–129, shows designs of several rotary presses and fig. 32, a photograph taken in 1889 of such a press shows a woman working at the machine during the exhibition.

461
Intaglio printing machine (1881): 197.

462
Printing 1878: 161. This is much like the patent of Thomas Bell of 1783 for rotary textile printing.

463
For further details see Chapter 3, p. 230.

464
Lilien 1963; *Lilien & Gerhardt 1978*: 66–85.

465
For a complete and illustrated alphabetical list of all the utensils needed in the printshop see: **Berthiaud** (Paris 1837): 219–263 (*Du local et des utensiles*), pl. 2.

466
See below under 'Cleaning of the plate'.

467
G.H. (Nürnberg 1707): [7]; **Steel and iron facing** (1882): 111, col. 2.

468
Bosse (Paris 1645): 53; **G.H.** (Nürnberg 1707): [7] no. XXVI.

469
This occurs when there is too much difference in height between the top of the edge and the surface of the press bed, or, even if the facet is correctly bevelled, when the pressure is too high; **Stijnman 2** (De Bilt 1985): 71–72 no. 42A-B: 87 no. B.

470
Berthiaud (Paris 1837): 149; **Schwarz** (Nürnberg 1805): 94; *Waldow 1884*: 189.

471

Berthiaud (Paris 1837): 148–163; **Bosse** (Paris 1645): 69; *Stijnman 1992*: 70–73; **Strang** (David; London 1930): 56–71.

472

Stijnman 2 (De Bilt 1985): 45–46 no. 1K-M, 49 no. 4F, 60 no. 24, 81-82 no. 61A, 92 no. 75B.

473

See above under 'Paper'.

474

McKean-Fisher & Baxter 1983: 48–49. For a reference to soaking in petrol see: **Strang** (David; London 1930): 71.

475

The publisher's device the Augsburg publisher Wolfgang Kilian used in the 1620s shows the interior of a printshop including a big tub which seems intended for dampening paper (see Fig. 78, p. 92). Halle copied Abraham Bosse's 1643 interior of a printshop and added in the back on the right a man dampening paper; *Halle 1761*: 223. *Diderot & D'Alembert 1751–1781, Planches*, sixième livraison, ou septième volume (1769), *Imprimerie en caracteres*, pl. XIII, *Tremperie et lavage des formes*, fig. 2: this figure shows the dampening of paper for book printing and is referred to here for comparison. *Schauplatz 1774*, 1: no. 10, fig. on verso, also reproduced in: **Goulding** (Stirling 1910): fig. on p. 69.

476

Berthiaud (Paris 1837): 150–151; *Halle 1761*: 226; **Bosse** (Paris 1645): 74.

477

Berger 1973: 169; **Bosse** (Paris 1645): 69; *Halle 1761:* 226; **De Mayerne** (London 1620–1648): fol. 37r; *Faidutti & Versini 1970*: 53; **Goulding** (Stirling 1910): 89; **Roller** (Wien 1888): 89; **Schwarz** (Nürnberg 1805): 94; **Zonca** (Padoua 1607): 76, 78 no. T (see Fig. 225).

478

Smith (Allen; Ramsbury 1974): 95–99; **Stijnman 2** (De Bilt 1985): 23–24; **Strang** (David; London 1930): 57–58.

479

Strang already mentions the use of 'rubber sheeting', which he preferred to the use of glass plates; **Strang** (David; London 1930): 58.

480

See above under 'Paper'.

481

Bosse (Paris 1645): 69; **Schwarz** (Nürnberg 1805): 94; **Schall** (Leipzig 1863): 43. The maximum is five days in dry cool weather after which mould starts to grow on the paper causing stains. This occurs faster in damper and warmer conditions.

482

Berthiaud (Paris 1837): 151.

483

Bowles (London 1760): 33.

484

Strang (David; London 1930): 60–67.

485

Howard (Rochester, 2nd ed., 2003): 76.

486

Berthiaud (Paris 1837): 163–164, half an hour is enough for parchment; **Smith** (Allen; Ramsbury 1974): 100; **Strang** (David; London 1930): 67.

487

When damp paper dries again it shrinks. The amount of stretching and shrinking differs with the type of paper and even per sheet. A typical problem in describing prints is that different impressions of the same plate may differ in size, which may be caused by this stretching and shrinking. The difference may be a few millimetres for sheets about 30 cm long to a full centimetre for a sheet of 80 cm. With handmade paper the percentage of expansion and shrinkage is about the same in both the horizontal and vertical directions. With machine-made paper on a web the paper fibres generally follow the direction of the movement of the web, expanding more at the straight angles. A mounted print may also expand again when kept under humid conditions, and a skilful paper conservator may be able to manipulate the paper format by dampening and drying the sheet.

488

Burr 1993; **Ross & Romano** (New York 1972): 286, top image. **Ross & Romano** (New York 1990): 283. A hydraulic intaglio press was designed and constructed by American master printer Kenneth Tyler 1988–1990; http://en.wikipedia.org/wiki/Kenneth_E._Tyler (2010). Quite a number of printmakers use a construction with a hydraulic bottle jack; *Collier 1993*; search the Internet for 'bottle jack press'.

489

For the grinding of the ink see above under 'Preparing by hand'.

490

See Chapter 2, p. 112.

491

The drying time of a colour ink depends on the kind of pigment used and on the possible addition of driers.

492

Apps 1958: 5; *Bisset et al. 1979*: 364–369. The opposite is 'dilatancy', when an ink becomes stiffer upon agitation which happens with over-pigmented inks.

493

See Chapter 2, p. 112.

494

Goulding (Stirling 1910): 72.

495

Instead of cards (ie pieces of cardboard), strips of felt or leather are also found, both materials being sufficiently flexible. They have to be replaced every few years, depending on use. Small flexible concave steel dishes act as stiff springs and are long-lasting.

496
Stijnman 2 (De Bilt 1985): 61 no. 26.
497
Vintage impressions of fifteenth and early sixteenth-century plates may be of poorer quality than later impressions due to the quality of the felt.
498
Schwarz (Nürnberg 1805): 93.
499
Kok (De Bilt 1982): 36; **Smith** (Allan; Ramsbury 2004): 22.
500
Bosse (Paris 1745): 129; *Halle 1761–1765*, 1: 223–228, pl. VII; *Krünitz 1792*: 238. For further explanation about the felt see above under 'Preparation of the press'.
501
Longhi (Hildburghausen 1837) 2: 170; **Schantz** (Stockholm 1966): 67.
502
A 'maculature' sheet is a misprint (which is discarded) usually because not enough ink was picked up from the grooves.
503
Bosse (Paris 1645): 63; *Halle 1761*: 226.
504
For detailed explanations illustrated with series of photographs of modern working methods see: *Degaast & Frot 1934*: 145; **Smith** (Allan; Ramsbury 2004): 111–126.
505
Bosse (Paris 1645): 70; **Dossie** (London 1758) 2: 196; *Halle 1761:* 226; **De Mayerne** (London 1620–1648): fol. 37r; *Berger 1973*: 167; *Faidutti & Versini 1970*: 53; **Querfurt** (Vienna 1792): 154.
506
Marciana manuscript (Gaeta 1570): fol. 157v–158r, recipe [330]: *con le dita si va mandando negli intagli*; *Seccaroni 2005*. See also: **Longhi** (Hildburghausen 1837) 2: 171.
507
Steel (London 1938): 56.
508
Bosse (Paris 1645): 65. The dabber is still in use, the roll of textile now being kept together by wrapping it with adhesive tape.
509
Bosse (Paris 1645): 70; **Longhi** (Hildburghausen 1837) 2: 169; **Smith** (Alan; Ramsbury 2004): 113; **Stijnman 2** (De Bilt 1985): 77–78. Cochin advised placing the dabber in its own space protected from dirt; **Bosse** (Paris 1745): 145.
510
Berthiaud (Paris 1837): 306, *brevet d'invention* of M. Degrand of Marseille for an *encrier*, which is a kind of roller; *Bloy 1967*: 56–57; *Janssen 1986*: 179, n. with l. 621. A roller has two handles, similar to a rolling pin or the roller used in inking lithographic stones, and a brayer is a roller with one handle; with thanks to Barbara Carr for explaining English terminology.
511
The first rollers were made of gelatin with other materials, called 'composition'; *Janssen 1986*: 179, n. with l. 621. Later in the century rollers covered with natural rubber (latex) were introduced; *Woodcroft 1969*: 410, English patent, A.D. 1854, January 16.–No. 99, Philip Grant, *An improved roller used in the processes of letter-press, copper-plate, and lithographic printing*. Felt-covered rollers appeared in the 1920s; *Pennell 1936*: 204; **West** (London 1932): 30–31. Gelatin and plastic rollers, and rollers with a wooden core covered with leather or a kind of synthetic rubber are still in use.
512
Smith (Alan; Ramsbury 2004): 113–114.
513
Zinc plates are more difficult to wipe and hold more plate tone; *Guérin 1945*: 52. Steelfaced plates wipe more easily and hold less plate tone; **Chattock** (1880–1882) 4: 4.
514
Humphrys had received the Gold Isis Medal in 1826 for his work on mordants for etching steel; **Humphrys** (London 1826).
515
Joubert (1858): 20.
516
Bosse (Paris 1645): 64, *Des linges … nommez torchons*; **Bosse** (Paris 1745): 156, *Morceaux de vieux linge … des torchons*; p. 176, *Linges blancs de lessive*. *Bruwaert 1914*: 840, referring to a letter from Jacques Callot of 1618, *linge*; p. 844, referring to an order by Jacques Callot, *de linge blanc*. *Dictionnaire raisonné 1773*: 513, *vieux linges*. **Dossie** (London 1758) 2: 197, 'cloths or clouts made of old linnen'. **Longhi** (Hildburghausen 1837) 2: 169, *verwaschener Leinwand … auch … Baumwollen- oder Seidenzeug für sogenannte Tondrucke*. *Voet 1966*: 234, quoting from the notebook of Franciscus Johannes Moretus of 1758, *lijvaert vodden* (linen rags).
517
Chattock (1881) 3: 20 no. XI, 'muslin … of two sorts – one very open ... the other fine and soft'. **Compendium** (London 1797): 201 'coarse gauze canvas'. **Lalanne** (Paris 1866): 84, *mousseline roide*. Koehler in his translation of **Lalanne** (Boston 1880): 71, mentions 'fine Swiss muslin, cheese cloth, old curtains, old cotton shirting'. **Menpes 1** (1889): 330, 'coarsish French muslin'. **Paton** (1893–1894) 3: 179, 'stiff French muslin of the sort that our grandmothers made their crinolines of, stiff book muslin of the coarsest quality made in Glasgow, soft white muslin called "butter cloth"'. *Waldow 1884*: 189, first *Straminlappen* and next *Musselin*.
518
Chattock (1880–1882), 3: 22; **Goulding** (Stirling 1910).

519

Greppi 1977: 48–49 no. 5

520

After all, Segers was a painter and not an engraver or a printer. He may have acquired black ink from a professional plate printer, but would have ground his own coloured inks, or even better, paints.

521

See above under 'Preparation of the ink'.

522

First reference: *Berger 1973*: 162–163, 166–169; *Faidutti & Versini 1970*: 51, 52–53; **Mayerne** (London 1620–1648): fol. 34r, 36v–37r.

523

See Chapter 2, p. 96.

524

Lumsden (London 1925): 64, refers to an electric heater in 1908.

525

Bosse (Paris 1645): 70; *Servin 1620*, pt. 1: 12 and pt. 2: 2. Wiping is usually done with one hand, but there are some references to wiping with both hands; *Buys 1769–1778*: vol. 6 (1774): 265; *Chambers 1786–88*, 4: 'Method of PRINTING from copper plates'; *Dictionnaire raisonné 1773*, 2: 514. The soft part of the lower arm may be used for the final touch; **Buonaccorsi** (1913): 21.

526

Whiting is fine chalk powder used in the eighteenth century for whitewashing the walls; *Augustin 1768*: 403–404. A list of the tools belonging to Caspar Courtoy, plate printer with J.J. Moretus in Antwerp, compiled in 1742, mentions *een krijt ende inck baxken*, a small box for chalk and ink. Perhaps whiting is meant here. See: Museum Plantin Moretus, Antwerp, Arch. 697, no. 55. English translations in: *Dyson 1984*: 83; *Phillips 2003*: 19 (after *Dyson 1984*). **Bosse** (Paris 1745): 146, *blanc d'Espagne*. Whiting is often referred to hereafter until the present day. Nowadays food-grade chalk powder is used.

527

Holleman found chalk powder too abrasive for the extremely fine structures of his plates and used alum powder and rice powder instead, see: **Holleman** (Utrecht 1927): 18–19. Jeweller's rouge is the finest quality red iron oxide (Fe_2O_3) powder, used for polishing gold. Sensitive plates are cleaned with whiting or white chamois-leather shavings (*mit weißem Waschleder*); **Schad** (Augsburg 1800): 43 n.*.

528

Bosse (Paris 1745): 147–148, *de l'eau commune*, some printers use stale urine, which the editor (Cochin) condemns because it harms the copper plate; *Chomel 1778*, 5: 2718; *Deutsche Encyclopädie 1778–1804*, 7: 675 col. 2-676 col. 2; **Dossie** (London 1758): 199; **Gessner** (Leipzig 1740–1745) 3: 451, item: *Lappen, Wischlappen*; p. 453, item: *Potasche*. *Halle 1761–1779*, 1: 225; **Querfurt** (Wien 1792): 155; **Schad** (Augsburg 1800): 42–43; **Schellenberg** (Winterthur 1795): 48–49, he never noticed that the plates were harmed by wet wiping; *Voit 1786–1790*, 2: 97; *Waldow 1884*: 189.

529

Joseph Hecht considered it undignified for an artist-printmaker to wipe his plates wet, because it gave a 'hard and dry aspect to the print'; **Hecht** (1994): 58.

530

Dossie (London 1758) 2: 199, translated after Cochin = **Bosse** (Paris 1745): 147.

531

Von Bartsch 1821, I: 9. According to Bartsch the plates also wore faster by being wiped wet.

532

Copies in the Herzog August Library, Wolfenbüttel, 7 Geom. 2° (2) (Latin edition, Lyon 1582) and Od 2° 3 (German edition, Mümbelgart 1595) were consulted. Deliberately left plate tone can also be observed in pl. XLV of their Italian edition of 1582, 7.2 Geom. 2°.

533

Some later impressions of the plate of the *Three Crosses* do not show this play with ink, meaning that the wiping was then performed indiscriminately by a plate printer who simply cleaned the plate without due regard to the effects Rembrandt had created.

534

Von Bartsch 1797, 1: XXXVII–XXXIX.

535

Ibid., XXXVII n.

536

Haden 1 (1866): 160. The phrase 'palm of a duchess' is often cited by later authors, but always only partially and out of context.

537

Hamerton (London 1881): 86.

538

Je suis maître devant ma plaque, comme devant ma toile; je puis transformer tous les sujets suivant ma fantaisie, modifier leurs effets; *Saint-Arroman & Lepic 1876*: 113–114. See also: *Beraldi 1885–1892*, IX: 143–145.

539

Intaglio printing machine (1881). This is the machine patented in France by Guy in 1876 and shown by him at the Exposition Universelle in Paris in 1878; see above under 'Mechanisation of intaglio printing'.

540

Goulding (Stirling 1910): 80–81, 96–98.

541

Potémont 1 (Paris 1864), pl. 4.

542

In all later editions it is no longer Delâtre who guides the reader around the workshop, but just a printer (*l'imprimeur*).

543

Lalanne writes *retroussage* (p. 85) and *retrousser* (p. 86); **Lalanne** (Paris 1866): 83–94. Delâtre used the term *estompage*; **Delâtre** (Paris 1887): 31. English terms found are 'coaxing', 'dragging (up)', 'pumping' and 'stumping'.

544

Beraldi 1885–1892, V: 172–173.

545

Haden 1 (1866): 160 n.

546

Goulding (Stirling 1910): 58–66.

547

Hopkinson 2002; Naylor 1975: xi.

548

Murray 1880.

549

Hamerton (London 1871): 70–71; **Hamerton** (London, 3rd ed., 1881): 83–84.

550

For toners see above under 'Toners'.

551

Hopkinson 2002: 392; **Menpes 1** (1889): 330–331; *Naylor 1975*: xii–xiii.

552

Koehler (New York 1885): 225–226; *Koehler 1897*: xli.

553

Chattock (1880–1882), 3: 22; **Goulding** (Stirling 1910).

554

Ackley 1978. For the part on etching in Koehler's handbook he refers to Lalanne's treatise which he had translated some years before. Koehler reproduces illustrations after **Potémont 2** (Paris 1873) and he finishes the part on printing with a discussion on the use of plate tone and *retroussage*; **Koehler** (New York 1885); **Lalanne** (Boston 1880).

555

Koehler (New York 1885): 225.

556

Berthiaud (Paris 1837): 173; **Koehler** (New York 1885): 226.

557

Beraldi 1885–1892, V: 171–172.

558

Cohn 1995.

559

Aagaard (Kjøbenhavn 1894), does not refer to this discussion but his manual contains specimens of a cleanly wiped plate and a plate with heavy plate tone. **Chattock** (London, 3rd ed., 1886): 24, 61–65, p. 62, states that 'the great name of Rembrandt is adduced as an authority in support of the practice advocated'. **Goulding** (Stirling 1910): 122, 128, 149, remarks that no line can do without *retroussage*. **Herkomer** (London 1892): 63–65, Herkomer wipes the plate clean, followed by *retroussage* and condemns plate tone. The two specimens between pp. 58 and 59 show printing with and without *retroussage* respectively. **Meusnier** (Paris 1891): 133, is of the opinion that as little as possible should be left to the initiative of the printer. **Menpes 1** (1889): 330, is against the use of any whiting in wiping, and in favour of a light plate tone and *retroussage*. **Paton** (1893–1894) 3: 89, is in favour of *retroussage* and considers the use of whiting 'objectionable' although he uses it 'sparingly'.

560

Most authors describing *retroussage* take a more moderate point of view. **Barry** (New York 1929): 33, observes that 'very few plates will yield a pleasant print without tone or *retroussage*'. **Erremes** (Leuven 1942): 71, advises care to be taken. *Pennell 1936*: 287, regards *retroussage* as 'a wretched artless makeshift' and prefers plate tone. **Poortenaar** (Amsterdam 1930): 66–68, figs 9, 10, is positive about *retroussage* and illustrates the method. **Reed** (London 1914), views *retroussage* as 'one of the etcher's most valuable resources'. **Smith** (Alan; Ramsbury 2004): 119–120, gives technical details. **Strang** (David; London 1930), uses it in many instances, see the index. **Verbruggen** (Amsterdam 1981): 88–89, takes a more nuanced position and illustrates the technique.

561

Ebbinge Wubben 1956: [1]–[2]; *Derkzen van Angeren 1930*: [2]; *Rademaker 1978*: 7, 31–33; *Schotel & Rademaker 1967*: [1]. Proost and Schotel had owned a copy of the Dutch translation of Bosse's manual from 1928 but it was lost in the air raids on Rotterdam in 1940; **Bosse** (Amsterdam 1662).

562

Janssen (Rotterdam 1966): 53–54, with reference to the documentary film *De zwarte tampon* in which the machine is demonstrated; *Rademaker 1978*: 29; *Schotel & Rademaker 1967*: 3; *Tacken 1993*: 20.

563

Murray 1880; Rademaker 1978: 28.

564

'Undeliberate' means that no particular aesthetic arguments in favour or against are put forward.

565

Dohmen (Köln 1986): 273, 274; **Edmonson** (New York 1973): 43; **Fuchs** (Recklinghausen 1978): 65; **Kok 1** (De Bilt 1982): 32–33; **Leaf** (New York) 1976: 140; **Middleton** (London 1970): 63; **Saff** & **Sacilotto** (New York 1978): 159; **Schober** (Zürich, 3rd ed, 1986): 72; **Stijnman 2 (**De Bilt 1985): 27–28.

566

Chattock (1880–1882) 4 (1882): 10, 'tissue paper'; **Longhi** (Hildburghausen 1837) 2: 172, *Seidenpapier*; **Schwarz** (Nürnberg 1805): 94–95,

Seidenpapier; *Senefelder 1818*: 214, *Seidenpapier*; *Spelman 2003*: 10 no. 14, 'tissue'; *Waldow 1884, Seidenpapier*: 189. With the modern drying racks referred to above the fresh impressions are placed horizontally next to each other, after which the next layer of the rack is filled (see Fig. 264). This allows air to circulate on both sides.

567

The example comes from: Charles Louis de Fossé, *Idées d'un militaire pour la disposition des troupes*, Paris: Jombert, 1783. Nicholas Pickwood, email of 22 June 2005, refers to a copy in a private collection to which was attached, pasted to the front cover of a paper wrapper, the following note: *On est prié de ne point faire relier cet Exemplaire avant la fin de cette année, parcequ'il pourroit maculer sous le marteau du Relieur*. The explanation is as follows. The text of the book was sold in unbound quires, with additional plates available either as a plano sheet or in loose sheets. The typographic ink dries fast and does not offset, but the intaglio ink of the plates dries much slower, in the order of weeks. Before binding the quires are hammered flat, in which process the intaglio ink of the plates, if not yet completely dry, might offset onto the opposite page. To prevent this, the buyer was asked to wait some time before having the quires bound as a book. Offsetting may also occur while the books are subjected to pressure in a standing press during the binding process.

568

The use of such protective sheets may date back to the mid-eighteenth century. Nicholas Pickwood has seen English books from the mid-eighteenth century with thin sheets of paper covering the printed illustrations. The protective papers were perfectly thin and even occidental paper was used; personal communication with Nicholas Pickwood in June 2005.

569

Perkins 3 (1821): 51. German printed waterleaf papers were commonly sized by the bookbinder; *Haas 1984*: 153–155; *Prediger 1976*, 1: 2–5.

570

Fürstenberg 1963, discerns fifteen possible states of a typical eighteenth-century French engraving or etching, whether or not the plate was proofed. According to Hind, only available impressions can be counted as states; *Hind 1963-1*: 15–16.

571

Griffiths 1991-1.

572

New Hollstein Dutch & Flemish (Anthony van Dyck): nos. 1–15, 470.

573

The exception is the plate of Paul Pontius (NHD 8), but this was a problematic case. The etching was apparently made on a remainder of a copper plate, the plate was seriously damaged in the etching process, and it took some cutting of the plate edges and burnishing of the inside of the design to give it a marketable appearance.

574

See also below under 'Limited edition'.

575

He may have been inspired by the work of Ottavio Leoni. In their turn his 'empty' portrait etchings inspired nineteenth-century artist-etchers, especially Whistler; *Depauw & Luijten 1999*: 17, 23–25, 78–79; *Naylor 1975*, pl. 29 (K. 54, I), pl. 41 (K. 78, II).

576

Hinterding et al. 2000: 21. A similar case is seen with Le Blon offering for sale colour proofs of his portraits of Cardinal de Fleury and Anthony van Dyck in 1738; **Le Blon** (1738). See also below under 'Number of impressions per day' and 'Jacque Christoph Le Blon'.

577

See above under 'Plate tone'.

578

Deutsche Encyclopädie 1778–1804, 7: 676, only for small plates. **Delâtre** (Paris 1887): 33, *nous tournons soit un tour, soit deux*. **Dossie** (London, 2nd ed., 1764) 2: 205, not in the first edition, 'the contrary way … re-pass … This is always advantageous in works that are fine and of importance, because it secures the certainty of a better impression'. *Edlem von Keeß 1823*, 2: 42. *Krünitz 1792:* 239, only for small plates. *Voit 1786–1790*, 2: 102, improves the quality of the impression, *fällt schärfer und schwärzer aus*.

579

Jacques Besson, *Theatrum instrumentorum et machinarum*, Lyon: Vincent, 1582; Wolfenbüttel, Herzog August Library, 7 Geom. 2° (2). Jacques Besson, *Il Theatro de gl'instrumenti & machine*, Lyon: Vincent, 1582; Wolfenbüttel, Herzog August Library, 7.2 Geom. 2°. A number of prints in both volumes exhibit double lines due to running the plates through the press twice.

580

Peterdi 2 (New York 1959): 162.

581

Stijnman 2 (De Bilt 1985): 68.

582

The offsetting (*Abklatsch*) of drawings and paintings onto another surface is not under discussion here.

583

Berger 1973: 168; **Bosse** (Paris 1645): 73; **De Mayerne** (London 1620–1648): fol. 37r; **Filleau des Billettes** (Paris 1693–1698): 157; *Faidutti & Versini 1970*: 53. The technique of counterproofing is described more regularly in later centuries. For an improved variety see: **Linck** (1859).

584

Schoch et al. 2001: 21–22, fig. 6; *Seigneur 2004*: 115.

585

Seigneur 2004: 117, with examples in the following pages. **Dossie** (London 1758) 2: 206, the counterproof is used for correcting the design. Cornelis Galle I, working in Brussels, requested Paulus Moretus, working in Antwerp, to send him counterproofs of his engravings in order to be able to make corrections to his copper plates; information kindly supplied by Karen Bowen and Dirk Imhof.

586

Seigneur 2004: 123, 125.

587

Ibid., 121; *Van der Waals 1988*: 50. Instead of pasting two pieces together, the plate may also be printed on one half of a sheet, the sheet folded double with the impression on the inside and run through the press thereby offsetting the impression onto the other half of the sheet; *Rikken 2008*: 209 fig. 5.

588

Rijksmuseum, Amsterdam, Hinloopen Collection, Book No. 11: fol. 70–71. *Van der Waals 1988*: 50.

589

Brown & Landau 1981: 18. This is different from sketching on counterproofs to elaborate the composition.

590

See below under 'Printing *au repérage'*.

591

See Chapter 3, p. 158.

592

See below under 'Printing editions'. Both fresh and old prints can be counterproofed against any kind of hard surface, see above under 'Non-flexible surfaces'.

593

Maria Sibylla Merian, *Metamorphosis insectorum Surinamensium (etc.)*, Amsterdam: Valck, 1705.

594

The observation was made by Renate von Kries; personal correspondence in 2008–2009. She consulted seven copies of the first edition of 1705 and found four copies printed normally and three in counterproof; an eighth copy in a private collection could not be consulted, but probably contains a counterproof; *Von Kries 2007*: 86. Reitsma pays special attention to Merian's hand-colouring of counterproofs; *Reitsma 2008*: 165–167, 220, 223. The first time Merian used counterproofs was for her book on caterpillars: Maria Sybille Merian, *Der Raupen wunderbaren Verwandelung (etc.)*, Nürnberg, Frankfurt am Main: Merian, 1679–1683; cf. *Reitsma 2008*: 165. Interestingly, the 1726 edition of the *Metamorphosis* has normal and counterproof versions as well; two copies in the Herzog August Library, Wolfenbüttel, one with normally printed plates, the other with counterproofs; HAB, Na 2º 2 ('normal' impressions, uncoloured) and Na 2º 2a (coloured counterproofs throughout) were consulted. On the other hand, a 1705 copy in the British Library (BL 649.C.26) is a mixture of proofs and counterproofs, which raises questions such as: Did Merian supervise the compilation of the issues? How deliberate is the compilation of proofs and counterproofs? Is this copy a gathering of leftovers or are there more like this one?

595

Griffiths, referring to a copy of the 1719 edition with hand-coloured counterproofs, argues that in the case of the counterproofs of Merian's work the prints were thrown away because they were too dark, in favour of the lighter counterproofs in which the grey lines contrasted less with the colours; *Griffiths 2004-1*. In my opinion it is unlikely that a seventeenth-century plate printer would discard a perfectly good proof and Merian's financial situation was such that it is unlikely she could have afforded to have good impressions thrown away.

596

See Chapter 3, p. 160.

597

Counterproofs are found more often, but the question is whether Merian's books were the only ones of their kind in which both the print and the counterproof versions were published, or whether the technique was used more often with other publications. To what extent did others also publish volumes of counterproofs?

598

See above under 'Printing Medium'.

599

Paisey 1986; *Stijnman 2009-1*: 21, no. 6.

600

Raised uninked parts (blind embossments) were embedded as part of the image in Japanese *ukiyo-e* woodcut printing from about 1800 onwards, known as *karazuri*. Some nineteenth-century Western books were printed in large uninked type as a forerunner to Braille lettering to enable the blind to read the raised letters. *Thornton 1846*: 215–216, referring to: *The Holy Bible ... embossed for the use of the blind*, Glasgow: Alston, 1840.

601

See below under 'Cleaning of the plate'.

602

Gnan & Singer 2009: 215, 218, figs 146–149. This concerns a blind embossed impression of *The Judgement of Paris* (B. XIV, 197–198, 245, of c.1510–1520) by Marcantonio Raimondi.

603

Hercules Segers, HB 13 IIIp and HB 14 IIIp.

604

Lambert 1987: 122 fig. 113: 'According to eighteenth-century commentators the relief element was printed not from wood but from pewter plates with holes cut out to create the remarkable raised whites which are such a feature of his work.'

605

Only the arm of a second state of the *Portrait of Jan de Wael* by Anthony van Dyck was inked – the plate was overprinted onto an impression of an earlier state without the arm; *Depauw & Luijten 1999*: 165–166; *New Hollstein Dutch & Flemish* (Anthony van Dyck): nos. 15-II (copies with and without arm), 15-III (one copy without arm, two copies with arm).

606

Lehmann-Haupt 1966: 72, refers to the Master of the Playing Cards who practised this. Examples can be seen in the Italian and Latin editions (both Lyon 1582) of Jacques Besson's book on architecture, as well as the German edition (Mümbelgart 1595), in which the upper parts of all the plates were covered with a strip of paper before printing and Letterpress text is printed in the blank spaces; this is recognisable because

the plate tone stops abruptly and in a straight line; *Besson 1578*. Further examples: Wolfenbüttel, Herzog August Library, Graph. A2: 46, Jacques de Fornazeris, *Almanach, povr l'an mil six cens seize*, Lyon 1615, first the engraving was printed with the middle part left blank by covering it with a sheet of paper, typographic text was added in the second printing. Wolfenbüttel, Herzog August Library, Graph. A2: 52, Leonard Gaultier, *Ornamental Border with Blank Inner Space*, the engraving was printed with the middle part left blank by covering it with a sheet of paper, Paris: Nicolas de Mathonieri, first quarter of the seventeenth century. In both cases the embossment of the paper placed on the printing plate is clearly present. The middle would not have been engraved, keeping some plate tone, though, but the sheet kept this part perfectly clean in printing.

607

There is reference to making a proof of a printing plate by pressing some semi-liquid lead into the grooves: *Chomel 1743*, 2: 799. Compare this with a lead relief by Jasper Johns; *Field 1978*: 67 fig. 129.

608

Adam & **Robertson** (London 2007): 198–199; **Edmonson** (New York 1973): 125; **Elexpuru** (Bilbao 1995): 123–124; **Etstechnieken** (Madrid 1992): 39–44; **Fuchs** (Recklinghausen 1978): 47–48; **Huebsch** (2003); **Kok 1** (De Bilt 1982): 64; **Lehtinen** (Helsinki 1992): 90–91; **Maxwell** (Englewood Cliffs, N.J., 2nd ed., 1977): 361; **Ramos Guadix 2** (Granada 1999): 78–81; **Ross & Romano** (New York 1972): 59–60; **Saff & Sacilotto** (New York 1978): 164–165; **Schober** (Göttingen 1974): 76, 99; **Smith** (Paul; Sydney 1983): 18; **Stijnman 2 (**De Bilt 1985): 63; **Verbruggen** (Amsterdam 1981): 165–168; *Viesulas 1979*; **Welden** & **Muir** (New York 2001): 56–57.

609

Several terms exist for the same process. Most expressions are French and have been adopted in other languages: *chine collé*, India proof, *japon collé*, *japon appliqué*, *papier collé*.

610

Originally Chinese paper was used, later Japanese; **Chattock** (1882) 4: 2. By the end of the nineteenth century and in the early twentieth century a mock India paper, ie a European paper made to look like oriental paper, was used; *Jenkins 1990*: 50–51, 53.

611

Smith (Paul; Sydney 1983): 24.

612

Berthiaud (Paris 1837): 142–143.

613

Maxwell (Englewood Cliffs, 1977): 357–360; **Saff & Sacilotto** (New York 1978): 166.

614

Buonaccorsi (Ravensburg 1916): 129–130; **Saff & Sacilotto** (New York 1978): 166; **Shure** (San Francisco 2000): 57–59. For an early description of this technique used for lithography see: *Brégaut 1827*: 50–52.

615

Goulding (Stirling 1910): 99–101; **Neale** (Springfield 1927): 62–63.

616

A paper conservator confronted with a *chine collé* print with the thinner paper detaching from its backing paper will have a difficult job putting it back in position again unnoticed. The bubbles will not shrink back again, the sizing used in the restoration may be of a colour different from the original sizing, and lines continuing from the thinner paper onto the thicker paper will no longer fit. It is therefore not uncommon that the *chine* is taken from the original backing, mounted onto a new sheet and impressed with a blank plate to emboss a new platemark; *Jenkins 1990*: 54. The difference is that in this mounting and embossing any original surface texture is flattened. The image is also limited to the *chine* paper, while in the original it is not uncommon to find some lines of the image extending beyond its edges onto the thicker European paper.

617

In addition, a yellowish tint was first printed to copy the *chine*, upon which the engraving (or lithograph) was printed. It would have been cheaper and a similar effect could have been achieved, but it was not appreciated by everyone at the time; *Druk-inkt 1866*: 126.

618

Hunter 1978: 495. Oriental paper found its way to Europe on several earlier occasions, see above under 'Oriental paper'. By the mid-eighteenth century oriental paper was imported on a more regular basis. Cochin suggested using Chinese paper for printing the engravings ordered by the Chinese emperor in France in 1767, which would have been imported by the French East India Company, but his idea was not acted upon; *Revue 1905*: 103.

619

Griffiths 2001; *Krill 1987*: 77–79 fig. 71, the Chinese paper is larger than the plate, falls outside of the plate edges and therefore cannot be called *chine collé* in the strict sense. The technique is occasionally referred to as *chine monté*; **Adeline** (Paris 1894): 293.

620

Krill 1987: 79 fig. 72.

621

Berthiaud (Paris 1837): 141–143; **Roller** (Wien 1888): 100.

622

Dyson 1989: 8; **Goulding** (Stirling 1910): 79; **Neale** (Springfield 1927): 62–63.

623

Chattock (London, 3rd ed., 1886): 57–59.

624

Brunsdon (London 1965): 64; **Hülsmann** (Wiesbaden 1991): 42–43; **Lehtinen** (Helsinki 1992): 133–134; **Maxwell** (Englewood Cliffs 1977): 357–360; **Peterdi** (New York, rev. ed., 1980): 324–325, 327; **Ross & Romano** (New York 1972): 123; **Saff & Sacilotto** (New York 1978): 165–166.

625

Jenkins 1990: 53–54.

626

Ikeda et al. 2002: 044–046.
627
Courses in *chine collé* printing have been available in western Europe since the second half of the 1990s. Brian Shure published his manual on *chine collé* printing in 2000, relying on techniques he had learned in China and Japan; **Shure** (San Francisco 2000): 19–27, 48–49. Japanese printmakers giving courses in southern Asia disseminated the technique there.
628
Adam & Robertson (2007): 199–200; **Catafal & Oliva** (Barcelona 2002): 112–113; **Hartill** (London 2005): 27–28; **Rogers** (2000); **Smith** (Alan; Ramsbury 2004): 139–140; **Stobart** (London 2001): 66–67; **Welden** & **Muir** (New York 2001): 126; **Whale** & **Barfield** (London 2001): 76.
629
For an example using veneer see: **Shure** (San Francisco 2000): 103.
630
Bosse (Paris 1645): 71; **Dossie** (London 1758) 2: 201.
631
Berthiaud (Paris 1837): 250–251 (*Mitaines, Cartes ou Poucettes*), pl. 2 nrs. 25; **Longhi** (Hildburghausen 1837) 2: 172.
632
Smith (Allan; Ramsbury 2004): 120–123, the series of photographs shows the handling of the paper fingers. See also: **Kätelhöhn** (Möhnesee, 3rd ed., 1998): 68. The printer prepares a number of pinchers in advance – they become soiled very quickly and have to be replaced regularly. Instead of paper, thin brass plate can be used giving stronger, long-lasting pinchers that can be cleaned again. The modern printer uses disposable surgical gloves to keep his hands clean during wiping or alternatively, if he wipes with bare hands, plastic gloves for handling the paper.
633
Bury 2001: 173; *Von Heusinger 2001*: 93–94, n. 83; *Woodward 1991*.
634
Von Bartsch 1821, I: 10,
635
Voit 1786–1790, 2: 101.
636
Shure (San Francisco 2000): 81–88.
637
Berthiaud (Paris 1837): 298–304, describes four kinds of *presses à satiner*; **Dossie** (London 1758) 2: 202.
638
Chattock (1880–1882) 4 (1882): 10; **Cutner** (London 1947): 94; **Longhi** (Hildburghausen 1837) 2: 172; **Schwarz** (Nürnberg 1805): 95; *Von Bartsch 1821*, I: 10; *Waldow 1884*: 189. Blotters are still in use.
639
Cutner (London 1947): 75, 93–94; **Steel** (London 1938): 44.
640
Von Bartsch 1821, 1: 10.
641
Bosse (Paris 1645): 64; **Cellini** (Fiorenza 1568): fol. 43v; **Dossie** (London 1758) 2: 165–167, 202–203; **Gessner** (Leipzig 1740–1745) 3 (1741): 443 (*Eintrocknen*); *Halle 1761–1779*, 1 (1761): 225; **Keller** (Stuttgart 1815): 22; **Longhi** (Hildburghausen) 2: 60; **Manuel de curiosidades** (Madrid 1854): 11–12; **Schall** (Leipzig 1863): 33, 37; **Schwarz** (Nürnberg 1805): 95; *Voit 1786–1790*, 2: 98.
642
Bosse (Paris 1645): 36–37. Stains on the copper plate may also be removed by polishing with a mixture of olive oil and charcoal powder; **Roller** (Wien 1888): 103.
643
Bosse (Paris 1645): 46.
644
Kosch-Görlitz (Wien 1932): 46. In earlier centuries the oil would probably have been removed by rolling breadcrumbs over the plate.
645
Bosse (Paris 1645): 64; **Bosse** (Paris 1745): 148.
646
Hercules Segers, *Mountain Valley with Fenced Fields*, 1620s, etching, London, British Museum, Dept. of Prints and Drawings, reg. no: S.5534; *Haverkamp-Begemann 1973*, 6 1b; *Rowlands 1979*: 34 no. 53
647
Marcantonio Raimondi, *Young Woman Watering a Plant*, 1507–1508 (?), engraving, Delaborde 179, II / Bartsch XIV. 292.383; New York, The Metropolitan Museum of Art, Drawings and Prints, Box Raimondi 161–189. Giulio Campagnola, *Ganymede on the Eagle*, Braunschweig, Herzog Anton Ulrich-Museum, inv. GCampagnola V 3.871.
648
Berthiaud (Paris 1837): 205–210; **Bishop** (Philadelphia 1879): 17 n.; **Bosse** (Paris 1645): 73; **Gessner** (Leipzig 1741–1745) 3: 453 (*Potasche*); *Printing 1994*: 24, the original text is from 1819. The Amsterdam plate printshop of Johan Blaeu contained 'a large copper lye kettle, and a dito ash tray' and 'a lye tray lined with lead to put the plates in'; the lye was drawn from the ashes by boiling in water; *Proeve 1695*: fol. D2r.
649
Von Bartsch 1797: 232.
650
Barth (Hildburghausen 1837) 2: 60; **Berthiaud** (Paris 1837): 208–209; **Bishop** (Philadelphia 1879): 6, 17, first turpentine followed by degreasing with chloroform; **Delâtre** (Paris 1887): 31; **Hamerton** (1866): 295; **Hamerton** (London 1871): 7, 38, cleaning with turpentine,

whiting and breadcrumbs; **Herkomer** (London 1892): 46, cleaning 'on the heater' with 'methylated spirits' to remove the shellac and next with turpentine to dissolve the ground; *Hunt 1880*: 7; **Ligeron** (Paris 1923): 150, alcohol is also used if the resin proves difficult to dissolve; **Mai** (Dresden 1924): 22; *Printing 1994*: 24; *Seemann 1894*: 50; **Ziegler** (Halle, 2nd ed., 1912): 253.

651
Forbes 1964: 2–3, 24, 26–27, 35–36, 43–44; *Humphrey et al. 1998*: 43–44, 192–193. Naphtha proved useful in warfare when the Byzantines developed distillation methods and used the so-called 'Greek fire' from the 7th century onwards. *Forbes 1964*: 3, 13, 41–42, 106–109. For a detailed study on Greek fire, see: *Roland 1992*. Production of the solid bitumen continued in the Middle East, with trade throughout the Islamic world, but liquid bitumen was rarely used; *Forbes 1964*: 33–34, 39–40, 42.

652
Agricola 1950: 581–582.

653
Bartl 2005: 352–353 no. 1184.

654
Forbes 1964: 1.

655
Ibid.

656
Statistiek 1861.

657
Essence 1861; *Handelsnamen 1870*. Volatile hydrocarbons such as benzine, chloroform or ether were used in the preparation of liquid etching grounds; see Chapter 3, p. 196.

658
Hamerton (London 1871): 38; *Hunt 1880*: 7; **Ligeron** (Paris 1923): 150. **Lalanne** (Paris 1866): 42 uses the expression *essencez la planche*, which Koehler (**Lalanne** (Boston 1880): 28) translates as 'Clean the plate with spirits of turpentine'; Koehler (p. 64) also recommends cleaning with 'benzine'. **Roller** (Wien 1888): 102: *Essenz*.

659
See Chapter 3, p. 198.

660
Herkomer (London 1892): 46–47.

661
Chronic or prolonged exposure to volatile organic solvents causes brain and nerve problems, known generically as organic psycho syndrome (OPS, also known as 'painters' disease). OPS is common in the printing trade and other industries that use volatile organic solvents.

662
When working with such solvents they evaporate, the vapour is inhaled and drawn into the lungs where it is absorbed by the blood and transported to the brain in approximately 20 seconds. The larger part of the brain is comprised of fat – as turpenoids dissolve fat, the fatty parts of the nerves are dissolved and the function of the brain impaired.

663
Adam & Robertson (London 2007): 214–216.

664
Folkertsma & Stijnman (1995); **Folkertsma, Sincovitz & Stijnman** (1996). Non-volatile solvents, known generically as vegetable cleaning agents (VCAs), are suitable for both removing wax-based etching ground and oil-based printing ink. The ester emulsifies wax-based ground or oil-based ink, after which the mixture can be washed off with water and detergent. Cleaning with oils and esters allowed printmakers to continue working with 'classic' etching grounds and printing inks. The choice of cleaner did not affect the appearance of prints.

665
Hoskins 2004: 88; **Howard** (Rochester 2003): 76. See above under 'Emulsifiers'.

666
Woodcroft 1969: 488–489, English patent, A.D. 1855, May 21.–No. 1139, see also pp. 493–494, English patent, A.D. 1855, June 23.–No. 1445; **Silbermann** (1856): 85.

667
Georg Schmidtke, *Patentschrift Nr 700556*, 23 December 1940.

668
The oldest, fifteenth-century impressions were pulled from a plate without using a press, see: Chapter 1, p. 37. Rubbings of engraved objects and copper engravings from the sixteenth century and later turn up now and again. The British Museum, Department of Prints and Drawings keeps rubbings from etchings on silver by Herbert Cantelupe de Henzell (1570–1600); reg. nos. 1912,0822.11–16. The Zilvermuseum in Schoonhoven (The Netherlands) keeps an eighteenth-century collection of rubbings of engraved silver clasps for bags. The printroom of the Koninklijke Bibliotheek/Bibliothèque Royale in Brussels has a collection of rubbings from the studio of a silversmith from the mid-sixteenth century; *Van der Stock 2002*: 19. The Victoria and Albert Museum in London has a set of four rubbings from the interiors of silver standing dishes (*tazze*), probably engraved by Johann Theodor de Bry in the early seventeenth century, taken while the engraving was in progress; *Hayward 1953*. The oldest known instructions for printing an intaglio plate by rubbing are contained in an early sixteenth-century manuscript; **Marciana manuscript** (Gaeta 1570): fol. 157v–158r. For modern instructions see: **Aagaard** (Kjøbenhavn 1894): 75; *Augustin 1768*: 403–404; **Banner** (London, 3rd ed., 1935): 74, 77; **Borch** (1635): fol. C1r; **Erremes** (Leuven 1942): 72; **Hübener** (Leipzig 1916): 180–181; **Kosch-Görlitz** (Wien 1932): 65–66; **Lairesse** (Amsterdam 1707): 377; **Marsh** (London 1975): 111; **Pattemore** (Worcester 1966): 63; **Roller** (Wien 1888): 90–92; **Rothe 2** (Wien 1929): 26–27; **Seibold** (Eßlingen, 3rd ed., 1916): 52–57; **Thorstensen** (Oslo 1946): 125–126, after Seibold; **Ziegler** (Halle, 2nd ed., 1912): 260–261. Instead of inking the crevices it is also possible to roll up the surface of the plate, cover it with a sheet of paper and print the plate in relief by means of rubbing; **Middleton** (London 1970): 50. The aim of the impression is, of course, a negative of the intaglio print.

669

Hübener (Leipzig 1916): 180, recommends adding some oil varnish or soap in case the ink is too thick. According to **Roller** (Wien 1888): 91, printing ink usually is too viscous and not short enough, because of which he recommends thinning the ink with some oil varnish. Instead of using an oil-based ink, Van Laer gives a prescription for a mixture of two parts of rancid butter with one part of soap and as much lampblack as possible, while Chomel describes a mixure of of wax, turpentine and lampblack; *Chomel 1743*, 2: 799; **Laer** (Amsterdam 1721): 211.

670

Ziegler (Halle, 2nd ed., 1912): 260–261.

671

Stijnman (De Bilt 1985): 68.

672

Lalanne (Paris 1866): 81. Since then the technique has appeared in manuals on intaglio printmaking: **Buckland-Wright** (London 1953): 168; **Donjean** (Paris 1889): 45–46, not in the modern editions; **Hamerton** (1866): 296; **Rhead** (London 1890): 48–49; **Thorstensen** (Oslo 1946): 124–125.

673

Hamerton (London 1871): 71. For the press, see above under 'The metal roller press, 1800–2000'.

674

Semenoff 2010-1, *2010-2*; **Welden** & **Muir** (New York 2001): 37. A variety using casters was developed by Charles Morgan; *Morgan 2004*.

675

For nineteenth-century techniques to reproduce the plate itself see Chapter 3, p. 226. For offsetting impressions onto inflexible surfaces see above under 'Other supports'.

676

Cf. *Spamer 1930*: 112, n. 3.

677

Method (1828): 208.

678

Bishop (Philadelphia 1879): 16; **Hamerton** (1866): 295; **Lalanne** (Boston 1880): 55, 68; **Longhi** (Hildburghausen 1837) 2: 175; *Waldow 1884*: 354 (*Gips- und Schwefel-Abdrücke*, after Longhi).

679

Compare this with the so-called *Eßzettel*, also known as *Eßbilder* or *Schluckbilder*. These are devotional prints on paper that are eaten by humans and fed to animals to fight diseases and ward off evil spells; *Klein 1937*, col. 685; *Massing 1992*; *Richter 1973*; *Stiefel 1969*: 152, 154.

680

See Chapter 1, p. 40. The actual date of production of the sulphur casts cannot be established.

681

Vasari 1568, 2: 294.

682

Chomel 1743, 2: 799, both sulphur and lead are used here. These materials are poured on paper and while still soft the plate is laid on top of the lead or sulphur. The reverse is struck with the flat of the hand; **Hübener** (Leipzig 1916): 180; **Longhi** (Hildburghausen 1837) 2: 176–177; **Roller** (Wien 1888): 94.

683

The melting temperature of sulphur, between 113 and 119°C is not high enough to burn the oil-based printing ink.

684

The hot sulphur may also react with the steel, leaving stains of iron disulphide (FeS_2). Instead of sulphur Ziegler recommends collodium: the printing plate is covered with collodium, absorbent paper is stuck to it and the whole is lifted after drying; **Ziegler** (Halle 1901): 260. Roller states that casting sulphur is unpleasant, the cast does not look good and it is limited to casting from copper plates because taking plaster casts from steel plates makes the steel prone to rust quickly, as confirmed by Barth; **Longhi** (Hildburghausen 1837) 2: 176–177; **Roller** (Wien 1888): 94.

685

Plaster casts of woodcuts are also possible; **Ross** & **Romano** (New York 1972): 71–73; **Peterdi** (New York 1959): 166.

686

With thanks to KRO Television for broadcasting my demonstration of the technique in May 1985. I would also like to express my appreciation to curator Els Tholen for hosting a small exhibition of my plaster casts and the casting technique in the Printroom of Leiden University in August 1985.

687

Peterdi 2 (New York 1959): 165.

688

Huygens-2 (Den Haag 1650).

689

Ibid., fol. 231r: *van gelycke moecht ghy oock ander colueren met olie temperen*.

690

The following references contain prescriptions for casting printing plates in plaster up to the early twentieth century; references containing only general information are not mentioned here. **Aagaard** (Kjøbenhavn 1894): 76–77; **Bishop** (Philadelphia 1879): 16–17; **Böttger 2** (1855): 29; **Bosse** (Nürnberg 1795–1796) 2: 300; **Cröker** (Jena 1736): 394–395; *Dictionarium polygraphicum 1735*, unpaged, under 'IMPRESSION'; **Fokke 2** (Leyden 1804): 77, translation of *Dictionarium polygraphicum*; **Hamerton** (1866): 295–296; **Hübener** (Leipzig 1916): 181; **Lalanne** (Boston 1880): 68–69; **Liebhaber 1** (Nürnberg 1696) 2: 540, 576; **Liebhaber 2** (Nürnberg 1703): 339–340; **Longhi** (Hildburghausen 1837) 2: 175–176; **Lumsden** (London 1925): 19, referring to Koehler's translation of Lalanne; **Method** (1828); **Profit** (Paris

1913): 70; **Rhead** (London 1890): 49; **Roller** (Wien 1888): 92–94; **Thorstensen** (Oslo 1946): 123–124; **Ziegler** (Halle, 2nd ed., 1912): 259–260.

691

Baden 1797: 150; *Martens 1976*: 62–63, 85 nos. 88–89.

692

Hayter (London 1949): 147; **Peterdi 2** (New York 1959): 164–165.

693

The original French version only has a description of taking rubbings on waxed paper, to which Koehler added a note on taking a cast in plaster; **Lalanne** (Boston 1880): 68–69.

694

Hayter (London 1949): 146–153.

695

The following references contain modern prescriptions for casting printing plates in plaster: **Adam** & **Robertson** (London 2007): 220–221; **Brunsdon** (London 1965): 40: **Buckland-Wright** (London 1953): 168–169; **Chamberlain** (London 1972): 179–180; **Edmonson** (New York 1973): 79; **Middleton** (London 1970): 49–50; **Petterson** & **Gale** (London 2003): 42–44; **Sévy** (London 1975): 90; **Stijnman 2 (**De Bilt 1985): 64; **Trevelyan** (London 1963): 92–93.

696

Because production was concentrated in Germany these objects are commonly defined using German terms: *Flandrische Bilder*, *Hausenblasenarbeit*, *Hausenblasenbilder*, *Klosterbilder*. The term *Flandrische Bilder* might perhaps refer to a Flemish origin.

697

Liebhaber 1 (Nürnberg 1696) 2: 573, 575, 577; *Pictorius 1747*: 273; *Schatz-Kammer 1697*: 190; *Tiemann 1806*: 25–26.

698

Spamer 1930: 112–125, 323–324, Taf. CLXXVII; *Willers 1986*: 120–124.

699

Spamer 1930: 125.

700

Chomel 1743, 2: 799: for printing engravings without a press use a mixture of wax, turpentine and lampblack. Instead of casting a plate in wax it is also possible to print on paper or textile coated with wax, if the wax is warm and soft; **Dull** (2003).

701

McCormick 2001: 30.

702

Edmonson (New York 1973): 79.

703

Ibid.

704

Gentenaar 1987; **Ross & Romano** (New York 1972): 145–147.

705

Nash 2008: 128–141, notes on pp. 301–303.

706

See also Chapter 1, p. 43.

707

Bowen & Imhof 2005: 261.

708

Zonca (Padoua 1607): 78.

709

Goulding (Stirling 1910): 69. A mezzotint may print as many as 1,000 copies if steelfaced again after every 200 impressions.

710

See Chapter 1, p. 52.

711

Filleau des Billettes (Paris 1693–1698): 146, 159. Fielding considered that an aquatint plate he had seen in Paris made on a 'double hammered' copper plate could print up to 2,000 good impressions; **Fielding** (London 1841): 43.

712

Perrot (Paris 1865): 28.

713

Bowen 2003: 3. An engraver from the School of Fontainebleau supposedly printed an edition of 2,000 from his plate; *Landau & Parshall 1994*: 31.

714

Van der Stock 1998: 396–397.

715

Berthiaud (Paris 1837): 281; *Courboin 1914*: 119; *Portalis & Beraldi 1880–1882*, 1: 202–203, 'Boissieu', *mille belles eppreuves*, the darker areas can be traced with drypoint or burin (p. 203); *Spaans 1997*: 11; *Thijs 1983–1985*: 590; *Voit 1786–1790*, 2: 101–103; *Weigel 1698*: 215. Papillon discusses the large differences between numbers that may be pulled from copper plates or woodblocks. A woodcut, he says, easily pulls 20–30 times more impressions than a copper plate without noticeable wear, and in particular cases editions may run into millions; *Papillon 1766*, 1: 420–429.

716

Henrici (Leipzig 1834): 31; **Perrot** (Paris 1830): 31, 144.

717

Deutsche Encyclopädie 1778–1804, 7: 676; *Halle 1761*, 1: 227; *Voit 1786–1790*, 2 (1790): 101–103, after Halle.

718

Henrici (Leipzig 1834): 31.

719

Perrot (Paris 1865): 28.

720

Edlem von Keeß 1823, 2: 31, 34–37; **Hassel** (1811): 99; **Hassel** (London 1811): 6; **Henrici** (Leipzig 1834): 31; **Keller** (Stuttgart 1815); *Michel 1996*: 129; **Morrow** (New York 1935): 58.

721

Henrici (Leipzig 1834): 31; **Joubert** (1858): 18; **Querfurt** (Wien 1792): 107–108, 111.

722

Ludwig von Siegen, *Letter to Wilhelm VI Landgraf of Hessen-Kassel accompanying a small number of portraits of his mother Amelia Elisabetha Landgräfin of Hessen-Kassel*, Amsterdam 19/29 August 1642; *Laborde 1839*: 44–45 (transcription), 69–71 (French translation and facsimile).

723

Chelsum 1786: 4–5, n. 4, gives '100' before reworking. *Edlem von Keeß 1823*, 2: 33, after the first 150 copies the plate is reworked; it is reworked again after every 50 impressions up to 300. *Krünitz 1792*, 23: 240, gives '300'. **Schall** (Leipzig 1863): 44, gives '500'.

724

Querfurt (Wien 1792): 115, 133.

725

Bentley 2007: 717.

726

Hammann 1857: 249, edition of '10,000' of a glass plate in France in 1800; **Molard** (1811), **Perkins 4** (French ed. of 1822): 130, edition of '40,000' of a hardened steel plate in France in 1810.

727

Berthiaud (Paris 1837): 283; **Goulding** (Sterling 1910): 22; **Partington** (London c.1825): 127; **Perkins 4** (1821): 49, 51; **Perkins 4** (French ed. of 1822): 119.

728

Berthiaud (Paris 1837): 281; **Partington** (London c.1825): 127; **Warren** (1823): 92. Nevertheless, although Berthiaud states that the number of impressions printed from a steel plate could be six times higher than from a copper plate, he also warns that much depends on the quality of the steel, which may already become worn after only a few hundred impressions; **Berthiaud** (Paris 1837): 174–175.

729

Harris 1968–1970, 4: 72–73.

730

For steelfacing see Chapter 3, p. 137.

731

Denison (London 1895?): 127, gives an edition of '1,500' for a steelfaced photogravure.

732

Lupton (1823): 42, gives '1,500'.

733

Paton (1893–1894) 3: 14, gives '1,000'.

734

Gaiffe (1878).

735

Neale (Springfield, Mass., 1927): 65.

736

Welden & **Muir** (New York 2001): 127.

737

Fokke (Dordrecht 1796): 264–265.

738

See also Chapter 3, p. 119.

739

Bowen & Imhof 2001: 264 gives '412 + 234'; p. 268: '525' and '375 + 750'; p. 270: '520'; pp. 284–285: '520'. *Imhof et al. 1992*: 147–149, gives '450'. *Voet 1969–1972*, 2: 203, 220–221, 226 give '600 + 450', 2: 230 n. 3 gives '800' or '600', 2: 232 n. 2 concerning Raphelengius in Leiden gives '300'.

740

Voet 1975: 386.

741

Bowen & Imhof 2001: 263. Another example, on p. 268, is of a missal printed in an edition of 1,500, of which 1,000 were illustrated with woodcuts and 500 with engravings.

742

Bredius 1911: 186, gives '2,500' in Amsterdam in 1710. *Cruz de Carlos 2003*: 348, gives '2,200' in Madrid in 1621. *Hotz 1911*: 12, gives '1,000' in Amsterdam in 1711. *Larson 1987*: 24, gives '1,000' in Philadelphia in 1790. *Spaans 1997*: 11, gives more than '1,500' published in Delft in 1698. *Voet 1969–1972*, 2: 220–221, gives '4,000' in Antwerp in 1754.

743

Bowen & Imhof 2001: 268, title plate for a missal in an edition of 1,500 ('for all of the copies printed, including those with woodcut illustrations') published in Antwerp in 1598 and another title plate for a missal in an edition of 1,300 published in Antwerp in 1599.

744
Tempesti (Firenze 1994): 166.

745
Deutsche Encyclopädie, 7: 676; *Edlem von Keeß 1823*, 2: 41; *Halle 1761*, 1: 227; *Voit 1786–1790*, 2: 101–103.

746
Fifty impressions can be pulled from a highly finished portrait on steel per day, and a 7 × 10 in. plate produces 180–200 per day, the working day lasting fourteen hours; *Hunnisett 1980*: 190. In Antwerp in 1850, 400 copies a day were printed of a small portrait with a view; *Lemmens & Thijs 1994*: 205.

747
Krünitz 1792, the young man turning the press is called *Lehr-Burschen* (apprentice) in the plate accompanying p. 240, which is a copy after the headpiece to the chapter on printing in *Halle 1761* (p. 223), which in its turn is a copy of Bosse's plate of 1643 (see Fig. 68, p. 80).

748
Berthiaud (Paris 1837): 275–277.

749
Ebrall charged 8d per 100 impressions or 15s for three days of work. With 1s = 12d, a total of 180d for 2,250 impressions in three days gives 750 impressions per day; *Gaskell 2004*: 221, referring to D.F. McKenzie, *The Cambridge University Press 1696–1712*, Cambridge: CUP, 1966. It has already been mentioned above how Perkins's method of copying the design of one stamp in more plates allowed the production of 240,000 stamps or more per day. Furthermore see below under 'Enlarging the edition'.

750
Antonio Campi in Cremona contracted Nicolò and Giacomo Valegio in Venice for the engraving of a *Passion of Christ* in 1574, and required from them 200 impressions, 100 printed on paper and 100 on textile; *Bury 2001*: 48, 72. In 1640 Thomas Cunningham ordered 200 copies of a political allegory to be printed on textile and 1,800 on paper; *Lennox-Boyd 1990*. The Roman plate printer Pietro Paolo Giuliani printed 200 impressions of a plate with papal imagery on paper and another 12 on textile in 1666–1667; *Golzio 1939*: 354. Abbot Gregor Stremer ordered 600 copies of a thesis to be printed on paper and two more on 'yellow atlas' in 1716; *Hochenegg 1963*: 37. Engraver John Le Keux placed an order with the plate printer McQueen's in 1830 for editions of his plates to be printed partly on oriental paper and partly on French paper; *Bain 1966*: 15. On the occasion of the death and burial of the first Belgian queen, Louise Marie of Orléans on 11 October 1850, Antwerp schoolchildren were all given a commemoration in the form of a print, 4,000 of which were printed on parchment and 6,000 on paper, while another 62 copies were printed on large paper; *Lemmens & Thijs 1994*: 205. See above under 'Printing Support'.

751
Duverger 1984: 26, shows how much was still in stock.

752
Cooney 1996: 36–37.

753
For cleaning see above under 'Cleaning of the plate'.

754
Bosse 1649: 85–86.

755
See above under 'Frankfurt black'.

756
Bosse 1649: 85; *Griffiths 1990-4*: 446; *Lehrs 1973*, 1: 56.

757
Bowen & Imhof 2001: 276–279, give '600' with another '600' after reworking and '600 + 100' with another '646' after reworking. *Bowen & Imhof 2005* cite the exceptional number of '18,257' for a title plate, which may have been reached by using a number of plates with exact copies of the original design. Cf. **Rueda** (Palma de Mallorca 1990): [13]–[14] of the introduction gives '15,000' for a coat of arms without re-engraving, which could be possible if the design was very straightforward and cut extra deep or alternatively using several copies of the original design. *Hunnisett 1998*: 121, gives '5,000' with re-engraving. **Zonca** (Padoua 1607): 78, gives '1,000' and '2,000' with reworking.

758
Francis (1842) 3: 277–278; **Thorstensen** (Oslo 1946): 138–141, the ground used is stiffer than is usual.

759
Henrici (Leipzig 1834): 31.

760
Mortimer (1731): 103, gives '3,000' for a reworked mezzotint.

761
Other cases concern series of mezzotints bound with an extra title page in letterpress, for example: *Renversement de la morale chretienne par les desordres du Monachisme. Première partie = Omstootinge der christelyke zeden. Door de wan-schik en ongeregeltheden der Monniken. 't Eerste deel*, without an *impressum* but probably published in Holland c.1680 because of its (fictitious) patent (*Privilege/Privilegie*) by Pope Innocent XI, pope from 1676 to 1689.

762
For transfer methods see Chapter 3, p. 154.

763
Thijs 1983–1985: 578–579. Such sodalities developed everywhere the Jesuits were active; *Verheggen 2006*: 183.

764
Cruz de Carlos 2003: 347–348.

765
For example, if the plate had the design engraved 4 times and the plate was printed 2,000 times, a common maximum for a well-engraved copper plate, then the total edition would be 4 × 2,000 = 8,000 impressions.

766

Antwerpen, Ruusbroecgenootschap keeps two copper plates with the same design of a St. Genoveva. One plate is engraved by Cornelis Galle and the other, more coarser plate by Cornelis van Merlen; Ruusbroecgenootschap, Antwerp, pl. Kp. 79 and Kp. 102. It also has four prints engraved with a decorated text of the Lord's Prayer. All the prints have an identical design, but show small differences mutually and each is signed by a different engraver.

767
Courboin 1914: 120. Courboin writes *cinquante mille*, but it could be that he made a mistake and the original text reads *cinque mille*, in which case we arrive at the more acceptable number of 1,250 impressions per plate; compare with the following note.

768
Courboin 1914: 120. Courboin writes that the portraits had to go with *les quatre cent millions d'assignats*, but it seems more likely that the original text reads *quatre cent mille*. In which case, from a total edition of 400,000, an edition of 2,000 impressions per plate were printed. These are acceptable numbers per plate and for the total. Otherwise 2,000,000 impressions per plate would have to be pulled, which is absurd.

769
Perrot (Ilmenau 1831): 114.

770
Van Huffel 1926: 114. No contemporary source known.

771
Perkins 2 (1820): 163–165; **Perkins 4** (1821): 48. For further details see Chapter 3, p. 226. Perkins calculates that the production of 150,000,000 impressions in 20 years from his replicated plates works out considerably less expensive than using copper plates; **Perkins 4** (1821): 48–50.

772
Antreasian & Adams 1971: 228, 231, 252; *Hunnisett 1980*: 192–193.

773
Hunnisett 1980: 195, 197.

774
Joubert (1858): 18; **Process** (1858).

775
Goulding (Stirling 1910): 69; Harris 1968–1970, *Hunnisett 1980*: 191.

776
See Chapter 3, p. 228.

777
Lalanne (Paris 1866): pl. 1, 2.

778
Lalanne (Paris 1878): pl. 1, 2. Perhaps Amand Durand's process was used because Klíč's process was not yet available.

779
Cicogna 1969–1983, 4: 335, *mille copie*.

780
Cruz de Carlos 2003: 348.

781
Hazewinkel 1936.

782
Bredius 1911: 186.

783
New Hollstein Dutch & Flemish (Anthony van Dyck): nos. 1–15, 470.

784
See above under 'States'.

785
Depauw & Luijten 1999: 24. For a discussion of the *non-finito* in prints from the sixteenth to the early twentieth century and its reception, see: *Parshall 2001*.

786
Houbraken 1718–1721, 1: 271.

787
Bain 1966: 15.

788
Melot 2005–2006: 9–10, 13–15; *Naylor 1975*: xi, about the Fine Arts Society which published a limited edition of 100 of Whistler's first Venice set in 1880.

789
Melot 2005–2006: 10.

790
Beaumont's Constable 1993; *Cahen 1994*; *Clayton 1992*; *Griffiths 1993, 1994-2*; *Landau 1992*; **Roller** (Wien 1888): 96.

791
Roller (Wien 1888): 96.

792
Laventhol 1989.

793
Dickens 1911: [14].

794

Chamberlain (London 1972): 181; **Hayter** (New York 1981): 125.
795
Welden & **Muir** (New York 2001): 10.
796
The following paragraph is a reworked version of *Stijnman 2001-3*: 14–15.
797
See also Chapter 1, p. 43.
798
These print series should not be confused with numbers of prints ordered according to a theme or a few themes gathered together by a print dealer or collector. Such compilations are produced by various designers, engravers and publishers, the printing plates are of different sizes, are made with various techniques, are printed on various kinds of paper, and they commonly have their margins trimmed because of the limited space available; *Griffiths 2003*: 10, 13, 15; *Luijten 2000*: 1; *McDonald 1998*: 23–24, 27–35.
799
Grand Scale 2008: 100; *Landau & Parshall 1994*: 86–87, fig. 76. The first composite woodcut prints were simple designs used as wallpaper and are therefore seen as cheaper substitutes for tapestries and wall paintings; *Appuhn & Von Heusinger 1976*: 7–10. Landau & Parshall view these large prints 'as competitors of paintings'; *Landau & Parshall 1994*: 83.
800
Von Heusinger 2001. Because the figures at the right side of the last plate are cut off and as the people are moving to the right at least one more plate seems to be missing.
801
The *Entry of Emperor Charles V and Pope Clement VII in Bologna on 24 February 1530*, Nicolaas Hogenberg, 1530–1539, etching; Wolfenbüttel, Herzog August Library, Graph. A 3: 41.01. The first complete reproduction of the Trajan Column, designed by Girolamo Muziano and etched by Leonardo Sermei (Rome 1576), was perhaps originally sold as a roll; *Bury 2001*: 65.
802
Girolamo Maziano inv. Leonardo Sermei sc., *Columna Traiani imperatoris*, Roma: Breggi, 1576; copy in the Wolfenbüttel, Herzog August Library, Xd-FM.4.
803
New Hollstein Series Dutch & Flemish (Anthony van Dyck): no. 535; *Van der Waals 2006*: 102–103. Some assembled wall maps are bigger.
804
Griffiths 2003: 11–12. The Herzog August Library keeps at least fifteen of such objects, while many bound and loose prints kept in the collections show that they were originally stitched together like this.
805
Griffiths 2003: 12. See also above under 'Paper formats'.
806
The system was introduced in the British Museum around 1860 and has been adopted by most print collections; *Griffiths 2003*: 9.
807
Ibid.,12–13.
808
Bruin et al. 1990: 173–174; *Griffiths 2003*: 12.
809
Griffiths 2003.
810
McDonald 1998: 34, Album I-43: 'all prints are bound on their own paper', means that the impressions were not cut from their margins but the full sheets were bound in the album. For a study of bound print series by Crispijn de Passe see: *Veldman 2001-1*: 149–166.
811
My research was largely carried out in the Herzog August Library, Wolfenbüttel. Its collections keep a few hundred volumes with bound and pasted-in print series. Many other such volumes can be found in older libraries but they may be difficult to discern because there is no special entry for volumes with print series. Some of the oldest printrooms in existence keep bound volumes of print series next to their collections of mounted prints.
812
Usually one plate is printed in the middle of one half of the sheet. In some cases two plates are printed next to or above one another in the middle of one half of the sheet.
813
The second method was already being practised in the fifteenth century; *Weekes 2004*: 82, figs 88, 89. See also Chapter 1, p. 43.
814
See below under 'Jigsaw-plate printing' and 'Printing *au repérage*'.
815
Pagani 2008-2: 373. For example: Wolfenbüttel, Herzog August Library, Graph. A1: 771 & Graph. A1: 772.
816
See also below under 'Combination techniques'.
817
The Herzog August Library holds a few dozen examples of sixteenth-century bound print series in which all the sheets of the series are folded and bound together in one quire. Some are still in their original covers, ie just as they were traded.
818
Theatrum oder Schaubuch, Allerley Werckzeug und Rüstungen des Jacobi Bessoni [Jacques Besson] ... nun leztlich auß der Latinischen unnd Frantzösischen Sprach in die Hochteutsche Sprach verdolmetschet, Mümbelgart: Jacob Foillet, 1595; Wolfenbüttel, Herzog August Library, Od 2º 3. The volume shows five prickings on the left-hand side of the probably original stitched binding.

819

Typical is the first ever conference on early colour prints: *Impressions of Colour: Rediscovering Colour in Early Modern Printmaking, ca 1400–1700*, Cambridge (UK), 8–9 December 2011. A volume covering the theme of the conference extended with eighteenth-century developments is in preparation.

820

See Chapter 1, p. 45.

821

Griffiths 1991-2; for a reaction see: *Stijnman 1992-2*. Several of Hercules Segers's etchings are printed with white (now yellowed) ink on coloured paper. HB 46a is printed with white ink on dark brown prepared paper and varnished. HB 48 is printed with white ink on brown prepared paper. HB 49 is printed with white (?) ink on paper prepared with a black ground and varnished.

822

For a list of fifteenth-century engravings printed in colour see Chapter 1, p. 69, n. 180.

823

The forthcoming volume *Printmaking Masters of Fontainebleau* by Catherine Jenkins on the prints by artists of the School of Fontainebleau will discuss this phenomenon of colour printing in more detail.

824

The Herzog August Library in Wolfenbüttel keeps an uncatalogued bundle of eighteenth-century engravings copied after designs in the *Tekenboek* (Amsterdam 1740) by Frederick Bloemaert that are typically printed in red; see also below under '*Chiaroscuro* woodcut and intaglio'.

825

Albrecht Dürer, (late?) impression in red, 1519, of *St. Anthony* (B. 58); *Levenson*: 422, 426; *Meder 1932*: 56. Lucas van Leyden, *Christ, Paul and the Twelve Apostles*, *New Hollstein Dutch & Flemish* (Lucas van Leyden): 13 nos. 86–99, late sixteenth-century impressions in red, probably by the Antwerp plate printer Martinus Petri. *Le char de l'amour ou le vaisseau d'artifice*, Jacques Callot, etching, printed posthumously (?) in red, Paris, Bibliothèque national; *Rodari 1996*: 28. A number of Rembrandt etchings were printed posthumously in red; *Hinterding 2008*, 1: 185. The Museum Boymans-Van Beuningen in Rotterdam keeps a seventeenth-century volume of bound print series with engravings by the Wierix family, also containing one miscellaneous gathering of engravings by Hieronymus Wierix taken from different series and printed in red.

826

The *Chalcographische Gesellschaft* in Dessau (fl. 1796–1805) offered a number of their publications either in black or monochrome in colour, the colour impressions being more expensive; *Michels 1996*: 269–283 nos. 2, 4, 5, 14–16, 20, 22, 23, 28–32, 40, 43, 44, 47, 48, 50–52, 57, 59, 63, 64, 146.

827

Mezzotint plates printed monochrome or *à la poupée* appeared from around 1700. Any dating of such impressions has to be viewed with some caution because actual printing dates are not known; *Rodari 1996*: 49 fig. 45.

828

Schwarz (Nürnberg 1805): 90.

829

Stijnman 2005-2; *Teeuwisse 2007*: 50–53. The watermark of the paper is a bow and arrow, comparable to Briquet 815 ff, northern Italy, 1515–1540. For pigment analyses see above under 'Colorants'.

830

This idea was also suggested by Ger Luijten. Further varnishing would make it look even more like a painting, but over time the varnish would also be detrimental for the print. Also, if anything similar has survived it has probably been classified as a painting.

831

Windelinum Dieterlin, *Architectura. De quinque columnarum Simmetrica distributione et variis eorundem ornamentis. Liber I & II*, Argentina (Strasbourg): haeredes Bernhardi Iobini, 1593 and 1594 (= 1595). The work is discussed below, see under 'Jigsaw-plate printing'.

832

Zonca (Leipzick, 1st ed., 1607–1610), pt. 1 (1607), title page; copy in Wolfenbüttel, Herzog August Library, 31 Geom. (1). Zeising = **Zonca** (Leipzick, 2nd ed., 1612–1614), pt. 4 (1613), title page; copy in Wolfenbüttel, Herzog August Library, 32 Geom. (2). The etched title plate for part 3 of the second edition has the text cut out and replaced by typographic text printed in red and black, while the surrounding etching is printed in black; copy in Wolfenbüttel, Herzog August Library, 32 Geom. (1). The etched title pages of volumes 2 and 5 are printed in black only. Although the title pages are dated, the bibliography of Zeising's work is complicated and it might well be these parts were printed at a later date; **Zonca** (Leipzigk 1607–1610), etc.

833

Segers's HB 22 Ib is perhaps printed *à la poupée*. The print displays a light green colour changing to light brown to the left and to the right. However, the changing of the colour could be due to browning of the oil varnish or discoloration of the pigment. The current ongoing Segers project will examine this for the forthcoming exhibition in the Rijksmuseum, Amsterdam, and Metropolitan Museum of Art, New York, in 2016. For the provenance and function of Segers's prints see: *Van der Waals 1988*: 135–157.

834

Rikken 2008: 217. My oeuvre catalogue of Teyler and immediate followers will appear in the New Hollstein Series Dutch & Flemish in 2014.

835

The application was for 25 years; *Lemmens & Van Beers 1961*: 12, after Obreen; *Obreen 1877–1890*, 7: 154–155; *Van Eeghen 1974*: 122, with corrected text of the patent.

836

Van der Waals refers to the print auction catalogue of Theodoor van Beresteyn, 18 April 1695 in which, according to him, products from Teyler's workshop were offered; *Van der Waals 1988*: 137, 159. This is unlikely, because Teyler produced decorated textile, while the volumes of prints on paper were probably used as sample books. Three of those volumes are still in existence, in the National Gallery in Washington, DC, the British Museum in London and the Rijksmuseum in Amsterdam; a fourth volume was kept in the Kupferstichkabinett

in Berlin but disappeared in 1945. For lists of prints in these volumes see: *Haemmerle 1937*: 47–56; *Thieme-Becker*, 32, 'Teyler, Johannes': 573–574. More prints are found in small groups or loose copies spread over a number of collections; *Boerner 1999*: 10–42. Many of them have traces of binding, which means that they once were kept in albums that were taken apart.

837

Lemmens & Van Beers 1961: 17; *Van Eeghen 1974*: 122.

838

Schipper-van Lottum 1995: no. 1572 (25 February 1698, 8 May 1698), no. 1628 (10 May 1698). The place where the auction was held seems to indicate that his workshop was located in that town, although he apparently lived in Amsterdam in 1690 and had his workshop in Rijswijk around 1695; *Schipper-van Lottum 1995*: no. 504 (7 December 1690). Teyler seems to have been dead by 1709, but little to nothing is known about him after his trip to Berlin in 1697 and the 1698 auctions. See my forthcoming Teyler volume.

839

Van Call and Berkenboom were also acquainted with each other, as Berkenboom was witness to the baptism of a daughter of Van Call on 9 October 1692 in Rijswijk; *Lemmens & Van Beers 1961*: 15–16, 25–26.

840

Lemmens & Van Beers 1961: 15; *Obreen 1877–1890*, 7: 148.

841

The following series are all printed *à la poupee* in five colours on average. Laurens Scherm, Johannes Leupenius, Pieter [Petrus] Schenck, Jan Veenhuysen, *Tooneel der voornaamste nederlandse huizen en lusthoven, naar 't leven afgebeeld in 55.* [= handwritten]*, kopere plaaten = Representation des principales maisons, & des iardins de plaisance du Pais-Bas, désinées au naturel, dans '55.'* [= handwritten] *planches de cuivres*, Amsterdam: Allard [1694–1697]; the bound series kept in the Library of the University of Amsterdam with an incomplete bound set kept in the Fondation Custodia, Collection Lugt, Paris; *Rikken 2008. Veus et perspectives de Loo, Honslarsdyck et Soesdyck, chasteaux & maisons de plaisance du Roy de la Grande Bretagne, Ausquels on a adjûté les veuës des environs de Cleves (etc.)*, Amsterdam: Valck, 1695, three series of 16 prints, bound together with a fourth series of 16 prints: *Vues et perspectives de la ville de Cleves et de sa cour, comme aussi des contrées circumjacentes (etc.)*, Amsterdam: Valk, 1695; Den Haag, Koninklijke Bibiotheek. The first series with different title page (*Veues et perspectives de Soesdyck (etc.)*, Amsterdam: Valk, 1695) is also kept in the Rijksmuseum, Amsterdam, as loose prints catalogued under 'Johannes Teyler'. Jan van Call inv., Petrus Schenck fec. *Admirandorum quadruplex spectaculum, delectum, pictum, et aeri in cisum*, Amsterdam: Schenck, (c.1700). There is a copy printed in black as well as one printed *à la poupée* in colours; Den Haag, Koninklijke Bibiotheek. *Villae regiae Risvicanae, pace inter Germanos, Gallos, Anglos, Batavus, coeterosque foederatos ... conspectus elegantes … 20 septemb. 1697 facta (etc.)*, Amstelaedami: Schenck, (c.1697), kept as loose prints in the Rijksmuseum, Amsterdam, which also keeps the series printed in black and bound in a volume. *'t Lust-hof van zyn britannische Majesteit Willem de Derde op 't Loo (etc.) = Representations au naturel De Loo maison de plaisance de sa majesté Britannique Guillaume III (etc.)*, Amsterdam: Allard, (c.1698) its 24 plates, bound together with three other series of 16 plates in black only, is kept in the Newberry Library, Chicago.

842

Cornelis de Bruin, *Reizen door de vermaardste deelen van Klein Asia (etc.)*, Delft: Krooneveld, 1698; *Obreen 1877–1890*, 7: 159. Translations in French and English; *Voyage au Levant*, Delft: Kroonevelt, 1700; *A Voyage to the Levant*, London: Tonson (etc.), 1702.

843

The French-language copy is still complete and has been held by the Library of the University of Amsterdam since 1997. The Dutch-language copy has been taken apart and some of the colour prints can be found in public collections, such as the large view of Constantinople (a folding plate at the beginning of the book) in the possession of the Scheepvaartmuseum in Amsterdam and a page with two views of the Bosphorus in the Harvard Art Museums. The English translation has plates in black only.

844

Von Uffenbach 1753–1754, 3: 674–677.

845

Mortier 1992: 12–15; *Van der Waals 2006*: 37 cat. 27.

846

Boerner 1999: 43–44 cat. 63–65; *Haemmerle 1937*: 60–70; *Landwehr 1976*: 7–8; *Rikken 2008*; *Rodari 1996*: 32 no. 23; *Van Eeghen 1974*.

847

An etching by Georg Strobl (1644–1717) commemorating the Austrian emperor, Leopold I (reigned from 1658 to 1705) is printed *à la poupee* on parchment; *Holle 2003*: 32–33. One of the first French mezzotints printed *à la poupée* was a portrait of Alexandre Boudan *Imprimeur de Roy*, perhaps produced shortly after 1702; *Rodari*: 49 fig. 45. The English mezzotinter Elisha Kirkall seems independently to have discovered *à la poupée* printing in about 1707; *Levis 1912*: 178.

848

Bosse (Paris 1745): 128.

849

Montdorge 1 (1749): 176. In his article, Montdorge quoted from the 1738 report he had compiled for the Académie des Sciences on Le Blon's method of printing.

850

Laurie (1784). Laurie's text was also copied in the **Compendium of colors** (London 1797): 201–202.

851

Dickens 1911: [12] – [14]; *Dyson 1984*: 155–158, Dyson noted that this technique was still in use in the printshops of Thomas Ross in London and Leblanc in Paris in 1979; *Frankau 1900*: 62–63.

852

Dickens 1911: [14]; *Dyson 1984*: 157.

853

Audebert & Vieillot 1802; see the introduction in vol. 1 for technical information. Only the figures in the first plate have gold applied by hand-colouring; see vol. 1: 1. Audebert credited the success of this magnificent undertaking to the work of the engraver Louis Bouquet and especially to the plate printer Langlois for solving the technical difficulties; see vol. 1: 1–2.

854

The pigments of the print were analysed using X-ray diffraction (XRD) and the metal was found to be gold (Au); *Hallebeek et al. 1994*. All the copper plates were acquired by William Maclure and donated to the Academy of Natural Sciences in Philadelphia, PA, together with the copper plates of Audebert's *Oiseaux de l'Amérique Septentrionale* in 1835. Thirty years later the proprietors of the Academy decided to sell the plates as 'refuse copper'; *Cassin 1865*. Eleven copper plates have survived and they show the birds' names etched in the plates; with many thanks to Carol M. Spawn, then librarian of the Academy, for supplying information on the plates and their provenance in 1993. For the use of gold as a pigment in ink see above under 'Metal pigments'.

855

Short (London 1888): 28.

856

The animal 'colours' were cut from the plates of the Master of the Playing Cards and recycled in different combinations; see Chapter 1, p. 25. Combining several blocks to make one image or decoration was common for the printing of metalcuts and woodcuts from the 1450s onwards, see for example: *Stijnman 2009*: 24–30, nos. 9–15. Combining several relief printing plates to print one image was suggested to prevent counterfeiting by Solomon Henry in the later eighteenth century and again by William Congreve in the earlier nineteenth century; *Burch 1983*: 121–124; *Harris 1968–1970*, 4: 56–66; *Woodcroft 1969*: 96–97, 147–148, 153–154, English patents, A.D. 1786, December 9.– No. 1575 (one), A.D. 1819, November 1.–No. 4404 (six) and A.D. 1820, December 22.–No. 4521. Printing two or more intaglio plates next to each other in one run was described by Cochin: **Bosse** (Paris 1745): 150.

857

See above under 'Printing series'.

858

For the terminology see: **Peterdi** (New York 1959): 212.

859

Lucas van Leyden, B. 57-65. The bordure plate wore quickly and was replaced by an exact copy, probably engraved by Lucas himself while the *Passion* plates were still in good condition; *Filedt Kok 1978*: 62–63, 65, 80–82, 118–119; *New Hollstein Dutch & Flemish* (Lucas van Leyden): 154 nos. 57–65. Circular plates with decorative borders are found in earlier decades, such as the so-called Otto prints (see Fig. 45, p. 44). Ilja Veldman suggests that Lucas may have derived the idea of (separate) borders in engravings from painted glass roundels with decorative borders, cf. *Husband 1995*: figs on titlep. and on pp. 37, 66, 76 and 86.

860

Horae Beatissimae Virginis Mariae, Antwerp: Plantin, 1570. *Humanae salutis monumenta*, Antwerp: Plantin, 1571, with later editions in 1575 and 1581, the earlier publications were offered with and without borders, the last without borders only; *Bowen 2003*. *Parable of the Unmerciful Servant*, Van Doetecum brothers (?) after Hans Vredeman de Vries, c.1570–1575. Strapwork-etched cartouches with engraved captions, a rectangle cut out of each of the four copper plates and separate engraved images inserted. In the second edition the cartouches are of a lighter hue than the inserted plates due to wear; *Hollstein Dutch & Flemish*, 47–48, Vredeman de Vries: nos. 331–334.

861

Dominicus Custos, *Fuggerorum et Fuggerarum quae in familia natae quaeve in familiam transierunt quot extant aere expressae imagines*, Augsburg: Custos (?), 1593. Theodor de Bry, *Emblemata nobilitati et Vvlgo scitu digna …, Stam und Wapenbuchlein* (Köln?): Theodor de Bry, 1593. *Divesarum[!] gentium armatura equestris*, Cologne: De Bruyn, 1577; *Jong & Groot 1988*: 80–81. The method can also be used to replace a part of the original plate with a new part, eg to replace earlier text that has been cut off: Abraham de Bruyn, *Omnium poene gentium imagines (etc.)*, 2nd ed., Cologne: Rutz, 1577, pl. 37. *Jong & Groot 1988*: 32-33, 48–51.

862

Nicolas de Nicolay (Nicolas Nicolai), *Der Erst Theyl Von der Schiffart vnd Rayß in die Türckey vnnd gegen Orientt*, Nürnberg: Gerlatz, 1572. The plate was etched by Conrad Saldörffer. See: *Hollstein German*, 37, Conrad Saldörffer: 183–185 no. 26, with no reference to multiple-plate or colour printing.

863

Windelinum Dieterlin, *Architectura. De quinque columnarum Simmetrica distributione et variis eorundem ornamentis. Liber I & II*, Argentina (Strasbourg): haeredes Bernhardi Iobini, 1593 & 1594 (= 1595). Both volumes have decoratively etched title plates out of both of which two smaller parts with text are cut. Both larger plates are inked in black; the upper smaller plate of volume 1 is inked in black and that of the title plate of volume 2 in red. The lower smaller plates of both are inked *à la poupée* in black and red, inserted in the larger plates and the whole printed in one run. The same system of jigsaw-plate printing was used for the extended 1598 edition, which has five parts with five title plates. Part three has a new title plate, but again with loose text plates, part four has the title plate of part two and part five has the title plate of part three. All have separately inserted smaller text plates, but not every copy is printed in colour; Wendel Dietterlin, *Architectura, von Außtheilung, Symmetria und Proportion der Fünff Seulen, und aller darauß volgender Kunst Arbeit, von Fenstern, Caminen, Thürgerichten, Portalen, Bronnen u. Epitaphien*, Nürnberg: Balthasar Caymox, 1598. Some copies have the small text plates printed in red, while others are printed in black only; *Jong & Groot 1988*: 160–169. See also the 1655 edition with the same title plates. For a facsimile in black only see: *Placzek 1968*. Another (undated) example of jigsaw-plate printing using three plates by Wendel Dietterlin and depicting *Stories from the Life of Abraham* are held by Karlsruhe, Staatliche Kunsthalle, printroom, inv. no. 1965–42 and London, British Museum, Dept. of Prints and Drawings, reg. no. 1973,0414.11; *Andresen 1864–1878*, 2: 250–251 no. 9 (centre plate, printed in black), 252 no. 11 (lower plate, printed in brown), 252 no. 12 (upper plate, printed in brown), all references with no mention of colour printing.

864

Georg Philipp Harsdörffer, *Peristromata Turcica, sive dissertatio emblematica, prsaesentem Europae statum ingeniosis coloribus repraesentas*, Lutetia Parisiorum (= Nürnberg): Toussaint du Bray (= Wolfgang Endter the Elder), 1641. The same plate of the carpet is used for all seven prints and there are seven different inserts; *Burch 1983*: 47; *Duportal 1914*: 86. The carpet can be red and the insert black, or vice versa, while different copies of the volume may have different colour combinations of the same plates. The insert of the title plate is sometimes printed in dark blue instead of black; Herzog August Library, Wolfenbüttel, Ge 311 (4).

865

John Pine, *The Tapestry Hangings of the House of Lords (etc.)*, London: J. Pine, 1739.

866

D'Arcy Hughes & Vernon-Morris (Mies 2008): 160–161; **Peterdi** (New York 1959): 214.

867

Historical examples of this form of multiple-plate printing can be found in: Mangen Seutter, *Ein schönes und nuetzliches Bissbuech (etc.)*, 2nd ed., Augsburg: Dabertzhofer, 1614. *Biblia Ectypa*, Augsburg: Weigel, 1695. Giorgio Vasari, *Vite de piu eccelenti pittori, scultori ed archittetti*, Firenze: Stecchi, 1772. Printing is in black only in all cases.

868

Stijnman 2 (De Bilt 1985): 94–97, summarises 18 different registration techniques.

869

For an overview of the early history of colour printing see: *Burch 1983*: 1–12.

870

Johannes de Sacrobosco, *Sphaera mundi (etc.)*, Venice: Ratdolt, 1485.

871

The frontispiece of: *Incipit obsequiale collectum ex diversis (etc.)*, Augsburg: Ratdolt, 1487; *Grimm et al. 2011*: 62–63, no. 16; *Stijnman 2009-1*: 27, no. 12. Yellow, red and brown colour fields are printed over the black key plate.

872

For recent discussions see: *Bialler 1992*; *Hinterding 2005*; *Kemmer 2004*; *Landau & Parshall 1994*: 179–202.

873

See below under 'Combination techniques'.

874

Zonca (Leipzig 1613), pt. 4, title page.

875

Typical examples are: Dirck Volckertsz. Coornhert, *Two Victories of Emperor Charles V*, Antwerp 1555, two engravings printed in black on blue paper, highlights with brush or pen in white watercolour; *Bialler 1992*: 173–175. Jost Amman sc., Wenzel Jamnitzer inv., *Perspectiva corporum regularium (etc.)*, Nürnberg: (Jamnitzer?), 1568, four etchings printed in black on blue paper, highlights with brush or pen in white watercolour; Wolfenbüttel, Herzog August Library, Ua 4° 10, A.I-IIII.

876

Van der Waals 1988: 138–139. HB 25 Ia is printed in black ink on white paper. Segers printed more of his etchings with white ink on coloured paper (HB 46a, HB 48, HB 49), but no other prints printed *au repérage* by him are known.

877

Bosse (Paris 1645): 74–75.

878

This method is not likely to have been used in practice because the plate will always curve upwards when there is a blanket underneath. Instead of a blanket a sheet of voluminous paper may be used.

879

See Chapter 3, p. 154.

880

Reed 1993; *Rodari 1996*: 43.

881

St. Paul, c.1650–1725, etching, printed in black from one plate and in white from two more plates on brown paper; *Griffiths 1991-2*: 287, 289.

882

St. Roch Praying during Pestilence, Johannes Glauber (Polidoro) after Gerard de Lairesse, c.1720, etching, printed in black and white from two plates; *Hollstein German*, 10, Johannes Glauber: 104 no. 68; *Stijnman 1993*.

883

Aanwinsten 2002: 83–84 no. 11; *Van der Waals 2006*: 29, cat. 10–11.

884

Lettres patentes qui permettent aux sieurs Abraham Bosse graveur en taille douce, et Charles delafont[aine] d'jmprimer sur toutes estoffes de soje, papier, velin parchemin, cuir, etc., Paris, 6 Janvier 1637; Paris, Bibliothèque National, Ms. Fr. 21.732: fol. 138r–141v; another copy (not seen) is held by the Archives Nationales, Paris, shelfmark: Autres series, 06.01.1637.XIa 8653: fol. 83–(?). No information seems available on an engraver called Charles de La Fontaine, unless he is the same person as the weaver Charles de Lafontaine, who was active in Brussels around 1640–1650; *Thieme-Becker*, 22, 'Lafontaine, Charles de': 208.

885

Bosse (Paris 1645): 72–73.

886

Hyatt Mayor 1980, text accompanying figs 347–349. The same method is described in all later editions of Bosse's manual and copied by others, but apparently no one practised it; **Filleau des Billettes** (Paris 1693–1698): 159–161.

887

Stijnman 1991-2: 157–159.

888

By the seventeenth century colour theory had accepted that mixtures of red, yellow and blue pigments as well as a combination of red, yellow and blue light produced the same intermediate colours. This was wrong, however. The reflection of light on a coloured surface is now called 'subtractive' because only the lightwaves that are reflected reach our eyes and determine the colour(s) we observe – the remainder are subtracted and do not reach us. The direct projection of light is called 'additive' because the different lightwaves reaching our eyes together add up to the combined colour observed. *Shapiro 1984*: 110, 506–507.

889

For the different spellings of Le Blon's name see: **Le Blon** (Stuttgart 1985): 11–12. I chose the spelling 'Jacque Christoph Le Blon'.

890

Le Blon's presence is officially documented in Amsterdam from 1705 onwards when his name was entered in the list of citizens (*poorterboek*), meaning that he had already been living in Amsterdam for a few years; **Le Blon** (Stuttgart 1985): 19, 22–23, 85; *Singer 1901, 1903*; *Stijnman 1997-2*.
891

Franklin & Franklin 1977: 41–42, p. XI; *Gascoigne 1997*: 10–17, pl. 4–5; *Grimm et al. 2011*: 78–81, nos. 24–25; **Le Blon** (Amsterdam 1916): 14–22, afb. 1–16; *Rodari 1996*: 70–71, 78–90, 111–132; *Singer 1917–1918*.
892

Bosse (Paris 1745): 125.
893

Le Blon (Stuttgart 1985): 20; **Le Blon** (Leiden 2006), 2: 35–39. The gentlemen did know Newton's work, but although Ten Kate had a copy of the book they are not discussing a colour theory. They are trying to formulate a general theory for the shading of human skin and discuss a general system for human proportions at the same time. Nevertheless, they do mention that (white) light is a mixture or red, yellow and blue light rays; **Le Blon** (Leiden 2006), 1: 162, letter of 3 February 1710: fol. 1r, l. 41.
894

Le Blon was first mentioned in the postscript to the letter by Van Limborch to Ten Kate dated 13 December 1706. The text suggests that he was working on colours without further details; **Le Blon** (Leiden 2006), 1: 23 n. 3. In his letter of 3 January 1711 to Van Limborch (fol. 2v, l. 24–25) Le Blon writes about 'his invention' (*mijne vinding*), referring to his invention of printing in colours; **Le Blon** (Leiden 2006), 1: 184 and 2: 149. In his letter of 1 January 1712 (fol. 1r, l. 10–11) Ten Kate writes that Le Blon is absorbed by his printing; **Le Blon** (Leiden 2006), 1: 203.
895

The brothers Uffenbach visited Le Blon on 11 February 1711 in the afternoon; **Le Blon** (Stuttgart 1985): 22–23; **Le Blon** (Leiden 2006), 2: 147–148; *Von Uffenbach 1753–1754*, 3: 534–535.
896

Le Blon (London 1725): 6–7; **Le Blon** (Stuttgart 1985): 114, 188–189.
897

The first to state this was Gautier-Dagoty. He quoted Le Blon correctly, but perhaps he simply misunderstood Le Blon's mention of Newton's name and did not quite follow the differences between working with coloured light and colour paint; **Gautier-Dagoty 1** (July 1749): 160–161, 166–167. Mortimer and Cochin had already correctly understood the difference between Le Blon's colour printing and Newton's scientific research; **Bosse** (Paris 1745): 126; **Le Blon** (Stuttgart 1985): 120–121; **Mortimer** (1731): 101.
898

Thompson pays attention to the tradition of division by seven; *Cennini 1960*: 20-21, n.1. See also the term 'seven' in Wikipedia.
899

Newton 1979: 154–158. There is also a subtle difference in terminology. Newton speaks of 'primary' colours, and Le Blon of 'primitive' or 'original' colours; **Le Blon** (London 1725): 6.
900

Lang 1984: 229; **Le Blon** (Stuttgart 1985): 100. Young also made clear that this separation in three primary colours is due to the anatomy of the human eye. He did not know about the involvement of the brain in the actual observation of colour.
901

Le Blon (Paris 1756): 114–124. For proofing the blue plate he used indigo because Prussian blue gave too much plate tone, which made it difficult to detect mistakes in the proofs. For proofing the red plate he used vermilion. Some natural (not artificial) vermilion could be mixed with the carmine.
902

The order of the plates was black, blue, yellow and red, with perhaps one or two plates more, the colours of which Robert does not give; **Robert 2** (1749): 153. Compare this with a remark by Gautier-Dagoty, who, correcting a line in his letter of July 1749, talks about *cinquiéme & méme sixiéme couleurs primitives*, by which he means the use of five or six plates; **Gautier-Dagoty 3** (1749, Oct.): 102 n.
903

Le Blon 1721; **Le Blon** (Stuttgart 1985): 32, 139.
904

Gautier-Dagoty 2 (July 1749), the adjoining plate shows pinholes in the four (?) corners (only upper right and lower right are visible). Instead of pinholes in the four corners, they are also found in the middle of each side of plates with four-colour prints from later in the eighteenth century. The first description of this system of needles and pinholes is by Enfield, who relates that the needles are attached to the first plate, which probably means he did not really understand the system; **Enfield** (London, 2nd ed., 1822): 318–319. *Model & Springer 1912*: 21–22. With the change of wooden presses to metal presses and the introduction of metal press beds, needles could no longer be hammered into the bed. Instead needles were pierced through the prints from the back through the embossments of the holes in the plate after the first impression. The needles were fitted into the holes of the second plate, the paper was moved into position and the needles were removed before printing the second colour. The same working order was used for all later impressions.
905

The same order in: **Gautier-Dagoty 4** (1756, Jan.): 200; **Gautier-Dagoty 3** (Oct. 1749): 109. The author of an article on Le Blon's work in the *Journal de Trévoux* (August 1737): 1442, gave the same order of printing the colours, quoted in: **Gautier-Dagoty 3** (Oct. 1749): 113–114; *Rodari 1996*: 145. Sets of colour separations of the *Portrait of Cardinal de Fleury* and of the *Self-portrait of Anthony van Dyck* were offered for sale by Le Blon; *Mercure de France* (August 1738). For reproductions of the *De Fleury* colour separations see: *Grasselli 2003*: 43, figs 1–4; **Le Blon** (Stuttgart 1985): pl. 53–56; *Rodari 1996*: 74–75, figs 54–57. For reproductions of the Van Dyck colour separations see: *Franklin & Franklin 1977*: 39–40, pl. X. For reproductions of the colour separations for the *Dura Matris (inside)* by Jan Ladmiral of 1738 see: *Gascoigne 1997*: pl. 4. For reconstructions of the colour separations for a plate of a human heart by Jan Ladmiral see: **Le Blon** (Amsterdam 1916): 14–22, afb. 1–16. For reproductions of the colour separations for the *Village Wedding* by Charles-Melchior Descourtis of 1785 see: *Grasselli 2003*: 109. These all show separations in the three primary colours according to Le Blon's system.
906

Jean Robert developed a simplified version of Le Blon's method. He printed a first plate in black, a second in red and if necessary added a third plate for blue; **Le Blon** (Paris 1756): 128–130.

907

Le Blon had already added a fourth plate while still working in London, as reported by Cromwell Mortimer, secretary of the Royal Society: 'Sometimes more than the three Plates may be employ'd; viz. when Beauty, Cheapness, and Expedition require it'; **Le Blon** (Stuttgart 1985): 53, 122; **Mortimer** (1731): 103. This does not necessarily refer to a black plate as Le Blon also used an extra blue or a white plate for several prints. Le Blon received a privilege for printing with 'three' plates on 12 November 1737, with letters patent in 1739 and their confirmation in 1741; *Privilege*, given to Jacque Christoph Le Blon on 12 November 1737 in Fontainebleau, Paris, Archives Nationales, cote E 2159: fol. 158r–158v and Lettres Patentes on 24 July 1739, Paris, Archives Nationales, cote 7 G X I A 8745, fol. 6–8; **Le Blon** (Stuttgart 1985): 64–65, 143–144, reproduction fig. 16 on p. 63. Gautier-Dagoty wrote about a second committee visiting Le Blon in 1739 after he had received his letters patent, but this is not mentioned by Lilien unless the 1741 committee for the confirmation of the letters patent is meant; **Gautier-Dagoty 3** (Oct. 1749): 117–119; **Le Blon** (Stuttgart 1985): 144. The committee, according to Gautier-Dagoty, was not very pleased with Le Blon's work. Perhaps it was formed to reinvestigate Le Blon's application because the privilege mentions printing paintings with 'three' plates (*imprimer les Tableaux avec 'trois' planches*), whereas Le Blon was using four or five plates. Nevertheless, the following letters patent and their confirmation secured Le Blon's privilege. A further possibility might be that during the six weeks Gautier-Dagoty had worked under Le Blon he may have seen the use of an extra blue plate and later considered the use of a black plate instead. However, his claiming of Le Blon's privilege that Le Blon's 4-year-old daughter had inherited after her father's death in 1741 does not show him in a favourable light.

908

Robert 1 (Jean; 1748), this is an announcement by Robert for a new print by him in Le Blon's manner, published in November 1748. Robert is said here to have a royal privilege (for this print only) and to have been a pupil of Le Blon; concerning French royal privileges see: http://en.wikipedia.org/wiki/Printing_patent. **Gautier-Dagoty 1** (Dec. 1748), this is the article, published in December 1748, in which Gautier-Dagoty announced new colour prints by him and made the claims that started the polemic, and in which he stated that Robert did not have a royal privilege (for Le Blon's process), was not a pupil of Le Blon (Robert joined Le Blon after Gautier-Dagoty had left) and that Robert had learned printing with four plates by studying prints by Gautier-Dagoty (Robert continued working on Le Blon's plates after his master's death). **Gautier-Dagoty 2** (July 1749); **Gautier-Dagoty 3** (Oct. 1749); **Gautier-Dagoty 4** (Jan. 1756); **Montdorge 1** (1749); **Montdorge 2** (1755); **Montdorge 3** (1756); **Robert 2** (Jean; 1749); **Robert 3** (Jean; 1756). Gautier-Dagoty's last two letters of 15 March 1756 and 15 April 1756 were rejected for publication by the *Mercure de France*, so he published them himself at the time. They were reprinted in 1865 in the *Revue universelle des Arts*, 21 (1865): 506–524; **Gautier-Dagoty 5** (March–April 1756).

909

Le Blon (Paris 1756). Gautier-Dagoty was even forced to leave Paris and move back to his hometown of Marseille between 1756 and 1764; *Rodari 1996*: 105.

910

The long letter by Gautier-Dagoty in which he also explained his technique was published in two parts; **Gautier-Dagoty 2** (July 1749): 166–169; **Gautier-Dagoty 3** (Oct. 1749): 104–108.

911

The primary colours (*couleurs primitives*) Gautier-Dagoty used were: yellow ochre (C, *l'ocre claire ou commune*), vermillion (D, *le cinabre*) and ultramarine or Prussian blue (B, *l'outremer ou le bleu de Prusse*), combined with black (A, *le noir d'yvoire ou d'Allemagne*). For white he used the white of the paper (E, *réprésente le blanc de céruse ou de plomb, c'est le blanc du papier*); **Gautier-Dagoty 2** (July 1749): 169–172. He listed the same pigments in the second part of this letter: Frankfurt black, Prussian blue, yellow ochre and vermilion; **Gautier-Dagoty 3** (Oct. 1749): 104.

912

Desmaiseau 1 (1721); **Desmaiseau 2** (1722); **Le Blon** (London 1725): iv–v; *Singer 1903*: 263. The anatomical plate concerns a dissection of the male organ. A precise copy was produced by Jan Ladmiral in 1741, although the details are not as fine as those in Le Blon's print and the colours not that bright. Gautier-Dagoty made a partial copy in reverse for the lower half of *planche I* in: [Jacques Fabien] Gautier-Dagoty, *Exposition anatomique des maux vénériens, sur les parties de l'homme et de la femme, et les remedes les plus usités dans ces sortes de maladies*, Paris: Brunet & Demonville, 1773. Le Blon had planned a book on anatomy with 60 plates in 1740 and was offering subscriptions, but the project was abandoned on his death a year later. Le Blon's apprentice Jean Robert later finished an anatomical plate for the book, which he had started just before Le Blon's death; **Le Blon** (Stuttgart 1985): 31–38, 72–73, 144–145, figs 48, 49, 57.

913

Gascoigne 1997: 13; *Rodari 1996*: 112–132. Nevertheless, Gautier-Dagoty's works were appreciated in his time; **Tableaux imprimés 1** (1742); **Tableaux imprimés 2** (1745).

914

See Chapter 3, pp. 181 and 219.

915

See Chapter 3, p. 191.

916

The queen liked the work and ordered Bonnet to produce her portrait in the same manner after a painting by Carle Vanloo. Bonnet was promised 50 *Louis-d'ors* at the instigation of Charles-Nicolas Cochin the Younger (Bonnet was his protégé). This was confirmed by De Marigny in his letter of 30 September 1769, although no money was forthcoming at that time and Bonnet was not paid until 1 July 1771; **Bosse** (Paris, 3rd ed., 1745): 140–141, edited by Cochin who thus gives first-hand information; *Herold 1935*: 18–19; *Revue 1905*: 188–189. For an early reference to the volume see: **Meynier** (Hof 1804): 3.

917

The volume is in the Bibliothèque Nationale, Bibliothèque de l'Arsenal, Paris. A loose-leaf series of the eight prints showing the build-up of the print but without explanatory text is held by the National Gallery of Art, Washington, DC, Rosenwald Collection 1946.21.48; *Grasselli 2003*: 16–17. For reproductions of the colour separations see: *Grasselli 2003*: 68–71.

918

The text is reproduced in *Herold 1935*: 123–124, but is not quite correct. In particular, the transcription of the text opposite plate 8 concerning the use of white is incomplete with one line (*Cette couleur … traiter*) missing. Herold's transcription is copied literally in *Carlson & Ittmann 1984* (pp. 194, 196), and translated into English by *Grasselli 2003* (pp. 68–70), without due regard to the original text; see below for the complete text of the last page. I checked the text with the help of colour slides of the pages of the volume but without the title page.

920
Other versions built up from fewer plates do exist and Bonnet also issued a three-colour version in black, red and blue using two or three of the plates from the first version; *Grasselli 2003*: 70; *Lambert 1987*: 100 fig. 80a, p. 129 pl. IX.

920
The following is my transcription of the complete text concerning the white on the page opposite pl. 8: *Epreuve de la huitieme et derniere planche. Cette planche // imprimée de blanc donne les lumieres au tableau, adoucit la dureté des // noirs et détruit l'acreté du rouge. Cette couleur est la plus importante // et la plus difficile à traiter. Les blancs employés jusqu'à présent // ont le défaut de devenir jaunes ou noirs: mais l'auteur avoit découvert // depuis plusieurs années un blanc qui n'est point Sujet à cet inconvénient // et qui a Servi à donner la derniere valeur à Son ouvrage.*

921
Poppy oil, which darkens less than linseed oil, could be used instead of walnut oil; see above under 'Oils'.

922
Kühn et al. 1984: 19–20; *Lehmann 2000*. Analyses of the white ink on a selection of four of Bonnet's print showed the presence of lead white only; *Hallebeek et al. 1998*.

923
Portalis & Beraldi 1880–1882, 2 (1881): 463; *Prideaux 1968*: 59; *IFF-18*, 12-1: 8.

924
Laurentius 1980: 256–284.

925
Joannis Jacobus Bylaert produced a few works in red and black printed from two plates; **Bylaert** (Leyden 1772): 56, 58, pl. B. Johannes Cornelis de Bruyn printed some anatomical works in blue and red around 1830; *Stijnman 1995*: 45.

926
The English stipple engraver Simon Watts (1770s); *Burch 1983*: 86–87. German engravers, such as Christian Friedrich Boetius, Christian Rugendas, Johann Gottlieb Prestel and Maria Katharina Prestel; *Burch 1983*: 96; *Rebel 1981*: 68–69, pl. 29, 43, 48, 49.

927
Michels 1996: 273 no. 48, 277 no. 93–94; *Netzer 1987*: 88 & 90 no. 56, 98 & 100 no. 73.

928
Edlem von Keeß 1823, 2: 43.

929
Le Blon (Stuttgart 1985): 117–118.

930
Gautier-Dagoty's work was continued by his sons; *Rodari 1996*: 105.

931
Le Blon (Stuttgart 1985): 123, 127.

932
Boerner 1999: 46–47; *Cassinelli 2004*: XII–XIII, 5–9, 40–43; *Singer 1917–1918*: 58–73. Note that not all of Lasinio's colour prints are actually in four colours – he seems to have used less or more plates, *à la poupée* printing and hand-colouring as well according to Cassinelli and Singer.

933
Prideaux 1968: 62–72.

934
French patent, A.D. 1837, July 31.– No. 8848 for 10 years; the method was originally called *Lithocolore*, but was changed to *Chromolithographie* in the *Brevet d'addition et de perfectionnement* of 22 December 1837; **Le Blon** (Stuttgart 1985): 124–127; *Szrajber 2011*: 415–417. The firm had little success with the process, but the term 'chromolithography' became, and still is, used for lithographs printed in multiple colours and not just according to the four-colour system.

935
Cate & Grivel 1992: 20–21, 30, 38, 49–51, 112.

936
Reardon & Kirby 1991: 10.

937
The colours of a painting can be reproduced in perfect facsimile using modern offset and digital printing techniques, but the result is flat because the relief of the brushstroke is missing. Various techniques were used to produce facsimiles of oil paintings in the nineteenth century; *Bünsche 1995*. Henri Bogaerts invented a process called *Peinture Bogaerts* patented in 1878, which reproduced the image in colour lithography printed on primed canvas. The priming on which the image was printed was embossed with the relief of the original painting; *Altena et al. 1997*: 177–179; *Reproducing 1879*; *Silbermann 1907*: 454–455; *Verfahren zur Übertragung einer Nachbildung von Ölgemälden auf Getäfel, Leinwand und andere Flächen*, Henri Bogaerts in Bois le Duc (Holland), German patent, A.D. 1878, 6 June.–No. 3705.

938
See Chapter 1, p. 44.

939
Mortimer 1974: 252–253 no. 177.

940

Bowen & Imhof 2001: 264, 268, 270, 271, 275, 276–279, 284–285; *Bowen & Imhof 2008*: 339–340, 345; *Voet 1972*, 2: 221–222.

941

Voet 1972, 2: 221–222. Plate printers were already mentioned in the regulations of 1715, thus would have worked in the shop by that time; *Sabbe 1935*: 660.

942

Roger Gaskell kindly informed me about his observation that the engraved diagrams in the copy of this incunable in the Cambridge University Library are printed on fol. g1r and g2v, while the conjugate fol. g9 and g10 are printed with text; personal correspondence of 30 March 2012. Nikolaus Götz seems to have been the first to illustrate a book with engravings printed on the same paper as the text, see Chapter 1, p. 44.

943

Hofer 1934: 297.

944

Ambrogio Leone, engravings by Girolamo Mocetto, *De nola opusculum distinctum, plenum, clarum, doctum, pulcrum, verum, grave, varium et utile,* Venetia: Vercellani, 1514. *Mortimer 1974*: 371–373; *Stijnman 2009*: 38, no. 23. This is also the first instance of an engraver signing his book illustrations.

945

Platemarks or any relief may be flattened during the binding process when the book is placed in a standing press and prolonged storage of the sheets in a tightly closed binding may also flatten platemarks. German bookbinders habitually sized the printed sheets before binding because German printing papers commonly were not sized – after drying and flattening any relief may have been lost; *Prediger 1976*, 1: 13–15, brief remarks about binding in prints are found dispersed throughout the other three volumes.

946

Janssen 1986: 183 l. 722, 428 l. 819–820; *Moran 1978*: 32; *Pollak 1972*; *Stijnman 1992-1*: 23–24. Bowen calculated that in all three editions of the *Humanae salutis monumenta* (Antwerp 1571, 1575, 1581) the text was printed first and probably took between 1 and 3 months, and that it was followed by the printing of the engraved illustrations, which probably took from several months to perhaps a year; *Bowen 2003*: 8.

947

Bain 1966: 14, 20.

948

Haas 1984: 9–18, 145–147; *Prediger 1976*, 1: 12–15.

949

Mozaize historie der Hebreeuwse kerke (etc.), Amsterdam: Goeree, 1700, 4 vol. The message to the bookbinder is found in vol. 4: fol. 4Yv: *de Halve Vellen die Twee op een Blad gedrukt zijn*.

950

See Chapter 3, p. 144.

951

Bialler 1995: 30–34, 54–63, 68–77, 209–211; *Kemmer 2004*: 27–28; *Landau & Parshall 1994*: 270, 273–277.

952

Gnan 2007: 96–103; *Hinterding 2005*: 70–71, 94–95, 112; *Reed & Wallace 1989*: 16–17.

953

Oorspronkelyk en vermaard konstrijk tekenboek van Abraham Bloemaart, … gegraveert bij zijn zoon Frederik Bloemaart (etc.), Bernard Picart (ed.), Amsterdam: Ottens, 1740; produced by Frederick Bloemaert after drawings of his father made in 1650–1656. The title plate of part 1 (No. 1) and pl. No. 137 have backgrounds printed from two tone blocks, while six other plates have duplicates with one tone block; *Roethlisberger 1993*: 34, portrait of Abraham Bloemaert, cat. nos. T1 (two tone blocks), T80, T94, T95, T108, T137 (two tone blocks), T 144 and T145.

954

For example: *Edo Kanazawa [now part of Yokahama],* Hashimoto Chôgetsu, mid-nineteenth century, etching, colours printed with stencils; Braunschweig, Herzog Anton Ulrich-Museum, OA Gra 19. The Japanese stencil technique is called *kappa-zuri* and is used for printing designs on paper and textile.

955

Daniels (London 1971): 167; **Leaf** (New York 1976): 160–162; **Schober** (Göttingen, 3rd ed., 1974): 74–75; **Sternberg** (New York 1949): 128–129; **Trevelyan** (London 1963): 69.

956

Buckland-Wright (London 1953): 170–171; **Chamberlain** (London 1972): 172–173, 176–178; **Edmonson** (New York 1973): 53–56; **Gross** (London 1970): 138–139; **Hayter** (London 1949): 132–133; **Heller** (New York 1958): 188–189; **Leaf** (New York 1976): 162–163; **Peterdi 2** (New York 1959): 203; **Ross & Romano** (New York 1972): 120; **Saff & Sacilotto** (New York 1978): 167; **Trevelyan** (London 1963): 69, 72–73.

957

Black 1991; **Hayter** (London 1966): 146–147, 150–160; **Hayter** (New York 1981): 140–153. Viscosity colour printing is also known as 'viscosity printing'; Hayter preferred to call it 'simultaneous colour printing'; http://www.atelier17.com/a171.html (2010). For a monograph on the method see: **Reddy** (Albany 1988).

958

Black 1991: 410–414.

959

The effect of rolling inks of different viscosity on top of each other is due to the difference in the 'tack' of the inks used, ie the 'resistance of the ink film to splitting', an effect that is generally found in modern relief and offset printing; *Finley 1997*: 251. The order of ink viscosities may also be reversed, starting with the most viscous ink; *Black 1991*: 414, n. 13; **Reddy** (Albany 1988): 104–115. For a combination of digital plate making and viscosity colour printing see: *McCormick 2001*.

960

Fishpool (London 2009).

961

Whale & **Barfield** (London 2001): 75.

962

Only a few modern studies on the hand-colouring of prints have been published; *Bosters et al. 1989*: 95–129 (by Truusje Goedings); *Dackerman 2002*; *Goedings 1995*; *Keyser 1991*; *Landwehr 1976*: 19–50; *Miller 1987*; *Van Putten 2006*; *Schulz 1992*; *Van der Stock 1998*: 36–37, 124, 134 (more details spread throughout the text).

963

Fletcher et al. 2009; *Hind 1963-2*: 167–170.

964

Bury 2001: 49; *Dackerman 2002*: 102, 104 n. 3; *Van der Stock 1998*: 28, 47, 256, 257, note the difference between the illumination of manuscripts and the hand-colouring of prints; *Van der Waals 1988*: 144 col. 1 n. 62, 159 n. 62.

965

Chomel 1743, 2: 950.

966

Adeline (Paris 1894): 357–359; *Amman & Sachs 1568*: fol. Fiij vº (*Der Briefmaler*); *Dackerman 2002*: 17–18, 41, 67; *Hind 1963-2*: 171; *Keyser 1991*: 15–16; *Landau & Parshall 1994*: 221.

967

Dackerman 2002: 67–68, 196.

968

Augustyn 2003: 34.

969

Verheggen 2006: 123, 141, 142, 342.

970

Hodson 2 (London 1805): 361–362; **Liebhaber 1** (Nürnberg 1696): 538–539. Edward Orme, *Transparent Prints, Portraits, Books of Prints and Drawing Books*, London: Orme, 1806, 14 vols.; *Spelman 2009*, item 29, three transparent prints by Edward Orme.

971

See also the discussion above on the use of counterproofs for hand-colouring under 'Counterproof'.

972

Voit 1786–1790, 2: 98; **Ziegler** (Halle an der Saale, 3rd ed., 1922): 92 has a similar remark.

973

Krünitz 1792: 233.

974

A *Receuil de Peintures Antiques* (1798), a series of etchings by Johann Joseph Langehöffel, was printed in red before being hand-coloured; *Michels 1996*: 275–276 nos. 65–87. Schad gives a colour mixture of Frankfurt black, with dark and light ochres and a pinch of vermilion (the colours work as a toner and would give a dark reddish brown), which seems to have been used as a printing ink especially for prints to be hand-coloured afterwards; **Schad** (Augsburg 1800): 46 no. XVII.

975

Buonaccorsi (Ravensburg 1916): 106–107; **Ginkel 1** (Amsterdam 1981): 77; **Ginkel 2** (Utrecht 1985): 250; **Kok 1** (De Bilt, 1982): 75–76; **Maxwell** (Englewood Cliffs, 1977): 356–357; **Peterdi 2** (New York 1980): 331; **Piel** (Wiesbaden 1998): 36–41; **Schad** (Augsburg 1800): 1–14; **Spilsbury** (London 1794): 28–32; **Ziegler** (Halle an der Saale, 3rd ed., 1922): 91–93.

976

References to hand-colouring: **Academia Italica** (London 1666): 14ff; **Book of drawing** (London 1675): 10–16; **Compendium** (London 1797): 95–100; **Cröker** (Jena 1736): 150–152; **English academy** (London 1672): 32–36; **Excellency** (London 1668): 108–121; **Fokke 2** (Leyden 1805): 94; **Hodson 2** (London 1805): 361–362; **Liebhaber 1** (Nürnberg 1696): 577; **Praktisches Handbuch** (Gräz 1803): 125ff; **Valuable secrets** (London 1775): 108–113. Note that Bate compiled the first English manual with instructions for engraving and etching, which was also the first to contain recipes for 'colouring'; **Bate** (London 1634). For French books on painting techniques including instructions on the illumination of prints see: *Massing 1990*: nos. 8, 54.

977

Bosse (Nürnberg 1652).

978

Brugghen (Amsterdam 1616): fol. D3r–D4r.

979

Hartmann Schedel used to decorate and hand-colour prints he pasted into his books; *Dackerman 2002*: 99–101; *Landau & Parshall 1994*: 64; *Hernad 1990*: 38–39, 73. A manual by the Susse Brothers on painting and sculpture includes instructions for hand-colouring prints intended for 'painters and amateurs'; *Susse 1886*: 66–67. A Dutch housebook from the late eighteenth century contains some recipes for the colouring of mezzotints; Den Haag, Koninklijke Bibliotheek, Ms. 135 E 53: fol. 12ff.

980

Dackerman 2002: 18–19; *Dyson 1984*: 158–162. A number of these 'professionals' were children; *Keyser 1991*: 14–15.

981

Dackerman 2002: 191–193 (Georg Mack the Elder), 194–199 (Hans Mack), 213–215 (Johann Bechtholt), 223–225 (Georg Mack the Elder), 236 ('there are no known instances of a Dutch or Flemish colorist signing his work'), 239–247 (Domenicus Rottenhammer), 259–261 (Hans Thomas Fischer). An important Dutch colourer of a later generation is Dirck Jansz. van Santen (1637/38–1708), see Fig. 53, p. 52 and Fig. 54, p. 53.

982

Dyson 1984: 158, 160, 162.

983

Buonaccorsi (Ravensburg 1916): 107; *Keyser 1991*: 15–16.
984
Bain 1966: 19; *Buijnsters 2003*: 255–256; *Dyson 1984*: 158–162; *Limburg 2011*.
985
Augustyn 2003: 34; *Dackerman 2002*: 29–31.
986
Dackerman 2002: 31–37; *Shestack 1967*: nos. 18, 25, 26, 254, 258; *Valvekens 1987*: 211.
987
Dackerman 2002: 38–40; *Van der Waals 2006*: 15–17, 33, 36, 95–97.
988
Dackerman 2002: 28–29.
989
Bosters 1989: 95; **Hodson 2** (London 1805): 362; *López-Montes et al. 2008*; *Tsai 1992*; *Van der Waals 2006*: 17–18, 39, 53, 131.
990
Verheggen 2006: 62, 113, 173–176.
991
De schilderijkijker met zijne kinderen, vervat in twaalf omtrekplaatjes, meest naar het beroemde prentwerk, bekend onder den naam van het Parijsche Museum geschikt om den smaak voor kunst in kinderen op te wekken, Amsterdam: Berntrop, 1824. See also: *Putten 2006*.
992
See Chapter 1, p. 45.

Summary and Final Conclusions

This book focuses on developments in intaglio printmaking processes in order to discover what happened where and when, and what effect technique had on the outward appearance or style of the final product – the print. It is a history about people: how they worked and under what conditions; how they were educated and where their working materials came from; with whom they communicated about their craft and how their ideas about qualities in art stimulated the practice of printmaking. It demonstrates how new working manners influenced the style of prints, that technique and style are closely related to each other, and that the one is not subordinate to the other.

Intaglio printmaking involves creating textures into the surface of a flat plate in order to fill its grooves with ink, cleaning the surface and printing on a pliable support. In other words, the creation of the image consists of two separate procedures: the making of the plate and the printing of the plate. Together they determine how the print will look. Creating a design in the surface of a metal object, either by scratching with a hard point or engraving with a burin has been practised for many centuries, and filling grooves with a coloured substance is also long since known. The new graphic process that appeared in the Upper Rhine area in the 1430s and the actual invention that started intaglio printmaking was the replication (in reverse) of the intaglio design by transferring oil-based ink from the grooves of an engraved metal plate onto a sheet of paper; this could be repeated for printing an edition. Intaglio printing commonly used paper as the support because when damp, a sheet can easily be moulded into the grooves to pick up the ink. Damp parchment was also used but less so as it was expensive. Although introduced in Europe in the thirteenth century, paper quickly became available in large enough quantities to replace the more costly parchment by the early fifteenth century and it can be seen that the beginning of intaglio printmaking was directly related to the availability of paper at reasonable prices.

From the mid-fifteenth century on we see a steady development of intaglio printmaking. Information about the technique disseminated to other European regions, the quality of the printing ink improved, the roller press was invented around 1460, the etching of iron printing plates appeared in Augsburg in the mid-1490s, and etching copper plates began 20 years later in Italy and shortly afterwards in Holland. The first truly great printmaker, Albrecht Dürer (1471–1528), had produced a stylistically impressive oeuvre, an example for generations of engravers. Altogether intaglio printmaking can therefore be said to have reached maturity by 1525. The process had become fully professional by that time, and the technical and stylistic foundations, ie how it should be done and how it should look, were laid for the next five centuries. Subsequently intaglio printmaking spread to the east and the west, following European trade routes and colonisation, becoming the successful artistic process worldwide that it is today.

The further development of plate-making processes is evidenced by the series of inventions and reinventions throughout the ages. In a number of cases names of inventors or first users of particular etching and engraving techniques have come down to us – either because their experiments have survived, such as Lucas van Leyden's (1489/1494–1533) combination of etching and engraving, or because inventions were recorded in writing, such as John Evelyn's (1620–1706) notes and sketches of the mezzotint technique. Communication is of primary importance because without dissemination of information technical developments die out with their inventors. From the later eighteenth century onwards new techniques were published in journals as soon as considered appropriate by their inventors. Patents were issued that recorded designs of tools and machines, and engraving and printing processes in full detail. All this greatly stimulated the growth of the printing trade.

After the abolition of the guilds on the European continent around 1800, the introduction of photography and the expansion of the printing trade, engraving and etching images became a mere mechanical procedure. Personal interpretation, working manner and 'handwriting', the reasons for the prominence of so many renowned engravers and the pride of a legion of others, disappeared. The handcrafted print had made way for the large-scale mechanisation of the printing trade by the middle of the nineteenth century. The artist-etchers of the second half of the nineteenth century stepped back, maintaining an elite position that concluded – looking to the prints of their great predecessors – that a print could only be an original work of art if the plate was designed, produced and printed by the same individual, an attitude upheld by printmakers and print lovers until recently.

Printing the matrix is as much a part of the process of intaglio printmaking as engraving, as has already been mentioned. Both processes also experienced their own developmental paths: plate-making techniques enjoyed a series of historical highlights, these being more limited where plate-printing methods were concerned. Printing materials were generally available and paper, ink, press and cleaning materials developed only slowly. Due to increasing professionalism the making of the plate and the printing of the plate gradually separated in the course of the sixteenth century. Plate printing became a specialisation in its own right and at certain times and places the engraver was even prohibited by law from printing his own plates.

Intaglio colour printing is found continuously from the 1460s on, but the printing of any larger editions in colours does not seem to have been carried out before the late seventeenth century with the reintroduction of *à la poupée* printing by Johannes Teyler (1648–before 1709). Thereafter it was only because of the determined approach of Jacque Christoph Le Blon (1667–1741), who combined theory with practice, that a major step forward in intaglio colour printing was made by introducing trichromatic printing in blue, yellow and red ink. His groundbreaking work established the basis for all new colour methods used by the printing trade up to the present day. Consequently artist-etchers of the second half of the nineteenth century also turned away from colour, leaving this to the industry.

Etching and plate printing became standard in practical art education in the course of the twentieth century, with its own facilities and specially arranged studios. The number of professionals, students and amateurs in printmaking increased greatly from the 1960s – studios were extended and larger amounts of volatile chemicals used. This necessitated steps to be taken to deal with health and safety issues with regard to working conditions. Initially this happened through the installation of fume extractors, until demand grew for less or non-volatile grounds, solvents and acids in the 1990s. The development and application of these new materials created new challenges for printmakers, which in turn influenced the aesthetics of the print.

The history of the print is basically a history of printmaking techniques. Concept, composition and format may have been agreed upon in advance of the actual making of the print. The selection of materials and the choice of working methods, however, in combination with technical decisions made during the production process and the 'handwriting' of the creator, define the outward appearance of the final product – change just one element and the print will look different. The answer to the main question posed by this study about the coherence between technique and style is therefore that this relation is complete, as is demonstrated with many examples throughout the text.

This book goes beyond that, however, answering a number of technical questions from earlier literature by providing new documentary information or referring to information not commonly considered in the field of print studies nor by printmakers. An example is the start of etching copper printing plates after 1500, which can be linked to the increase of gunpowder production for warfare in that period. The available amounts of saltpetre (potassium nitrate), the essential constituent for gunpowder, also promoted larger scale distillation of nitric acid (hydrogen nitrate) a so-called mineral acid well suited for the etching of copper plates starting then. Another example is that many printmaking processes have their historical antecedents. To name a few, aquatint and crayon etching, invented in the eighteenth century, have their predecessors in the seventeenth and sixteenth century respectively. Modern printmakers, in the search for safer working procedures, began using the same materials as their predecessors of centuries past, such as cleaning with vegetable oil instead of volatile solvents and etching with a salts solution instead of mineral acid. Colour intaglio printing and printing on coloured supports have mediaeval roots. Colour, other than hand-colouring, can now be said to have been a constant factor in intaglio printing through all periods from the mid-1460s on. What has yet to be explored is for what functions, for what subjects, in what social circles, and when colour printing was more commonly accepted.

The material-technical aspects of printmaking history in this study have been given a sound basis by the detailed extraction of data from the exhaustive list of primary sources in the Bibliography of Practical Manuals (Appendix 4). This bibliography is the most extensive and up to date of its kind, to which a large amount of information from visual and material sources has been added, the whole supported by a generous selection of secondary literature. This abundance was necessitated by the absence of any similar work on the history of engraving and etching techniques to which I could refer and upon which I could continue. By compiling a general and at the same time detailed overview, this book fills gaps in our knowledge of the history of manual intaglio processes and consequently new questions have been raised. For example, an interesting topic for further study would be the social aspects within the printmaking business. The case of Simon Collin shows how a Paris master printer made the best of guild rules, despite suffering under the policies of the French government in the early eighteenth century. By marrying the widow of a printer, arranging for his children to marry other plate printers and all working together he tried to improve the family's economic situation. Paris plate printers as a group also decided to increase mutual cooperation and stricter observation of their own guild rules in this period.

A somewhat new territory in print studies concerns the worldwide dissemination of intaglio printmaking. Some hesitant steps have been taken in the past but the present study is the first to provide an all-encompassing overview, which merely shows how little we know about the subject. Students of print history are therefore encouraged to venture out and explore the beginnings and developments of intaglio printmaking in Asian, South American and African countries, and in Oceania.

However, there is one element within the economics of the print that would definitely benefit from further research:

the organisation of the print business as a whole. In particular, the study of the activities of the organisers of print productions requires greater emphasis because it is essential for our understanding of print history. Who organised a print or print series to be made, published and distributed? Who made the decisions? How was the market stimulated? Did the same person finance the project? What was his business network and how did this relate to his social network? In which cases were the inventor, the engraver, or the printer in charge of the project? From where did the necessary materials, equipment and assistants come? And for what reasons prints were produced? Certainly not just for the sake of art. Information is offered in the present study that could provide a promising start to such a research project.

General Chronology of Intaglio Printmaking Processes

This list is a compilation of the different chronologies in the chapters of the main text.

1435: the Master of the Playing Cards engraves copper plates and prints them on paper with black ink in the Upper Rhine area

1450: production of engraved print series in booklets

1460: intaglio printmaking in Tuscany and northern Italy

1460–1465: introduction of the roller printing press in the Upper Rhine area

1465: Master E.S. prints an engraving with white ink on black prepared paper

1470: introduction of the roller printing press in Italy

1475–1520: engravings are printed monochrome in blue, brown, green or red ink in Italy

1480: introduction of 'broad manner' engraving in Italy

1488: Franscisco Domenech produces an engraving in Spain

1495: Daniel Hopfer begins etching and printing iron plates in Augsburg

1500: recipe for black intaglio ink and printing by rubbing in an Italian manuscript

1500: Alessandro Rosselli is active as printer and publisher, not as engraver, in Florence

1509: *Passion* series by Lucas van Leyden, jigsaw plates with each of the nine prints having the same border printed from a separate plate

1514: the book *De Nola* by Ambrogio Leone is illustrated with engravings printed either in red or in blue ink

1515–1520: Marcantonio Raimondi produces some 40 etchings with additional engraving on copper printing plates in Rome

1515–1518: Albrecht Dürer produces six etchings on iron printing plates in Nürnberg

1520: Lucas van Leyden produces six etchings with additional engraving on copper printing plates in Leiden

1525: engraving by Agostino Veneziano printed *à la poupée* in red and blue ink

1530: etching combined with tone block printed in grey ink by Parmigianino

1530: engraving of musical annotation

1540: Marcello Fogolino applies a form of crayon etching

1543: the book *Geometria* by Augustin Hirschvogel is illustrated with his etchings

1548: Antwerp engraver Hieronymus Cock is the first specialist print publisher outside Italy

1550: etching of iron plates is discontinued

1550: multiple biting of etching plates by Augustin Hirschvogel and Hieronymus Cock

1550: appearance of the *schwellende Taille* in engraving

1555: the *Secreti* by Alessio Piemontese, published in Venice, includes a recipe for intaglio printing ink

1558: all crafts related to the printing trade are incorporated in the guild of St. Luke in Antwerpen

1560: use of stopping-out varnish for biting in stages by the brothers Doetechum

1563: establishment of the Accademia del Disegno by Giorgio Vasari in Florence

1565: posthumous portrait of the engraver Virgil Solis at his working bench by Balthasar Jenichen

1566: interior of an intaglio printshop by Arnold Nicolai

1566: women produce intaglio printing ink in Paris

1568: recipe for making an etching published by Benvenuto Cellini

1570: specialised engravers and plate printers in Italy

1572: jigsaw-plate etching by Konrad Saldörffer printed in red and black ink as title plate to *Von der Schiffart* by Nicolas de Nicolay

1574: contract stipulating the use of textile as support for intaglio printing in Venice

1590–1702: the book crafts, including plate printers, organise their own guilds in seven Dutch towns

1591: interior of an intaglio printshop designed by Johannes Stradanus

1591: type 1 wooden intaglio roller printing press

1591: engraved title plates in Japanese books published by the Jesuit mission in Japan

1593: jigsaw-plate etching by Wendel Dietterlin also printed *à la poupée* in red and black ink as title plate to his *Architectura*

1613: engraving produced in Lima (Peru) to commemorate the funeral of the Spanish queen Margarita

1613: title plate to part 4 of *Theatrum machinarum* by Heinrich Zeisingk printed *au repérage* from two plates in red and black ink

1615: Samuel van der Straet publishes his engraving *Virgin of Guadalupe* in Mexico City

1616: recipe for making a black pigment for intaglio printing ink by charring vine lees

1630: recipes for etching grounds that are mixtures of asphaltum, resin and wax

1640, 1644, 1651: three attempts fail to establish a guild for engravers in Paris

1641 & 1643: Mattheus Merian and Abraham Bosse each depict the interiors of an engraver's studio and a plate printshop in two separate images

1642: mezzotint invented by Ludwig von Siegen

1642: Frankfurt black for intaglio printing ink comes from Germany

1643: type 2 wooden intaglio roller printing press

1645: Abraham Bosse publishes his *Traicté des manieres de graver en taille douce sur l'airin*

1645: Frankfurt black, a pigment for intaglio ink made from charred wine lees, is traded from Frankfurt am Main

1648: establishment of the Académie Royale de Peinture et de Sculpture in Paris

1650: Russian artist Simon (Ssemjon) Ušakov makes etchings

1652: Jan van de Velde IV uses dust-grain aquatint

1655: engravers are admitted to the Académie Royale de Peinture et de Sculpture in Paris

1660: the French *Edict de St. Jean de Luz* states that engravers are not craftsmen and free from guild regulation

1692: establishment of the Paris guild of plate printers

1695: full-metal roller printing press constructed in Paris

1700: tin printing plates for musical annotation

1701: Thomas Emmes engraves a portrait of the Reverend Increase Mather in Boston, Massachusetts, USA.

1705: publication of a book illustrated with 43 plates cut by native engravers in Paraguay

1710: mezzotints printed *au repérage* in blue, yellow and red ink by Jacque Christoph Le Blon

1712: Italian Matteo Ripa gives a demonstration of the etching technique to the Chinese emperor

1719: Ibrahim Müteferrika practises inaglio printing in the Ottoman Empire

1734: French engravers are allowed to own roller presses for proofing their plates, but not for printing editions

1745: type 3 wooden intaglio roller printing press

1752: establishment of the Academy of San Fernando in Madrid, includes a course on engraving

1754: wove paper produced by James Whatman the Elder

1756: crayon etching by Cornelis Ploos van Amstel

1756: crayon engraving by Jean-Charles François

1767: French engravers produce a series of 16 prints with battle scenes for the Chinese emperor

1768: reinvention of dust-grain aquatint by Jean Baptiste Le Prince

1771: soft-ground etching by Benjamin Green

1774: liquid-grain aquatint by Paul Sandby

1781: English engraver James Peachey makes an etching in Canada

1783: Shiba Kôkan produces an etching in Edo (Tokyo), Japan, after studying Dutch sources

1790: English engravers produce maps in India

1790: ruling machine for straight lines in printing plates by Wilson Lowry

1790: etching glass printing plates

1791: abolition of the guilds in France followed by the rest of Europe except England

1800: zinc printing plates for etching

1802: Englishman John William Lewin makes etchings in Australia

1809: steel printing plates are engraved by C.P. Molard

1810: steel printing blocks for engraving papers of value by Jacob Perkins

1810: cast-iron roller printing press designed by Jacob Perkins

1813: introduction of metal roller printing presses and steel engraving in England

1818: establishment of ink manufacturer Charles Lorilleux in Paris
1819: thin steel printing plates for engraving by Charles Warren Heath
1819: patent for a partly mechanised roller printing press by Jacob Perkins
1820: increase of intaglio printmaking in London, Paris, Vienna and throughout Germany
1825: etching steel printing plates
1839: presentation and publication of the patent of the daguerreotype in Paris on 19 August
1840: electrotype and electrolytic etching by Thomas Spencer and John Wilson
1840: development of photomechanical processes causing a separation of the graphic arts from the printing trade
1848: Dutch mordant by H. Schwarz and Rud. Böhme
1848: establishment of the Haagsche Etsclub in Den Haag
1850: amateurs and artist-etchers start printing their own plates
1852: photomechanical etching by William Henry Fox Talbot
1857: steelfacing copper intaglio printing plates by Garnier
1860: Auguste Delâtre organises an etching class at the School of the South Kensington Museum in London
1862: establishment of the international Société des Aqua-fortistes by Alfred Cadart in Paris
1866: Maxime Lalanne publishes his *Traité de la gravure à l'eau-forte*
1875: Italian Edoardo Chiossone introduces modern printmaking techniques in Japan
1876: patent for a fully mechanised roller press for intaglio printing by Constantin Guy
1879: photogravure by Karl Klič
1880: roller mills for grinding intaglio printing ink on industrial scale
1895: rotogravure by Karl Klič
1910: publication of the monograph on the plate printer Frederick Goulding
1910: rotogravure printing is mechanised
1914: Italian Carlos Oswald organises an etching course in Rio de Janeiro, Brazil
1927: establishment of Atelier 17 in Paris by Joseph Hecht and Stanley William Hayter
1930: etching and plate printing become standard in the curricula of art schools
1930: metal pieces soldered together to make printing plates by Rolf Nesch
1940: use of power tools to cut and mill intaglio plates
1940: viscosity colour printing by Stanley William Hayter
1955: collagraph by Glen Alps
1960: revival of mezzotint
1965: revival of photogravure for artistic purposes
1965: growing numbers of printmaking courses, suppliers of artists' materials and press manufacturers
1965: steel roller printing presses
1985: light-sensitive intaglio printing plates by Eli Ponsaing and Dan Welden
1990: attention to safer working procedures in the studio with consequent change of materials and aesthetics
1990: acrylic-based intaglio printing inks
1991: electrolytic etching by Nik Semenoff and Christine Christos, simultaneously with Marion and Omri Behr
1992: combinations of manual intaglio printmaking techniques with digital processes
1993: acrylic etching grounds by Mark Zaffron
1994: light-sensitive polymer films for intaglio printmaking by Mark Zaffron, promotion by Keith Howard
1995: decline and loss of printmaking facilities in North America, western Europe and Australia
1996: etching aluminium printing plates with a copper sulphate and kitchen salt solution by Nik Semenoff
1996: etching zinc printing plates with a copper sulphate solution by Cedric Green
1997: etching copper printing plates with a ferric chloride and citric acid solution by Friedhard Kiekeben
2001: etching steel printing plates with a copper sulphate and kitchen salt solution by Friedhard Kiekeben and Charles Morgan simultaneously
2002: water-washable intaglio printing inks

Early Engravers up to 1500

The following list is a compilation of data concerning fifteenth-century engravers of intaglio copper plates as referred to in: *Geisberg 1923*, *Hind 1963*, *Lehrs 1908–1934*, *Levenson 1973* and *Thieme-Becker*, vol. 37: *Meister mit Notnamen und Monogrammisten* with additional details.

The list is not exhaustive, but serves as an overview of early engravers, where and when they worked and what other activities they were involved in apart from working as copper engravers.

Please note:

some groups of prints show different hands between them but are still are entered under one name waiting for further study. For example, *Lehrs* (1: 149–207) gives a list of 88 engravings of the 'school of the Master of the Playing Cards'.

Maso Finiguerra is not included because he was not active as a printmaker.

by means of the periods and areas in the table below a map is compiled of the dissemination of engravers in the fifteenth century (see Fig. 58, p. 56).

the spelling of names, transcription of personal marks and personal data in this list may occasionally differ from those in the reference works depending on additional details and typography.

Period: estimated period of activity, if possible followed by personal data between brackets (…).

Engraver: unidentified Masters, (N.N.) and actual names.

Area, town: place of activity, attributed to an area on account of style, or to a town.

Profession: professional background or further activities other than engraving.

Terms in Print Addresses

Introduction

A large variety of – mainly printed – terms can be found on prints from the early modern period onwards. They supply information about who was involved in the production and edition of the work. Place and year of publication, as well as any printing privileges are also mentioned.

These references are usually engraved or etched at the bottom of the plate, in the so-called 'address'; they are rarely found in woodcuts. The address appeared by the middle of the fifteenth century and became standard in the sixteenth century. It is still commonly found on nineteenth-century lithographs and steel engravings. This tradition disappeared in the first half of the twentieth century. Nowadays, the artist's name, title, year and edition number are written in pencil in the margin underneath the impression or on the back of the print, a practice that developed in the second half of the nineteenth century.

List of Authorised Contents and Functions in Addresses

The list below contains the authorised contents and functions in addresses (in alphabetical order), with abbreviations and expressions given in Dutch, English, French, German, Italian and Latin. It is based on similar lists with further terms added. The intention is to give a uniform explanation of the many terms that can be found in prints. Nevertheless, in practice these terms are less well defined and often appear exchanged. This list is followed by a glossary of all the abbreviations and expressions, with reference to the terms and short explanations in the list. Note that more abbreviations and terms can be found but those following will help to understand them.

Address = information that can be found at the bottom of the print = address, adres, Adresse, indirizzo
 Before adding text = avant la lettre, avant toutes lettres, antilettera, avantilettera, before letters, before any text, voor de letter, voor alle letters
 After adding text = après la lettre, after letters, na de letter
 Without text = sans lettre, sans aucune lettre, senza lettera, without any text, without letterpress, zonder op- of onderschrift
Architect = aedificator, architectus; see also *Draughtsman*, *Inventor of the image* and *Painter*
 Has built = aedificavit, edivicavit from the Latin verb 'aedificare'
Book Printing = typography, typographically printed text
 Has printed the text = ex typis, typis, typis express., from the Latin noun 'typus', indicates the person in control of the matrix, usually the printer-publisher; in later references commonly the printer; copper plates are indicated by 'aeneis typis', however; see also *Owner of the printing plates* and *Publisher > Has published*
Compiler of the text
 Has written the text = accidebat from the Latin verb 'accidere' (?), ludebat from the Latin verb 'ludere'
Coordinator = director
 Has coordinated the production = dierexit, dir., direx., direxit, dirigens, from the Latin verb 'dirigere'; see also *Pub-*

lisher

Copy = indication of the person who had a copy or replica made after the original plate

    Had made the copy = restituit, from the Latin verb 'restituere'; see also *Example for the image*

Dealer = venditor; also mercator

    Sells, sell = prostat, prostant, exemplaria prostant, from the Latin verb 'prostare'

Dedication = dedicatio

    Dedicated = D.D., D.D.D., D.D.D.D., dedet, dedicavit et dat, dedit dedicavitque, dicat, from the Latin verb 'dedicare', dat from 'dare'; also consecrat

Draughtsman = delineator, also deliniator; usually the person who made a drawing after the original building, painting, reflief or sculpture, also the person who made the original design for the print; see also *Architect*, *Inventor of the image* and *Painter*

    Has drawn = d., de., del., deli., delie., delin., delineavit, delit., delt., from the Latin verb 'delineare'; also abgezeichnet, deline infudit, delineatae, descripsit, desig., designavit, dess. par, dessin. par, dis., disegno, effig., effigiavit, fig., figur., figurabat, figuravit, gezeichnet von; see also *Inventor of the image > Has drawn*

Edition = the edition number can be settled by contract, but is never given in the plate; this information starts appearing – written in pencil – underneath the impression by the second half of the nineteenth century; commonly the number in the edition and the total number of impressions is given, such as: 23/50 or II/XX, and also for offprints: h.c. II/V; see also *Proof*

Engraver = aeris caelator, chalcographus, caelator, coelator, excusor, intagliatore, scalptor, sculptor

    Studio of the engraver = caelatura; see also *Printer > Printshop*

    Has engraved = cae., cael., caelab., caelavit, from the Latin verb 'caelare', derived from the Greek verb ϰυ'excavate, 'hollow out'; in cisum, inc., inci., incidebat, incidit, incisit, incisum, insidit, from the Latin verb 'incidere'; exculpsit, s., sc., scalp., schul., schulp., schulpxit, sct., scu., sculp., sculpcit, sculpebat, sculps., sculpsit, sculpt., sculpxit, from the Latin verb 'sculpere'(commonly used with etchings, too); also esc., gest. von, gestochen von, gravé par, incise, scolpi á bulino, sculpsit ferro (has engraved with the burin); NB, occasionally also excudit, see *Publisher > Has published*

    Has engraved or etched in copper = one of the above terms combined with: aere, in aere, in aes; also aeri aqua forti inscriptae, aeri infudit, aere exarat, delineatio aere exarata, in aes incisa, in Kupffer gebracht

    Has engraved or etched in steel = Stahlst.

    Has etched = a.f., aqua, aquaforti, f. aqua, fecit aqua forti, fecit in aqua ford. (*sic*), but also forms of 'sculpere'; also gravé à l'eau-forte par

    Has etched with aquatint = aq:tinta, aquatinta

    Has etched the photogravure = ph. sc., photogravure sculpsit, photosculpsit

    Has engraved the letters = écrit, scrip., scripsit, from the Latin verb 'scribere'

    Has finished the work = perfecit, from the Latin verb 'perficere'; also terminé, terminé au burin (has finished the work with the burin)

    Has made = f., fac., faciebat, fc., fe., fec., fecer. (from fecerunt, when two or more persons worked on the plate), fecit, fect., fet., ft., from the Latin verb 'facere'; gemaakt, verfertigt

    Has re-engraved = reparavit

Example for the image; see also *Copy > Has made the copy*

    After life = ad vivum, d'après nature, nach der Natur

    After the original = ex archetypis

    After a drawing, painting or print = après, gravure d'interpretation

Financer = creditor

    At the expenses of = a costa de, a spese di, suis impensis, sump., sumptibus; usually the publisher see *Publisher*; see also *Patron > Has caused to be made*

Inventor of the image = inventor, the person who made the draught, or the larger part of the example (building, painting, relief, sculpture, drawing) respectively the larger part of the composition on which the print is based; also figurator, infentor (*sic*), inventeur; see also *Architect*, *Draughtsman* and *Painter*

    Has invented = inv., inve., inven., inveniebat, invenit, from the Latin verb 'invenire'; also concepit, delectum (actually 'has selected' the subject), designed by, erf. von 'erfunden', ex inventione, inventé par

    Has designed (the composition) = comp., composuit, cop., from the Latin verb 'componere'; also dressé

    Has cooperated in making the design = orn., ornav., ornavit, from the Latin verb 'ornare'

    Has drawn = fig., figurabat, figuravit, from the Latin verb 'figurare'; also effigitavit; as well as del., delineavit, from the Latin verb 'delineare'; see also *Draughtsman > Has drawn*

Lithograph = imp. Lith., impression lithographique, L.D., lith. Druck, St. V., Stdr. V., Steindr. V., Steindruck von

    Has made the lithograph = in lap. del., lith., litho., lithog., lithographié par, lithotint, on stone by

    Lithographic printshop = imp. Lith., impression lithographique, L.D., lith. Institut

Maker
 From the workshop = ex officina; see also *Printer > Printed by the artist*
Owner of the printing plates = aeneis formis, f., for., formeis, formis, from the Latin noun 'forma', aeneis typis; usually the publisher, see also *Book Printing > Has printed the text*, *Printer* and *Publisher > Has published*
Painter = pictor, pictrix; see also *Architect*, *Draughtman* and *Inventor of the image*
 Has painted = p., pictum, pin., ping., pingebat, pinx., pinxit, pinxt., from the Latin verb 'pingere'; also dipense, effig. pinx., gemalt von, peint
 After the original = juxta Exemplar
 After the original painting = after, d'apres, da
Patron = the person who commissioned the work
 Has caused to be made = f.f., fieri fecit; see also *Financer* and *Publisher > Has published*
Plate, see: *Owner of the printing plates*
Printer = impressor; see also *Owner of the printing plates*
 Has printed = imp., impressit, imprimit, from the Latin verb 'imprimere'; also de l'impression de, stampati da; can also be used by the publisher, because the printer and publisher are often the same person until the middle of the seventeenth century; see also *Publisher > Has published*
 Has printed in colours = coloribus distincta typis impressa
 Plate printer = impressor imaginum aeri incisarum
 Printshop = chalcographia, officina; see also *Engraver > Studio of the engraver*
 Printed by the artist, see: *Book Printing > Has printed the text* and *Proof > Artist's proof*; see also *Maker*
Privilege = avec privilege, c.p., con privilegio, cum p., cum previligio, cum pr., cum priv., cum privi., cum privil., cum privil. ord., cum privileg., cum privilegio, privilegio, privilegium; also dép., déposé
 With permission = licentia, licenza, permissu
Proof = épreuve d'essai, proefdruk, prova di stampa, Werkstattprobe; see also *Edition*
 Artist's proof, before printing the edition = a.p., é.a., Werkstattprobe, é.d'a., eigen druk, épreuve d'artiste, p.a., p.d.a., prova d'artista; also Handdruck
 Etching proof = épreuve de remarque, épreuve avec remarque, Ätzprobe am Papierrand, proef met remarques, prova di etichetta, remarque proof
 Colour proof = c.t.p., colour trial proof
 Proof by the printer = p.p., p/p, printer's proof
 Trial proof = épreuve d'état, proof impression, state, prova di stato, Plattenzustand, staat, t.p., Zustand
 Ready to print = b.a.t., bon à tirer, approved for printing, good to pull, OK for printing, buona a stampare, klaar voor de druk
 Outside the edition, not meant for sale = épreuve de passe, h.c., h/c, hors commerce, hors de commerce
 Proof to check that the plate is unusable after it is scored with a drypoint or a part is cut off = cancellation proof
Publication according to the law = published as the act directs; expression used in England only
Publisher = ed., Verlag v.,Verlag von, zu finden beij, zu finden bey; when the print is sold by a book dealer also lib., librairie, Buchhandlung
 Has published = ex., exc., excu., excud., excude., excudebat, excudebatur, excudens, excudit, excusum, excutit, exk., from the Latin verb 'excudere'; NB, excudit occasionally means 'has engraved', see *Engraver > Has engraved*; also aeditae, auszgangen, bei, beij, bey, bij, by, ches, chez, curabat, curavit, from the Latin verb 'curare', div., divulg., divulgavit, from the Latin verb 'divulgare', en casa de, express., expressa, expressit from the Latin verb 'exprimere', in lucem aeditae, in lucem misit, presentirt, uitgegeven; see also *Book printing*, *Coordinator*, *Owner of the printing plates*, *Patron* and *Printer > Has printed*
Wood engraver = graveur sur bois, houtgraveur, wood engraver; see also *Woodcutter*
 Studio for wood engraving = X. A. (Xylographische Anstalt)
Woodcutter = Holzschneider, graveur sur bois, tailleur de bois, xylographe, houtsnijder, wood cutter, xilografo; also scalptor, sculptor, although these terms are more commonly used for *Engraver*, see there; see also *Wood engraver*
Year = year of engraving or etching of the plate, rarely the year of printing or publishing
 In the year = A., an., Aº, anno; also A.d.g. = A[nno] d[ivinae] g[ratiae]

Glossary

The following glossary of abbreviations and expressions is compiled from the above list of authorised contents and functions in addresses. See above list for further explanations and comparable terms.

a costa de   at the expenses of
a spese di   at the expenses of
A.   in the year
A.d.g.   in the year
a.f.   has etched
a.p.   artist's proof
abgezeichnet   has drawn
accidebat   has written the text
ad vivum   after life
address   address
adres   address
Adresse   address
aedificator   architect
aedificavit   has built
aeditae   has published
aeneis formis   owner of the printing plates
aeneis typis   owner of the printing plates
aere …   has engraved or etched in copper
aere exarat …   has engraved or etched in copper
aeri aqua forti inscriptae   has engraved or etched in copper
aeri infudit …   has engraved or etched in copper
aeris caelator   engraver
after   after the original painting
after letters   after adding text
an.   in the year
anno   in the year
Aº   in the year
antilettera   before adding text
approved for printing   ready to print
après   after a drawing, painting or print
après la lettre   after adding text
aq:tinta   has etched with aquatint
aqua   has etched
aquaforti   has etched
aquatinta   has etched with aquatint
architectus   architect
artist's proof   printed by the artist
Ätzprobe am Papierrand   etching proof
auszgangen   has published
avant la lettre   before adding text
avant toute lettre   before adding text
avantilettera   before adding text
avec privilege   privilege
b.a.t.   ready to print
before any text   before adding text
before letters   before adding text
bei   has published
beij   has published
bey   has published
bij   has published
bon à tirer   ready to print
Buchhandlung   publisher
buona a stampare   ready to print
by   has published
c.p.   privilege
c.t.p.   colour proof
cae.   has engraved
cael.   has engraved

caelab.   has engraved
caelator   engraver
caelatura   studio of the engraver
caelavit   has engraved
cancellation proof   proof to check whether the plate is unusable
chalcographia   printshop
chalcographus   engraver
ches   has published
chez   has published
coelator   engraver
coloribus distincta typis impressa   has printed in colours
colour trial proof   colour proof
comp.   has designed (the composition)
composuit   has designed (the composition)
con privilegio   privilege
concepit   has invented
consecrat   dedicated
cop.   has designed (the composition)
creditor   financer
cum p.   privilege
cum pr.   privilege
cum previligio   privilege
cum priv.   privilege
cum privi.   privilege
cum privil.   privilege
cum privileg.   privilege
cum privilegio   privilege
curabat   has published
curavit   has published
d.   has drawn
D.D.   dedicated
D.D.D.   dedicated
D.D.D.D.   dedicated
d'apres   after the original painting
d'après nature   after life
da   after the original painting
de l'impression de   has printed
de.   has drawn
dedet   dedicated
dedicatio   dedication
dedicavit et dat   dedicated
dediée   dedicated
dedit dedicavitque   dedicated
del.   has drawn
delectum   has invented
deli.   has drawn
delie.   has drawn
delin.   has drawn
deline infudit   has drawn
delineatae   has drawn
delineatio aere exarata …   has engraved or etched in copper
delineator   draughtsman
delineavit   has drawn
deliniator   draughtsman
delit.   has drawn
delt.   has drawn
dép.   privilege
déposé   privilege

descripsit   has drawn
desig.   has drawn
designavit   has drawn
designed by   has invented
dess. par   has drawn
dessin. par   has drawn
dicat   dedicated
dierexit   has coordinated the production
dipinse   has painted
dir.   has coordinated the production
director   coordinator
direx.   has coordinated the production
direxit   has coordinated the production
dirigens   has coordinated the production
dis.   has drawn
disegno   has drawn
div.   has published
divulg.   has published
divulgavit   has published
dressé   has designed (the composition)
é.a.   artist's proof
é.d'a.   artist's proof
écrit   has engraved the letters
ed.   publisher
editor   publisher
edivicavit   has built
effig.   has drawn
effig. pinx.   has painted
effigiavit   has drawn
effigitavit   has drawn
eigen druk   artist's proof
en casa de   has published
eng.   has engraved
engd.   has engraved
épreuve avec remarque   etching proof
épreuve d'artiste   artist's proof
épreuve d'essai   proof
épreuve d'état   trial proof
épreuve de passe   outside the edition
épreuve de remarque   etching proof
erf.   has invented
esc.   has engraved
ex archetypis   after the original
ex inventione   has invented
ex officina   from the workshop
ex typis   has printed the text
ex.   has published, (rarely: has engraved)
exc.   has published, (rarely: has engraved)
excu.   has published, (rarely: has engraved)
excud.   has published, (rarely: has engraved)
excude.   has published, (rarely: has engraved)
excudebat   has published, (rarely: has engraved)
excudebatur   has published, (rarely: has engraved)
excudens   has published, (rarely: has engraved)
excudit   has published, (rarely: has engraved)
exculpsit   has engraved
excusor   engraver
excusum   has published

excutit   has published, (rarely: has engraved)
exemplaria prostant   sell (plural)
exk.   has published
express.   has published
expressa   has published
expressit   has published
f. [= fecit]   has made
f. [= formis]   owner of the printing plates
f. aqua   has etched
f.f.   has caused to be made
fac.   has made
faciebat   has made
fc.   has made
fe.   has made
fec.   has made
fecer.   have made (plural)
fecit   has made
fecit aqua forti   has etched
fecit in aqua ford.   has etched
fect.   has made
fet.   has made
fieri fecit   has caused to be made
fig.   has drawn
figur.   has drawn
figurabat   has drawn
figurator   inventor of the image
figuravit   has drawn
for.   owner of the printing plates
formeis   owner of the printing plates
formis   owner of the printing plates
ft.   has made
gest. von   has engraved
gestochen von   has engraved
gezeichnet von   has drawn
good to pull   ready to print
gravé à l'eau-forte par   has etched
gravé par   has engraved
graveur sur bois   woodcutter or wood engraver
gravure d'interpretation   after a drawing, painting or print
h.c.   outside the edition
h/c   outside the edition
Handdruck   artist's proof
Holzschneider   woodcutter
hors commerce   outside the edition
hors de commerce   outside the edition
houtgraveur   wood engraver
houtsnijder   woodcutter
imp.   has printed
imp. lith.   lithograph, lithographic printshop
impression lithographique   lithograph, lithographic printshop
impressit   has printed
impressor   printer
impressor imaginum aeri incisarum   plate printer
imprimit   has printed
in aere …   (has engraved or etched) in copper
in aes …   (has engraved or etched) in copper
in Kupffer gebracht   (has engraved or etched) in copper
in lap. del.   has made the lithograph

in lucem aeditae   has published
in lucem misit   has published
in cisum   has engraved
inc.   has engraved
inci.   has engraved
incidebat   has engraved
incidit   has engraved
incise   has engraved
incisit   has engraved
incisum   has engraved
indirizzo   address
infentor   inventor of the image
insidit   has engraved
intagliatore   engraver
inv.   has invented
inve.   has invented
inven.   has invented
inveniebat   has invented
invenit   has invented
inventé par   has invented
inventeur   inventor of the image
inventor   inventor of the image
juxta Exemplar   after the original
klaar voor de druk   ready to print
L.D.   lithograph, lithographic printshop
lib.   publisher
librairie   publisher
licentia   with permission
licenza   with permission
lith.   has made the lithograph
lith. Druck   lithograph
lith. Institut   lithographic printshop
litho.   has made the lithograph
lithog.   has made the lithograph
lithographié par   has made the lithograph
lithotint   has made the lithograph
ludebat   has written the text
mercator   dealer
na de letter   after adding text
nach der Natur   after life
officina   printshop
OK for printing   ready to print
on stone by   has made the lithograph
orn.   has cooperated in making the design
ornav.   has cooperated in making the design
ornavit   has cooperated in making the design
p.   has painted
p.a.   artist's proof
p.d.a.   artist's proof
p.p.   proof by the printer
p/p   proof by the printer
peint   has painted
perfecit   has finished the work
permissu   with permission
ph. sc.   has etched the photogravure
photogravure sculpsit   has etched the photogravure
photosculpsit   has etched the photogravure
pictor   painter (male)

pictrix   painter (female)
pictum   has painted
pin.   has painted
ping.   has painted
pingebat   has painted
pinx.   has painted
pinxit   has painted
pinxt.   has painted
Plattenzustand   trial proof
presentirt   has published
printer's proof   proof by the printer
privilegio   privilege
privilegium   privilege
proef met remarques   etching proof
proefdruk   proof
proof impression   trial proof
prostant   sell (plural)
prostat   sells
prova d'artista   artist's proof
prova di etichetta   etching proof
prova di stampa   proof
prova di stato   trial proof
published as the act directs   publication according to the law
remarque proof   etching proof
reparavit   has re-engraved
restituit   had made the copy
s.   has engraved
sans aucune lettre   without text
sans lettre   without text
sc.   has engraved
scalp.   has engraved
scalptor   woodcutter, engraver
schul.   has engraved
schulp.   has engraved
schulpxit   has engraved
scolpi à bulino   has engraved (with the burin)
scrip.   has engraved the letters
scripsit   has engraved the letters
sct.   has engraved
scu.   has engraved
sculp.   has engraved
sculpcit   has engraved
sculpebat   has engraved
sculps.   has engraved
sculpsit   has engraved
sculpsit ferro   has engraved (with the burin)
sculpt.   has engraved
sculptor   woodcutter, engraver
sculpxit   has engraved
senza lettera   without text
St. v.   lithograph
staat   trial proof
Stahlst.   has engraved or etched in steel
stampati da   has printed
state   trial proof
Stdr. v.   lithograph
Steindr. v.   lithograph
Steindruck von   lithograph

suis impensis   at the expenses of
sump.   at the expenses of
sumptibus   at the expenses of
t.p.   trial proof
tailleur de bois   woodcutter
terminé   has finished the work
terminé (au burin)   has finished the work (with the burin)
trial proof   proof
typis   has printed the text
typis express.   has printed the text
uitgegeven   has published
venditor   dealer
verfertigt   has made
Verlag v.   publisher
Verlag von   publisher
Versuchsprobedruck   proof
voor alle letters   before adding text
voor de letter   before adding text
Werkstattprobe   proof
without any text   without text
without letterpress   without text
wood cutter   woodcutter
wood engraver   wood engraver
X. A.   studio for wood engraving
xilografo   woodcutter
xylographe   woodcutter
zonder op- of onderschrift   without text
zu finden beij   publisher
zu finden bey   publisher
Zustand   trial proof

Bibliography of Practical Manuals

<extp1>It is well known that bibliographical repertories concerning any science or theme are fundamental tools for their advancement. A large part of research time has to be spent on the arduous task of bringing together the bibliographical material.<end ext>

Juan Carrete Parrondo[1]

The present book started from practical printmaking experiences and grew exponentially by the study of textual sources on engraving and etching techniques. The treatises in the bibliography bear witness to the working practices of their times. They are therefore our guides to the past, providing us with a better understanding of the prints that have survived.[2]

Manuals and their Influence

Hundred of manuals have been published since Abraham Bosse issued the first monograph on engraving, etching and plate printing. Some earlier printed texts exist, some manuscripts that we know of, and from the eighteenth century on articles on the techniques and materials of engraving and etching, on paper, ink, presses and equipment appeared in periodicals. Among these, most influential were the monographs of Bosse, Lalanne and Hayter with his followers. These men and their publications are the landmarks in the developments of intaglio printmaking methods around whom many highlights circulate.

Abraham Bosse

The first printed book of interest to us is Alessio Piemontese's *Secreti* (1555), one of the earliest of many published compilations filled with all kinds of recipes. Its chapter on art techniques has a prescription for preparing intaglio printing ink.[3] Monograph manuals aimed at professional artists and craftsmen started to appear in the second half of the sixteenth century and they also contain information for the printmaker. Cellini's handbook for the goldsmith and sculptor, the *Due trattati* (1568), is the oldest printed text with a chapter on etching a copper intaglio printing plate.[4] His treatise was followed by Gerard ter Brugghen's *Verlichtery kunst-boeck* (1616) on painting with watercolours.[5] Perhaps this publication should be seen as a series of guidelines for illuminating prints and from that point of view it is understandable that at the end there is a chapter containing instructions on etching and making printing ink.

   Bosse's *Traicté des manieres de graver* (1645) was the first monograph manual on intaglio printmaking. It contains step-by-step instructions on the techniques of etching, engraving and intaglio printing, including plans and descriptions for constructing a roller press. The introduction has a discourse on aesthetics and references to Bosse's predecessors. The impact of this seemingly modest treatise is remarkable. Within a few years the booklet circulated in Holland and Germany.[6] The treatise was often edited, translated and copied, being an example for all others following; see the pedigree of Bosse's treatise (Box 1). Many engravers as well as authors of other technical manuals and books on print collecting referred to it because it had proved itself to be a detailed and trustworthy source of practical information.[7] Even modern authors of handbooks on printmaking techniques found his recipes worthwhile enough to cite,[8] and the book is often referred to by art historians.

Manuals and articles on intaglio printmaking appeared worldwide and in many languages during the twentieth century. Before 1900 few instructions on etching and engraving were published in Scandinavia, Spain, Portugal, Italy and eastern Europe, while in contrast they were available in abundance in England and Germany. The northern Netherlands take a middle position with thirty published instructions for the etcher from Ter Brugghen's text of 1616 up to 1900, varying from the odd recipe to monograph manuals.[9] France relied on Bosse and little else of its kind was published until the nineteenth century with the exception of items in encyclopaedias, which mostly refer back to Bosse's treatise. Technical information on intaglio printmaking started to appear in European journals and magazines in the course of the eighteenth century, and flourished after 1800. American journals republished these articles.[10]

New manuals

New techniques, such as colour intaglio printing, roulette engraving, aquatint and crayon etching appeared from the middle of the eighteenth century. They stimulated the publication of new manuals and were described in reference works.[11] Swiss engraver Johann Schellenberg was exceptional in this period, being the first (1795) to write about both etching and intaglio printing from personal experience.[12] All earlier publications about plate printing were 'second hand'. Their authors were either engravers such as Bosse who did not print themselves, or bibliographers who copied a text or summarised other persons' experiences.[13] Schellenberg's manual is indicative of the fact that the sharp distinction between engravers and plate printers was blurring in favour of the all-round printmaker himself designing and etching as well as printing again.

At the same time there was a growing openness due to societies that stimulated the arts, economy, agriculture, trade and science, such as the English Society for the Encouragement of Arts, Manufactures and Commerce and the Hollandsche Maatschappij der Wetenschappen. They promoted competitions in all fields, awarded medals and money, and – most important for the dissemination of new ideas – published results.[14] Similarly, inventions could be patented, and texts and illustrations of patents were published in the nineteenth century. Many journals followed in their wake, copying, translating and summarising all that was new, sometimes after only a few months and sometimes as much as 20 years later.

The last translation of Bosse's treatise (Lisbon 1801) marked the end of an era. Stimulated by the abolition of the guild system on the European continent and the spread of the industrial revolution, a new concept of printmaking grew accompanied by a new type of manuals. When Friedrich Netto published his first treatise on etching in 1815 he still relied on Bosse's work.[15] The new handbook he published 25 years later was completely up to date and explained state-of-the art intaglio printmaking processes.[16] From our viewpoint it is a good example of the more scholarly approach of these new manuals that discussed the latest materials, techniques and machines.

Frenchman Aristide-Michel Perrot gave an overview (1830) of all etching and engraving techniques known and used.[17] His book was immediately picked up by Theodor Thon, a German scientist who etched as a hobby. Thon was not happy with Perrot's text, its author not being a practising etcher, and went into detail to edit and improve it for a revised German translation a year later.[18] Perrot's book is indeed a literature study, being published as part of the *Encyclopédie Roret*, a series of manuals on all kinds of arts and crafts. Following the concept, later versions of Perrot's text were updated to inform the public about the contemporary state of technical developments. The publication on plate printing by Berthiaud (1837) similarly was a report on the state of professional intaglio printing as performed in London and Paris rather than a practical manual.[19] In contrast to Perrot, Berthiaud visited printshops in both cities to gather first-hand information.

Parallel to this, from the first half of the century, journal articles were published for the professional engraver discussing new grounds and acids, steel plates and presses. The presentation of the daguerreotype process in 1839 greatly stimulated developments until all the above blended into the emerging printing trade with its photomechanical techniques and mechanisation of printing from the 1860s.[20]

Maxime Lalanne

Plate printing again is a good guide to the changes of attitude that prevailed concerning the involvement of the engraver in printing. References to the fact that amateurs or professional artists can have impressions of their plates pulled at a printer's – instead of printing their own plates themselves – reflect the common practice in Paris up to the 1860s and Charles Jaque gives an illustrated description of professional intaglio printing in the *Magasin pittoresque* (1852).[21] But ideas in England had already changed and the growing interest in manual techniques stimulated the idea that the etcher should also print his own plates.[22] By 1866, Philip Hamerton had designed a small, portable etching press from the idea that 'every etcher ought to print his own proofs'; this machine became available in 1870.[23]

The tone was set and from now on manuals on etching also paid due attention to the printing of the plates. Although the new attitude to printmaking was propagated by the Société des Aqua-fortistes, French etchers were somewhat slower to also start printing their own plates. In the chapter on plate printing in Maxime Lalanne's manual, the reader is guided around the workshop of the printer Auguste Delâtre, instead of Lalanne himself giving advice on how to print.[24] Nevertheless, the technical details are there and in later editions illustrations of and recommendations for roller presses are inserted.[25] The manual proved a great success with eight editions from 1866 to 1924, six English translations and three bilingual French–English editions, plus two modern facsimiles (Box 2).

Stanley Hayter

Józef Hecht and Stanley Hayter established a printmaking studio in Paris in 1927 called Atelier 17 from 1933, and during the Second World War until his return to Paris in 1950 Hayter ran similar workshops in New York.[26] These studios attracted many daring young printmakers, both men and women, who in their turn set up studios according to the model of Atelier 17.[27] Of even greater importance was the impact of their publications. Hecht worked on compiling a handbook for engravers, which never reached beyond the stage of a series of notes, but his ideas found their way to the concept of the Atelier 17. Incorporating those ideas, Hayter published a manual on intaglio printmaking that set a completely new tone in post-war printmaking and influenced generations of artists.[28] Similarly, the manual became an archetype for manuals produced by his students and the students of their students, as shown by the pedigree of Hayter's handbook (Box 3). To him, plate printing was an essential part of printmaking: Hayter instructs plate printing in detail and explains various manners of colour printing in his manual. Of special note is the process of 'viscosity colour printing', invented by him in his New York studio in 1944 and refined by his student Krishna Reddy.[29]

Working Manner

The following compilation of title descriptions is a technical-historical bibliography of practical handbooks, articles and manuscripts on manual intaglio printmaking processes up to and including the year 2010.[30] The purpose of this bibliography is to identify every text and its content in order to place the text in its historical and technical context. Studying the contents of these manuals aims at tracing technical developments in manual intaglio printmaking from the sixteenth century until today.

Definitions and criteria

This is neither a book-historical nor an analytical bibliography, which means that only limited collations are given. For example, 'u' and 'v' are spelled as they are read, and words in capitals, small caps, bold type, italics, of different fonts, different font sizes, or colour printed, are transcribed only as plain text. For the rest the spelling is transcribed as given, including diacritical marks, and deviations in spelling and typesetting. This suffices to clarify the differences and correspondences between texts, and to identify the individual edition, issue or copy of a text.

The title descriptions are compiled according to the rules of the International Standard Bibliographic Description (ISBD), slightly adapted to the needs of the subject and the present book. The collation is in the language of the text, but inserted notes are in English. For example, the number of abbreviations in the title descriptions themselves is limited in order to increase readability, English translations are given of all non-English titles and further annotations added where necessary. Information is given about bookbinding, printing and paper in order to distinguish between editions, different issues of the same edition, or single copies. The height of a book is given per half centimetre; with oblong books height is given before width. The authorised keywords cover the complete content of a text with emphasis on intaglio printmaking techniques.[31]

The Bibliography of Practical Manuals is exhaustive, covering all monographs on manual intaglio printmaking printed in the Latin alphabet and published from 1555 to 2010. Most of these publications concern intaglio printmaking techniques only; others are concerned with printmaking in general with a section on intaglio techniques. I am aware of manuals on intaglio printmaking published in scripts other than the Latin alphabet, but I am not proficient enough in those scripts to be able to judge the contents of the publications properly in order to select them for the bibliography.

Inserted in between the printed monographs are manuscript texts on intaglio printmaking techniques. Their number is but a mere gathering of what I came across by chance, because any tools for carrying out a more systematic search largely failed. The manuscripts on intaglio printmaking techniques might seem a rather random lot but they

represent a precedent – they are never systematically mentioned in any of the bibliographies and literature lists studied. Written prescriptions and recipes on engraving, etching and printing are only rarely catalogued by libraries. The material found can be divided as follows: manuscript notes in printed books; incidental notes in manuscripts concerning various topics; loose notes; whole or partial manuscript copies of printed books; and original monograph volumes. Some in the last category are published as monographs posthumously.[32]

The number of articles is limited mainly to publications in eighteenth- and nineteenth-century periodicals, with a selection of articles from a few twentieth-century journals. The limited number is due to the greater difficulties in tracing articles. Today title descriptions of most published monographs are retrievable in online bibliographical databases, while retrieving historical articles still means perusing volume after volume of journals and magazines. Nevertheless, the number of article entries in the bibliography represents a good coverage of the developments and highlights of intaglio printmaking in this period.

Search methods

The Bibliography of Practical Manuals is not the first of its kind and bases itself on earlier bibliographies on printing and printmaking, which are referred to with the individual title descriptions.[33] Literature lists of monographs on prints and printmaking were checked for suitable titles. General bibliographies, bibliographical databases, union catalogues and library catalogues were searched using multilingual keywords, title words, authors' names and classification codes. Auction catalogues and catalogues of (antiquarian) book dealers are spelled and book dealers often asked for further details. Many public and private libraries were visited in order to describe objects by autopsy.[34] All this work was enriched by browsing, serendipity and the support of many who drew my attention to particular titles.

Many titles nowadays can be retrieved online through PiCarta for Netherlands library collections, the European Library for collections in national European libraries, and the Karlsruhe Virtual Catalogue for library collections worldwide.[35] Autopsy of the originals remains necessary, however, because title descriptions in catalogues are rarely specific enough, contain errors and 'ghosts', and disclosure is only general. Another reason is that there is no public library with sufficient coverage of the subject to serve as a reference collection on intaglio printmaking techniques. Seeing more copies of the same publication confirms the details of one edition. Autopsy serves to identify between editions, between different issues of the same edition and between varieties of the same issue. It shows the difference between hard- and soft-cover editions of the same text, and whether two texts are really different or whether they are different title descriptions of the same text; the study of bookbinding and paper has already been mentioned. Sometimes what seems a printed publication turns out to be a manuscript, or it concerns a text whose title circulates in bibliographies, but which actually was never published and therefore is called a 'ghost'.

Inevitably one reaches physical limits in this process. Not every collection can be visited in order to see copies of titles that were found through literature research. To compensate for this, books were ordered through (international) interlibrary loan. Copies of any kind were ordered in case books could not be sent. They are good enough for describing the content of a text, but are lacking when it comes to proper bibliographical research. Occasionally, for example, the difference between two apparently similar copies of one edition of a book is in the kind of paper used.

Today many libraries present their catalogues through online databases, which is certainly helpful in tracing publications of which a title or author is known. Sadly, however, the detailed classification systems and subject catalogues common in the former card catalogues are usually not entered, let alone continued, in digital systems. This is a serious drawback for searching per subject. As long as no detailed content search is possible the painstakingly compiled bibliography, the exhaustive list of titles on a particular subject, will still remain a necessity for every specialist in his field, as the quote by Juan Carrete Parrondo above expresses. A bibliography is the basis for any serious study and it will be a long time before any automated system can compete with it.

Attempts were made to collate at least one copy of every manual and nearly all first editions of every text described were seen. Alternatively microfiches, microfilms, photocopies, photos, slides and digital scans were used in the compilation of title descriptions.[36] A number of details concerning other editions were derived from title descriptions in library catalogues and since in general texts are not changed much in following editions (Bosse's text being the exception), this information usually is supportive enough to distinguish between editions.

To see so many texts supports research of the text itself and of its contents, as well as allowing comparison between texts. This in its turn provides ideas concerning the beginning, development, use and decline of a particular technology.

Instructive manuals do not cover the complete history of the technology of intaglio printmaking, however. Publications of a descriptive character that are excluded from the bibliography may contain details missing in the practical handbooks. Where appropriate they are therefore referred to in the present book and their titles can be found in the Literature section (p. 605). Note that occasionally descriptive publications are entered in the bibliography, which is

annotated.[37] The bibliography is compiled in such a way that researchers should be able to make well-argued decisions about information concerning their own projects.[38] For the rest, I humbly paraphrase Bridson and Wakeman (1984: 10): may my readers forgive my errors, notify me of my omissions and look charitably on this attempt to describe some of the bibliographical byways of printmaking and picture-printing history.

Keywords

The following authorised terms are used for describing the content of any text in the Bibliography of Practical Manuals. Authorised terms are defined briefly, and related colloquial terms ('Related terms') as well as other authorised terms ('See also') are given. The combination of keywords explains the content of the text. For example, the term 'steel engraving' is not found here, but the combination of 'Line etching' and 'Steel' makes clear that steel engraving is discussed. Further details are listed in the annotation to the title description if necessary.

The keywords are divided in five groups:

1
Engraving and etching techniques: concerns the making of the intaglio printing plate.
2
Plate materials: concerns the materials for the intaglio printing plate.
3
Intaglio printing materials and techniques: concerns the materials, machines and techniques related to the printing of the intaglio plate.
4
Other art-making and printmaking processes: concerns any art or craft techniques other than intaglio printmaking processes, with an emphasis on other printmaking techniques.
5
Related subjects: other topics related to intaglio printmaking.

Note that keywords do not indicate how much of the text concerns the subject or the extent of the information it contains.

1. Engraving and etching techniques
Aquatint: tonal effects are created by means of special grounds, such as resin powder melted onto the plate, by the perforation of a normal etching ground, or by applying acid directly onto the metal.
Related terms: direct etching, dust-grain, liquid grain, open bite, salt grain, sand grain, spitbite, sugar grain, sulphur tint, transfer process.
See also: Lift-ground; Line Etching; Photo-mechanical Etching.

Carborundum Print: (1) a hard powder, such as carborundum, is mixed with a binding medium, the mixture is painted onto the plate and the plate printed in intaglio, comparable to collagraph; (2) a hard powder, such as carborundum, is used to roughen the surface of a printing plate, comparable to mezzotint.
Related terms: carborundum etching, carborundum mezzotint.
See also: Collagraph; Mezzotint.

Collagraph: materials are pasted, stuck, nailed or welded to a base plate, or a malleable layer is applied to the surface of the plate and textures created in it before it hardens; the surface is lacquered or steelfaced; the resulting plate is printed in intaglio or relief, or both at the same time.
Related terms: collograph, colograph, galvanogravure, galvanotype, Herkomertype, Herkotype, silkprint, spongotype.
See also: Carborundum Print.

Crayon Engraving: the design is created by locally roughening the plate with special tools, such as roulettes, or with hard powders in order to create crayon-like lines.
Related term: roulette engraving.
See also: Stipple Engraving.

Crayon Etching: the plate is covered with normal etching ground and the ground treated with special tools, such as multiple pointed etching needles, or hard powders; the plate is etched and shows crayon-like lines.

Related term: transfer process.
See also: Line Etching; Soft-ground; Stipple Engraving.

Drypoint: the design is scratched into the plate by means of a sharp needle.
See also: Line Engraving; Mezzotint.

Échoppe: a needle of round section with an obliquely cut tip is used to draw in the ground; swelling lines can be created by turning the needle during drawing.
See also: Line Etching.

Electrical Engraving: grooves are made by touching the metal plate with an electrically charged metal pen that removes material from the plate and forms a groove.

Electrolytic Etching: the plate is etched by means of electrolysis, ie in a bath with a salt solution by means of an electrical current.
Related terms: galvanic etching, galvanography.
See also: Electrotype; Line Etching; Steelfacing.

Electrotype: a copy of an original printing plate is made by means of galvanisation.
Related terms: electro-monotype, Herkomertype, spongotype.
See also: Collagraph; Electrolytic Etching; Steelfacing.

Lift-ground: a drawing is made on the plate with a water-soluble solution; this is left to dry, the whole is covered with etching ground, the plate submerged in water; the water dissolves the solution and takes away the ground on top of it; the metal lays bare where the ground is removed and the plate is etched.
Related terms: reservage, sugar aquatint, sugar lift.
See also: Aquatint; Line Etching.

Line Engraving: the design is cut in the plate by means of a burin.
Related terms: copper-engraving, engraving.
See also: Drypoint; Ruling Machine; Stipple Engraving.

Line Etching: the plate is covered with an acid-resistant ground, the design drawn into the ground, the metal lays bare where the ground is removed and the plate is etched.
Related terms: etching.
See also: Aquatint; Crayon Etching; Échoppe; Electrolytic Etching; Lift-ground; Photomechanical Etching; Relief Etching; Ruling Machine; Stipple Engraving.

Mezzotint: the surface of the plate is roughened with special tools, such as rockers, or with hard powders, the design is made by scraping off and polishing down the raised burr.
Related term: black art.
See also: Carborundum Print; Drypoint.

Photomechanical Etching: the design is etched into the plate by means of an intermediate photosensitive layer.
Related terms: helio-engraving, heliogravure, photogravure, polymer film, rotogravure, solarplate.
See also: Aquatint; Line Etching; Photomechanical Processes.

Pyrogravure: lines and dots are burnt into the plate with a hot metal point, usually heated by electricity; not to be confused with Electrical Engraving.

Relief Etching: the design is etched in the plate with the intention to print the plate in relief; can be combined with intaglio printing such as in viscosity colour printing.
Related term: *Ektypographie*.
See also: Line Etching.

Ruling Machine: (1) the plate is engraved by means of a machine, (2) the etching ground is ruled by means of a machine.
Related terms: anaglyptography, *guilloche*, lining machine work, mechanical engraving, mechanical etching.

See also: Line Engraving; Line Etching.

Soft-ground: the plate is covered with a mixture of normal etching ground with mutton fat, petroleum jelly (Vaseline) or similar to keep it soft and make it sticky; a sheet of paper is placed on top of the soft-ground layer, drawn upon and lifted again; the ground will stick to the paper where it is drawn upon and by lifting the paper ground is taken off the plate locally; by etching the plate, crayon-like lines appear; similarly marks may be made by pressing the textured surface of flat objects such as leaves or feathers into soft-ground.
Related term: *vernis mou*.
See also: Crayon Etching; Nature Printing.
Stipple Engraving: the design is etched and additionally engraved into the plate by means of series of dots and flicks.
Related term: dotted manner, dotting.
See also: Crayon Engraving; Crayon Etching; Line Engraving; Line Etching.

2. Plate materials
Aluminium: metal, element Al.

Bone: mammal bone.
See also: Ivory.

Brass: alloy of copper (Cu) and zinc (Zn).
Related term: latten.
See also: Copper.

Bronze: alloy of copper (Cu) and tin (Sn).
See also: Copper.

Cardboard: a paper product.
Related terms: Bristol board, *carton de Lyon*, *Eispapier*, *Glaspapier*, *Leimdeckel*, *Preßspan*.

Copper: metal, element Cu.
See also: Brass; Bronze.

Gelatin: extracted from the bones of mammals or the swim bladders of fish.
Related terms: fish glue, isinglass.

Glass: any kind of glass.

Gold: metal, element Au.

Iron: metal, element Fe.
Related terms: galvanised iron, tin plate, white iron.
See also: Steel.

Ivory: from the tusks of mammals.
See also: Bone.

Lead: metal, element Pb.

Linoleum: a mixture of cork, chalk and linseed oil.

Magnesium: metal, element Mg.

Photopolymer Film: plastic film coated with a light-sensitive polymer.
Related term: polymer film.
See also: Photopolymer Plate.

Photopolymer Plate: metal or plastic plate coated with a light-sensitive polymer.
Related term: solarplate.

See also: Photopolymer Film.

Plastic: artificial material based on carbon-hydrogen compounds.
Related terms: acrylic, celluloid, Perspex.
Porcelain: earthenware heated until glass-like.

Primed Canvas: canvas or linen primed with a mixture of chalk and linseed oil in order to serve as printing plate suited to work with a drypoint.

Silver: metal, element Ag.

Steel: metal, element Fe, with traces of other elements that improve the hardening process of iron.
See also: Iron.

Steelfacing: the plate is electrolytically covered with a thin layer of iron (steel), or other metal such as chrome, cobalt, copper or nickel, ie in a bath with a salt solution of either of these metals by means of an electrical current.
Related terms: chrome-facing, copper-facing, electro-monotype, galvanisation.
See also: Electrolytic Etching; Electrotype.

Stone: natural stone based on minerals; ceramic plate.

Tin: metal, element Sn.
Related term: pewter.

Type Metal: the metal alloy used in typography, usually a mixture of lead, tin and antimony, with possible further additions.

Wood: natural material based on carbon-hydrogen compounds, mainly lignin.
Related terms: Masonite, high-density board.

Zinc: metal, element Zn.
Related terms: messing, micro-metal, nickel-zinc, titanium-zinc.

3. Intaglio printing materials and techniques
Blind Embossment: the plate is printed without inking and the paper shows the relief of the plate.
Related term: blind embossing.

Casting: (1) the inked or uninked plate is pressed into clay, dough, paper clay or wax; (2) the inked or uninked plate is cast in fish glue, gelatin, gypsum, metal, paper pulp, plastic, rubber or sulphur; (3) the inked or uninked plate is vacuum formed using paper pulp or plastic.
Related term: printing without press.
See also: Rubbing.

Chine Collé: a sheet of thin usually Japanese paper is placed on the inked plate, this is covered with a sheet of thicker paper and the whole run through the press; the impression is made onto the thinner paper, which in the same run is stuck to the thicker backing paper.

Counterproof: a print is covered with a blank sheet of paper and the whole run through the press; the ink of a fresh print offsets onto the blank paper and thereby creates a reverse image of the original; older prints are covered with soap, the oil varnish in the ink saponifies and can be offset onto another surface.
Related terms: anastatic print, *contre épreuve*, offset printing.

Hand-colouring: the print is coloured by means of paint and brushes, with or without stencils.
Related term: illumination.

Ink: details of handling of printing ink and its constituents are given; various kinds of inks are discussed.

Jigsaw Print: the printing plate is cut into pieces, these are inked separately, fitted together again on the bed of the

press and the whole printed in one run.
Related terms: cut-out plate, cut-shape plate.
See also: Multiple-plate Printing; Printing Polychrome.

Leather: printing is performed on leather.
See also: Paper; Paper Clay; Parchment; Rubber; Textile.

Mechanised Intaglio Printing: intaglio printing is carried out by means of a mechanised press.

Multiple-plate Printing: several plates are printed after each other at the same place on the same sheet of paper; the inking may be black only or in different colours.
Related terms: multiplate printing, printing *au repérage*, printing in register.
See also: Jigsaw Print; Printing Polychrome.

Paper: details of the handling of paper for printing are given, usually various kinds of paper are discussed.
See also: Leather; Paper Clay; Parchment; Rubber; Textile.

Paper Clay: a mixture of clay with paper pulp.
See also: Leather; Paper; Parchment; Rubber; Textile.

Parchment: the matrix is printed on a sheet of parchment.
Related term: vellum.
See also: Leather; Paper; Paper clay; Rubber; Textile.

Press: the roller press, its construction and handling are discussed.
See also: Rubbing.

Print behind Glass: a print is stuck to a glass plate, the paper rubbed off with the inked image remaining and the glass painted on top of the ink.

Printing à la Poupée: one plate is inked with several colours at different places, wiped and printed in one run; the impression shows the different colours next to each other.
See also: Printing Polychrome.

Printing in Black: the plate is inked in black ink only.
See also: Printing Monochrome.

Printing Monochrome: the plate is inked in one colour only, except black.
See also: Printing in Black; Printing Polychrome.

Printing Polychrome: the impression is in more colours.
See also: Jigsaw Print; Multiple-plate Printing; Printing à la Poupée; Printing Monochrome; Viscosity Colour Printing.

Relief Printing: the surface of the intaglio plate is (partly) inked, and printed in relief.
Related terms: iris print, stencil printing.
See also: Viscosity Colour Printing.

Rubber: the matrix is printed on a sheet of rubber.
Related term: latex.
See also: Leather; Paper; Paper Clay; Parchment; Textile.

Rubbing: the plate is inked, covered with a sheet of paper and the impression is made by rubbing the back of the paper instead of using a press.
Related term: printing without press
See also: Casting; Press.

Textile: the matrix is printed on textile.

Related terms: cotton, satin, silk.
See also: Leather; Paper; Paper Clay; Parchment; Rubber.

Viscosity Colour Printing: the deeper parts of the plate are first inked in intaglio and the plate's surface wiped clean; the plate is then inked in relief with one or more layers of coloured ink of different viscosity, using harder and softer rollers; the plate is printed in one run and the impression shows the various colours on top of each other
Related terms: simultaneous colour printing, viscosity printing.
See also: Printing Polychrome; Relief Printing.

4. Other art-making, printing and printmaking processes
3D Print: print with a strong relief made by casting, pressing or vacuum forming, or otherwise shaped to a three-dimensional object with sculptural qualities.

Bookbinding: the binding of loose quires of written or printed sheets into a book.

Calligraphy: the art of writing beautifully.

Ceramics: objects made of fired clay.
Related terms: earthenware, porcelain, pottery.

Chiaroscuro Woodcut: several woodcut blocks are printed in colours over each other creating one image with a relief-like effect
See also: Woodcut.

Decalcomania: an image printed on a water-soluble substrate is offset on another surface.

Digital Printmaking: creating images by means of a computer, printed by a computer printer.

Drawing: creating images by means of crayon-like material or water-based ink, often combined with water-based paint.
Related term: perspective

Frottage: printing a relief by placing a sheet of paper on top of it and rubbing the back of the paper with a crayon.

Gem Cutting: the cutting of bone, gems, glass, ivory, or stones in order to decorate objects, not meant for intaglio printmaking.
Related terms: dactylioglyphy, intaglio technique, stone engraving.

Goldsmithing: working precious metals.

Gypsum Cut: form of relief printing using a block of gypsum as plate material.
See also: Line Block; Linocut; Typography; Woodcut; Wood Engraving.

Line Block: form of relief printing using a metal or plastic forme as plate material.
Related terms: metalcut, relief engraving.
See also: Gypsum Cut; Linocut; Typography; Woodcut; Wood Engraving.

Linocut: form of relief printing using linoleum or plastic as plate material.
See also: Gypsum Cut; Line block; Typography; Woodcut; Wood Engraving.

Lithography: here used as general term for creating images by means of a chemical action on stone or metal plate; the printing is a planographic process.
Related terms: offset printing, photocopy, planographic printing, waterless lithography.

Marbling: decorating a surface in patterns by means of colours and colouring.
Related terms: brocade paper, decorated paper.

Monotype: impression of an image, pattern or structure brushed on a smooth surface, such as a glass plate or polished

copper plate brushed with oil paint, not a prepared matrix.

Mosaic: image made with small pieces of coloured materials.

Multiples: multiplied objects.

Nature Printing: the natural object is inked, usually in relief, and printed.
Related term: *Naturselbstdruck*.
See also: Soft-ground.

Painting: creating images using paint and brush.

Photography: creating images by means of photosensitive chemicals.
Related terms: *cliché verre*, daguerreotype, photochemigraphy, verrography.

Photomechanical Processes: all other photomechanical processes except photomechanical etching.
See also: Photomechanical Etching.

Planographic Printing: the printing and non-printing parts of the matrix are at the same level.
This general term is not used here, see instead: Lithography.

Relief Printing: the non-printing parts of the matrix are lower and the raised parts are to be inked for printing.
Related terms: book printing, *chiaroscuro* printing, *cliché* printing, *criblé*, die cutting, *Ektypographie*, electrotyping, galvanography, metalcut, photoxylography, relief engraving, stereotyping.
This general term is not used here, see instead: Gypsum Cut; Line Block; Linocut; Relief Etching; Rubbing; Typography; Woodcut; Wood Engraving.

Sculpture: creating three-dimensional objects.
Related terms: relief, *sgrafitto*.

Screen Printing: here used as general term for creating images by means of inking a support through a stencil.
Related terms: *pochoir*, serigraphy, silkscreen, stencil printing.

Sgraffito: image made by scratching through layers of different colours.

Stamping: pressing a relief printing form by hand against a surface, such as a rubber stamp on paper.
Related term: die sinking.

Troubleshooting: possible causes for difficulties in platemaking and plate printing, and suggestions how to solve them.

Typography: letterpress printing.
Related term: stereotype.
See also: Gypsum Cut; Line Block; Linocut; Woodcut; Wood Engraving.

Woodcut: a form of relief printing using the grained side of wooden planks as plate material, which is cut with a knife.
See also: Chiaroscuro Woodcut; Gypsum Cut; Line Block; Linocut; Typography; Wood Engraving.

Wood Engraving: form of relief printing using end grain woodblocks as plate material, which is engraved with a burin.
Related term: photoxylography.
See also: Gypsum Cut; Line Block; Linocut; Typography; Woodcut.

5. Related subjects
Aesthetics: discussion on the appearance of the print.

Art Dealing: the dealing or trading in artworks, more in particular prints.
Related term: print dealing.

Art History: introduction to print history.

Collecting: the collecting of artworks, in particular prints.
Related term: bibliophily.

Conservation and Restoration: taking care of prints, usually concerns the mounting of prints.
Related terms: cleaning, framing, matting, mounting, restoring.

Health and Safety: health and safety aspects in relation to printmaking.
Related terms: non-toxic techniques, safer procedures.

Original and Reproduction: discussion on the originality of the print.

Abbreviations

Formal terms

[ ] = inserted note, information taken from another source
… = lacking information
? = unclear or uncertain information
sic! = literal
§ = follows annotation
3× = three copies, etc.
Addenda and corrigenda = list of numbers, terms or phrases that are missing or are mistaken and need to be added, corrected or changed
Aufl. (Auflage) = edition
augm. (augmentée) = augmented
Ausg. (Ausgabe) = publication
b/w = black and white
bd. = binding
bifol. = bifolium
c. = circa
cf. = confirm
cm = centimetre
col. = column
comp. = compiled, compiler
coop. = cooperation, cooperator
coord. = coordination, coordinator
cop. = copyright
corr. (corrigée) = corrected
diagr. = diagram(s)
del. (delineat, delineavit) = has drawn
ed. (edición, édition, edizione) = edited, editing, edition, editor
engr. = engraving(s)
engr. titlep. = engraved or etched title page
enl. = enlarged
et al. (et alii) = and others with the same function
etch. = etching(s)
exp. = expanded
fig., Fig. (figura(s), Figur(en), figu(u)r(en)) = figure(s)
fol. (folium, folia) = sheet(s)
front. = frontispiece
hrsg. (herausgegeben) = edited
Hrsg. (Herausgeber) = editor

ill. = illustration, illustrator

In: = the periodical the article is part of; references to and location of copies

inc. = incomplete

introd. = introduction

inv. (invenit) = has designed

lit. = literature

MIP = manual intaglio printmaking, the part of the treatise discussing manual intaglio printmaking processes, if not given the treatise deals with manual intaglio printmaking techniques only

ms. = manuscript

mss. = manuscripts

NOT FOUND = the title is mentioned in literature, but no copy is found in reference works or library collections

NOT PUBLISHED = the title is mentioned in literature, but was never actually published

NOT SEEN = no copy is seen, the description is based on title descriptions in reference works and library catalogues

no. = number

nos. = numbers

n. = note

OCR repr. = Optical Character Recognition reprint, reprint made by scanning the original and transposing the text by means of OCR without manual editing

opp. = opposite

p. = page

pp. = pages

pl. (planche(s), pla(a)t(en)) = plate(s)

photogr. (photographie) = photograph(s)

photom. repr. = photomechanical reprint

pt. = part

pts. = parts

repr. = reprint(ed)

reprod. = reproduction(s)

republ. = republication

rev. (revue) = revised

sc. (sculpsit) = has engraved

s.a. (sine anno) = without year

s.l. (sine loco) = without place

s.n. (sine nomine) = without the name of a publisher

stocklist = list of book or prints the book dealer or publisher had in stock, or publisher's catalogue

suppl. = supplement

t. (tome) = volume

tab. = table

titlep. = title page

titlepl. = title plate

transl. = translator, translation

URLs = list of websites

vign. = vignette(s)

vol. = volume

with literature = references spread throughout the text or in notes

Public collections

ABE = Academia delle Belle Arte, Venice

ABK = Akademie der Bildenden Künste, München

AHM = Amsterdams Historisch Museum, Amsterdam

AN = Archives Nationales, Paris

ATH = Atheneum- of Stadsbibliotheek, Deventer

BA = Bibliothèque de l'Arsenal, Paris

BAA = Bibliotèque d'Art et de l'Archeologie, Paris

BAV = Biblioteca Apostolica Vaticana, Rome

BCB = Biblioteca de Catalunya, Barcelona

BCP = Bibliotheca Civica, Padua
BLO = Bodleian Library, Oxford
BM = British Museum, London
BMa = Biblioteca Nazionale Marciana, Venezia
BN = Bibliothèque Nationale, Paris
BNCF = Biblioteca Nazionale Centrale, Firenze
BNL = Biblioteca Nacional, Lisbon
BNM = Biblioteca Nacional, Madrid
BNW = Biblioteka Narodowa, Warszawa
BUC = Biblioteca Universitaria di Cagliari, Cagliari
CBA = Civica Biblioteca Ariostea, Ferrara
CCI = Canadian Conservation Institute, Ottawa
CRL = Central Reference Library, Liverpool
DBSM = Deutsches Buch- und Schriftmuseum, Leipzig
DD = Duke of Devonshire, Chatsworth House, Derbyshire
DNB-F = Deutsche Nationalbibliothek, Frankfurt am Main
DNB-L = Deutsche Nationalbibliothek, Leipzig
EHB = Economische Historische bibliotheek, Amsterdam
ENS = library of the firm of Enschedé, Haarlem
FC-CFL = Fondation Custodia, Collection Frits Lugt, Paris
FCG = Fundação Calouste Gulbenkian, Lisboa
FHK = Fachhochschule, Köln
GAA = Gemeentearchief, Amsterdam
GAH = Gemeentearchief, Haarlem
GAL = Gemeentearchief, Leyden
GAM = Gemeentearchief, Maastricht
GAR = Gemeentelijke Archiefdienst, Rotterdam
GAU = Gemeentearchief, Utrecht
GBR = Gemeentelijke Bibliotheek, Rotterdam
GLA = Grafisch Lyceum Amsterdam, Amsterdam
GLVA = Graphische Lehr- und Versuch-Anstalt, Vienna (part of the Albertina)
GMM = Gutenberg Museum, Mainz
GMPL = Gemeentelijk Museum het Princessehof, Leeuwarden
HAB = Herzog August Bibliothek, Wolfenbüttel
HAUM = Herzog Anton Ulrich-Museum, Braunschweig
HGKB = Hochschule für Graphische Kunst und Buchgewerbe, Leipzig
ICL = Imperial College, London
KB = Koninklijke Bibliotheek, Den Haag
KBK = Kongelige Bibliotek, Kjøbenhavn
KBR = Koninklijke Bibliotheek / Bibliothèque Royale Albert I, Brussel
KBS = Kungelige Biblioteket, Stockholm
KCA = Kanazawa College of Art, Kanazawa
KSM = Kunstbibliothek der Staatlichen Museen, Berlin
KVB = Koninkijke Vereeniging ter Bevordering van de Belangen des Boekhandels, Amsterdam
KVK = Karlsruher Virtueller Katalog, Karlsruhe; http://www.ubka.uni-karlsruhe.de/kvk.html
LAS = Library of the Academy of Sciences, St. Petersburg, Russia
LINDA = Union Catalogue of Finnish University Libraries; http://linda.linneanet.fi/
MBKL = Museum für Bildende Kunst, Leipzig
MBvB = Museum Boijmans Van Beuningen, Rotterdam
MDEO = Musée du Dessin et de l'Estampe Originale, Gravelines.
MFA = Museum of Fine Arts, Boston.
ML = Musée du Louvre, Paris
MLU = Martin-Luther-Universität, Halle
MMAT = National Museum of Modern Art, Tokyo
MMGA = Machida City Museum of Graphic Art, Tokyo
MMR = Maritiem Museum, Rotterdam
MMW = Museum Meermanno-Westreenianum, Den Haag
MNAC = Museu Nacional d'Art de Cataluña, Barcelona

MNW = Muzeum Narodowe w Warszawie, Contemporary Graphic Art Department
MPM = Museum Plantijn Moretus / Stedelijk Prentenkabinet, Antwerp
MSE = Museum Schotel, Esbeek
MVvG = Museum Vincent van Gogh, Amsterdam
NBLC = Nederlands Bibliotheek- en Lectuur-Centrum, Almere
NG = National Gallery, London
NGMA = National Gallery of Modern Art, New Delhi.
NGZK = Nederlands Goud-, Zilver- en Klokkenmuseum, Schoonhoven
NKC = National Library of Czechia, Prague
NLA = National Library of Australia, Canberra
NLC = Newberry Library, Chicago
NLS = National Library of Scotland, Edinburgh
NSUG = Niedersächsische Staats- und Universitätsbibliothek, Göttingen
NYPL = New York Public Library, New York
OBA = Openbare Bibliotheek, Amsterdam
PBL = Provinciale Bibliotheek Friesland, Leeuwarden
PBM = Provinciale Bibliotheek Zeeland, Middelburg
PUL = Princeton University Library, Princeton
RAA = Rijksacademie, Amsterdam
RAL = Royal Academy, London
RAM = Rijksacademie, Maastricht
RCE = Rijksdienst Cultureel Erfgoed, Amsterdam
RHM = Rembrandthuis Museum, Amsterdam
RISD = Rhode Island School of Design, Rhode Island
RKD = Rijksbureau voor Kunsthistorische Documentatie, Den Haag
RMA = Rijksmuseum, Amsterdam
RSL = Russian State Library, Moscow
SAH = Stadtarchiv, Heidelberg
SBA = Stadsbibliotheek, Antwerp
SBB = Staatsbibliothek, Berlin
SBBa = Staatsbibliothek, Bamberg
SK-GA = Städtische Kunstsammlungen, Galerie Albstadt, Albstadt (Ebingen)
SKI = Städelsches Kunst-Institut, Frankfurt am Main
SLSU = Sächsische Landesbibliothek – Staats- und Universitätsbibliothek, Dresden
SMA = Scheepvaartmuseum, Amsterdam
TIB = Technische Informationsbibliothek, Hannover
TM = Teylers Museum, Haarlem
TUB = Technische Universität, Braunschweig
TUD = Technische Universiteit, Delft
TUE = Technische Universiteit, Eindhoven
TUT = Technische Universiteit Twente, Enschede
UAL = University of Alabama Library, Tuscaloosa
UBA = Universiteitsbibliotheek, Amsterdam
UBAB = Universitätsbibliothek der Akademie der bildenden Künste, Vienna
UBB = Universitätsbibliothek, Bern
UBF = Universitätsbibliothek Freiburg in Breisgau
UBG = Universiteitsbibliotheek, Groningen
UBH = Universitätsbibliothek, Heidelberg
UBL = Universiteitsbibliotheek, Leiden
UBL-Boerhaave = Universiteitsbibliotheek, Leiden, Museum Boerhaave
UBL-KHI = Universiteitsbibliotheek, Leiden, Kunsthistorisch Instituut
UBLv = Universiteitsbibliotheek, Leuven
UBLz = Universitätsbibliothek, Leipzig
UBM = Universiteitsbibliotheek, Maastricht
UBN = Universiteitsbibliotheek, Nijmegen
UBU = Universiteitsbibliotheek, Utrecht
UBR = Universiteitsbibliotheek, Rotterdam
UBT = Universiteitsbibliotheek, Tilburg

UJK = Uniwersytet Jagielloński, Biblioteka Jagiellońska, Kraków
UKB = Univerzitná Knižnica, Bratislava
ULC = University Library, Cambridge
ULG = University Library, Glasgow
ULH = Universitäts- und Landesbibliothek, Halle/S
UM = University of Manchester, Manchester
V&A = Victoria & Albert Museum, London
VU = Vrije Universiteit, Amsterdam
WC = Windsor Castle, Windsor
WLL = Wellcome Library, London
WLS = Württembergische Landesbibliothek, Stuttgart
YU-BL = Yale University, Beinecke Library, New Haven
YU-YCBA = Yale University, Yale Center for British Art, New Haven
ZBZ = Zentralbibliothek, Zürich

Private collections

Private collections are indicated by Priv.Coll.

Published and online catalogues

BAI–1901 = *Bibliography of American imprints to 1901, compiled from the databases of the American Antiquarian Society and The Research Libraries Group, Inc*., 92 vols, New York [etc.]: Saur, 1993,

BCIN = Bibliographic Database of the Conservation Information Network; http://www.bcin.ca/English/home_english.html.

BIBSYS = Norway information system and union catalogue; http://www.bibsys.no/english/pages/index.php.

BL = British Library, London; http://catalogue.bl.uk/.

BLBS = British Library document supply, Boston Spa: general catalogue up to 1975, CD-ROM.

BNB50 = British National Bibliography 1950–1976, CD-ROM.

BNB77 = British National Bibliography 1977–1985, CD-ROM.

BNB86 = British National Bibliography 1986–..., CD-ROM.

BNF = Bibliographie Nationale Française, CD-ROM, from 1975.

BS = Bayerische Staatsbibliothek, München, URL: http://www.bsb-muenchen.de/OPACplus.92.0.html.

BS = *Bayerische Staatsbibliothek alphabetischer Katalog 1501–1840*, Vorausgabe, 60 vols. München [etc.]: Saur, 1987–1990.

CCB = Centrale Catalogus Boeken, Card Catalogue of the Koninklijke Bibliotheek, The Hague.

CCB 1/2 & 2/2 = Collectieve Catalogus België, 2 CD-ROMs.

COPAC = National, Academic, and Specialist Library Catalogue, UK; http://copac.ac.uk/search.

DBI-VK = Deutsches Bibliothek Institut: Verbund Katalog 1994, database, replaced by KVK (Germany), see above.

DNB = Deutsche National-Bibliographie, CD-ROM, from 1991.

ESTC = *The Eighteenth Century Short Title Catalogue*, microfiche ed. London: British Library, 1990.

GV = *Gesamtverzeichnis des deutschsprachigen Schrifttums 1700–1910*, 160 vols. + 1 vol. München [etc.]: Saur, 1979–1987.

HELKA = Finnish Universities Catalogue; https://helka.linneanet.fi/webvoye.htm.

IBK 1978 = *Internationale Bibliographie der Kunstwissenschaft*, repr. of vols. 1 (1902)–15 (1917/1918). Nendeln, Liechtenstein: Kraus, 1978.

KVK = Karlsruher Virtueller Katalog; http://www.ubka.uni-karlsruhe.de/kvk/kvk/kvk_en.html.

LIBRIS = Swedish Union Catalogue; http://libris.kb.se/?language=en.

MAK = *Katalog der Bibliothek des k.k. Österreichischen Museums für Kunst und Industrie [nowadays the Museum für Angewandte Kunst in Vienna]*. Wien: K.k. Österreichischen Museum, 1883; in the library of the Albertina, 48430-B.

MET = *The Metropolitan Museum of Art, New York. Library Catalog*. Boston, Mass.: Hall, 1960.; with seven supplements up to 1970.

NCC = Nederlandse Centrale Catalogus, online catalogue,, see PiCarta below.

NSTC 1 = *Nineteenth century short title catalogue: series I phase I 1801–1815*, 6 vols. Newcastle-upon-Tyne: Avero,

1984–1986.

NSTC 2 = *Nineteenth century short title catalogue: series II phase I 1816–1870*, vols. 1–30 (O-Oxenham). Newcastle-upon-Tyne: Avero, 1986–1992.

NUC–1956 = *The national union catalog of pre-1956 imprints [in USA]*, 754 vols. London [etc.]: Mansell, 1968–1981.

NUC 1968–1972 = National union catalog ... 1968–1972, 119 vols. Ann Arbor, Mi.: Edwards, 1973.

NUC 1982 = National union catalog ... 1982, 21 vols. Washington, DC: Library of Congress, 1983.

NUC 1977–1986 = National union catalog ... 1977–1986: name authorities, microfiche ed.

NUC 1987–1992 = National union catalog ... 1977–1986: name authorities, microfiche ed.

NUC 1994 = National union catalog ... 1977–1986: name authorities, microfiche ed.

NYPL = Dictionary Catalog … New York Public Library, 800 vols. New York: New York Public Library, 1979.

OCLC = On-line College Libraries Catalogue [in USA and Europe], not publicly available, see: WorldCat. below.

ÖNB = *Katalog der Österreichisschen Nationalbibliothek, Wien: Druckschriften 1501–1929*, microfiche ed. Hildesheim: Olm, [s.a.]; used as STC for Czech, German and Slowakian publications.

PiCarta = http://picarta.pica.nl.access.authkb.kb.nl/.

Poole 1882 = W.F. Poole, *An index to periodical literature*, 3rd [cumulative] ed. Boston: Osgood; London: Trübner.

Poole 1892 = *Poole's index to periodical literature. The second supplement from January 1 1887 to January 1 1892*, W.I. Fletcher (ed.) London: Kegan, Paul, Trench, Trübner.

Poole 1897 = *Poole's index to periodical literature. Third supplement from January 1 1892 to December 31 1896*, W.I. Fletcher, F.O. Poole (eds.). London: Paul, Trench, Trübner.

SBF = *Catalogue of the technical reference library of works on printing and the allied arts*, Saint Bride Foundation (ed.). London: printed for the Governors, 1919.

VD 17 = Verzeichnis der im deutschen Sprachbereich erschienenen Drucke des 17. Jahrhunderts: http://gso.gbv.de/.

VLB = *Verzeichnis der Lieferbaren Bücher = German Books in Print*. [Various publishers].

WorldCat = http://www.worldcat.org/.

Reference works

Note: these are the major bibliographies of titles on intaglio printmaking. Title descriptions of other references can be found in the Literature section (p. 605).

Bigmore, E.C. & Wyman, C.W.H. (1880–1886) *A Bibliography of Printing*, 2 vols. London: Quaritch.

Blas Benito, J. (1994) *Bibliografía del arte gráfico: grabado, litografía, serigrafía, historia, técnicas, artistas*. Madrid: Real Academia de Bellas Artes de San Fernando, Calcografía Nacional.

Bridson, G.D.R. & Wakeman, G. (1984) *Printmaking & Picture Printing: A Bibliographical Guide to Artistic & Industrial Techniques in Britain 1750–1900.* Oxford: The Plough Press; Williamsburg: The Bookpress.

Levis, H.C. (1910) *A Bibliography of American Books Relating to Prints and the Art and History of Engraving (etc.)*. London: printed at The Chiswick Press.

Levis, H.C. (1912) *A Descriptive Bibliography of the most Important Books in the English Language Relating to the Art & History of Engraving and the Collecting of Prints.* London: Ellis. [Supplement and index 1913. Photomechanical repr. Mansfield Centre, CT: Martino Fine Books.]

Pollard, A.W. & Redgrave, G.R. (1976–1991) *A Short-title catalogue of Books Printed in England, Scotland, & Ireland and of English Books Printed Abroad 1475–1640*, 2nd ed., 3 vols. London: The Bibliographical Society.

Singer, H.W. & Strang, W. (1897) *Etching, Engraving and the Other Methods of Printing Pictures*. London: Kegan Paul, Trench, Trübner.

Wing, D. (1972–1988) *Short-title Catalogue of Books Printed in England, Scotland, Ireland, Wales, and British America and of English Books Printed in Other Countries 1641–1700*, 2nd ed., 3 vols. New York: Modern Language Association of America.

Bibliographical Descriptions

The Bibliography of Practical Manuals is divided into two main parts: 'Books and Manuscripts' and 'Articles'. 'Books and manuscripts' cover non-periodical printed publications and their various editions, as well as manuscripts and their various written and printed copies. 'Articles' encompass publications in periodicals and their editions. Manuals based

on earlier published articles are found under 'Books and Manuscripts'. Both parts are arranged in alphabetical order of the headings. Check also the indices following the bibliography (Appendix 5).

Title descriptions are presented according to the following format:

heading
formal title description
annotation
keywords
locations and reference works.

The **heading** is the surname of the first author or compiler of the text with his or her personal name(s) between round brackets. For anonymous publications a heading comprises the first word(s) of the title. A heading is given only once and is followed by title descriptions of all of the editions and issues of the text. Handwritten notes in publications are seen as manuscripts and are entered under the headings of the publications, directly under the title description of the edition of which a copy keeps these notes. If the same author is present with more than one monograph, then the heading is followed by a serial number. If the same author(s) is/are present with more than one article, then the personal name(s) of the author(s) is/are followed by the year of publication. If the same author is present with more than one article published in the same year, then the personal name(s) of the author is followed by the year of publication and a serial number.

The **formal title description** is based on ISBD rules with some adaptations, such as notes inserted in square brackets in English, and the height of a book is given as '--.0' or '--.5' cm. Added are the first page numbers of contents, index and stock list (publisher's list), the first page numbers of the pages where specimens, addresses of suppliers, plate printers or steelfacers can be found, and the first and last page numbers as well as the number of figures concerning manual intaglio printmaking (MIP) if the monograph is substantially about more than just intaglio printmaking. Descriptions of manuscripts and manuscript notes are kept to the minimum of what is needed for identification. For abbreviations see above.

The **annotation** follows after the § sign and contains a translation of the title if the publication is not in English. It gives further details and explanations concerning the formal title description of the object. The order of the topics treated follows the order of the elements of the formal title description. Occasional references to contents and particular topics are annotated if thought necessary, for example if the title is not clear enough or if a special process or material is discussed. Announcements and book reviews are entered in so far as found. For references see either 'Locations and reference works' at the end of the title description or the Literature section (p. 605).

The **keywords** following the numerals 1 to 5 cover the complete contents of the text using authorised terms; see the list with defined keywords and the polyglot above.

Locations and reference works follow after 'In:' at the end of the title description and refer to collections where copies were traced and seen, and in which databases and reference works I found the title. Collections that hold digital scans, digital text copies, photocopies, photographs, slides, microfilms, microfiches or any other kinds or secondary reproducing materials, with the exception of photomechanical reprints, are not referred to unless otherwise noted in the annotation. For abbreviations of locations see above.

Notes

1
Es sobradamente conocido que los repertorios bibliográficos sobre cualquier ciencia o tema son instrumentos fundamentales para el avance de las mismas. Debían haber pasado ya aquellos tiempos en los que una gran parte de la investigación era ocupada en la ardua tarea de reunir el material bibliográfico; *Blas Benito 1994*: 9.

2
For a discussion on art technological sources see: Introduction, p. 10.

3
Alessio Piemontese (Venetia 1555): 188–189.

4
Cellini (Fiorenza 1568).

5
Brugghen (Amsterdam 1616).

6
Böckler writes in the preface to his translation of **Bosse** (Nürnberg 1652): [9]: *Es ist, Günstiger Leser, nunmehr fast das dritte Jahr* [he writes in 1651]*, daß mir von einem guten Freunde und Liebhaber des Künsten, welcher sich dazumal in Holland auffgehalten [hat], ein kleines Tractätlein in Frantzöscher Sprach, handlend vom Etzen mit Scheidwasser in Kupffer, überschicket und verehret worden [ist]*. This means that Bosse's French treatise was known in Holland and Germany before 1650.

7
Fosie 1743: [8]–[12]; *Goeree 1974 (= 1697)*: 105–106; **Lairesse** (Amsterdam 1707): 377; **Le Blon** (Paris 1756): 82–83, 159; **Orlandi** (Napoli

1733); **Sandrart** (Nürnberg 1675) 1, book 2: 50; **Schwegman 1** (Haarlem 1793): 5–6; **Tempesti** (Firenze 1994)*:* 167. A copy of the 1645 edition was acquired by Duke August d.J. of Wolfenbüttel and perhaps used in the education of his sons, who made etchings; the volume is still in the Herzog August Library in Wolfenbüttel, shelfmark 28.14 Geom. A copy of the 1645 edition was in the library of Christiaan Huygens; *Catalogus 1695*: 12, no. 31. A copy of Bosse's treatise, probably the Dutch translation of 1662, was in the inventory of the engraver Cornelis Dusart; *Bredius 1915–1922*, 1: 52. Hendrik Hoogers's first etching (*Annette en Lubin*) was done only after studying Bosse: *Dit is mijne Eersteling, dank Bosse alleen, H. Hoogers fe. 1787*; *Kramm 1857–1864*, 1: 734. Dutch military officer Ernst Bagelaar went a step further. He not only taught himself etching and printing with the help of Bosse's treatise, but his own compilation of recipes on techniques for intaglio printing won an award and was published; **Bagelaer** (Haarlem 1818): 21–22; *Vermeeren 1962*.
8
Chamberlain (London 1972): 40; **Lumsden** (London 1925): 35–36; **Peterdi** (New York 1959): 83; **Sallberg** (Stockholm 1927): 11–12; **Verbruggen** (Amsterdam 1981): 174 no. A1.
9
Bagelaer (Haarlem 1817), **Bosse** (Amsterdam 1662), **Bylaert** (Leiden 1772), **Brugghen** (Amsterdam 1616, 1634, 1667), **Buonanni** (Leyden 1742, 1756), **Dake** (Amsterdam 1894), **Fokke 1** (Dordrecht 1796), **Fokke 2** (Den Hage 1803, Leyden 1804, 1805), **Lairesse** (Amsterdam 1707, 1712, 1714, 1716, 1733, 1740, 1836), **Pictorius** (Leyden 1747, Amsterdam 1770, 1775, 1780), **Roller** (Amsterdam 1889, various issues with this date), **Schwegman 1** (Haarlem 1793), **Schwegman 2** (Haarlem 1806), **Witgeest** (Amsterdam 1679). Not counted are the various editions of the Dutch translation of Alessio's book of recipes, starting with the first translation issued by Plantin in Antwerp in 1558; **Alessio** (Venetia 1555).
10
The Franklin Journal, 1 (1826) until present.
11
Bylaert (Leiden 1772) on crayon etching. **Fokke** (Dordrecht 1796) on aquatint etching and on crayon etching. **Le Blon** (Paris 1756) on multiple-plate colour printing. **Le Prince** (Paris 1788) on aquatint etching. **Stapart** (Paris 1773) on aquatint etching. **Tischbein** (Cassel 1790) on crayon etching. Information about roulette engraving as practised by Bonnet was published in **Bosse** (Paris 1758), from which can be concluded that the book was not published before 1769; *Hind 1907*.
12
Schellenberg (Winterthur 1795): 41–51. Apparently Schellenberg lived in a town where he, as an engraver, was free to print his own plates, or perhaps the guilds had already been abolished there.
13
Although Bosse describes plate printing and the construction of the press he was not a printer, *pas de ma profession*; **Bosse** (Paris 1645): 57. Robert Laurie, who described *à la poupée* printing mezzotints may have performed the printing himself, as English engravers more often than not printed their own plates; **Laurie** (1784). For manuscript notes by early etchers who printed their own plates see: **Borch** (Zwolle 1632); **Huygens-2** (Den Haag 1650); **Marciana manuscript** (S.l. 1501–1525).
14
Examples are: **Bagelaar** (Haarlem 1817); **Hassell 1** (London 1811); **Schwegman 1** (Haarlem 1793); **Schwegman 2** (Haarlem 1806).
15
Netto 1 (Dresden 1815).
16
Netto 2 (Quedlinburg 1840).
17
Perrot (Paris 1830).
18
Perrot (Ilmenau 1831).
19
Berthiaud (Paris 1837).
20
See Chapter 3, p. 228*.*
21
Bouton (Paris 1863?): 21; **Jaque** (1852): 256–257; **Potémont 1** (Paris 1864): pl. 4.
22
John Burnet, writing for amateurs in 1849, remarked: 'Those amateurs who reside in the country, or who may be desirous of keeping the impression in their own hands, can have a small copper-plate press in their own house'; **Burnet** (1849): 6.
23
Hamerton 1 (1866): 295; **Hamerton** (London 1871): 70–71. For further details see Chapter 2, p. 102.
24
Lalanne (Paris 1866): 83–94.
25
Lalanne (Paris 1878): 89 n. 1; **Lalanne** (London 1880): 70, and in all following English editions on this page.
26
See Chapter 2, p. 89. For a chronology of Hayter's activities in printmaking see: *Black & Moorhead 1992*: 391.
27
The studio still exists, but was renamed Contrepoint following Hayter's death in 1988, see above.
28
Hayter (London 1949). See also: Chapter 3, p. 221.
29
Hayter (London 1966): 121, 146-147, 150-160; **Reddy** (Albany 1988). Following some earlier experiments Hayter's first print in colour viscosity printing is *Centauresse* (1943 or 1944).
30

The exceptions are two later editions of **Bøegh**. For the differences between instructive and descriptive texts see: Introduction, p. 11.
31
For keywords see above, 'Keywords'.
32
Hecht (1994), see under **Hecht** (Lodz 1927–1931); **Holleman** (Utrecht 1927); **Hollenberg 1** (Ravensburg 1962); **Hollenberg 2** (München 2008); **Le Prince** (Paris 1780); **Schoonebeek** (2010) see under **Schoonebeek** (Amsterdam 1698); **Stauffer-Bern** (Dresden 1907); **Tempesti** (Fiorenze 1994); **Zonca** (Padoua 1607).
33
See: Introduction, p. 18.
34
For a list of visited libraries see above, 'Abbreviations'.
35
http://picarta.pica.nl/ (2010); http://search.theeuropeanlibrary.org/portal/en/index.html (2010); http://www.ubka.uni-karlsruhe.de/kvk.html (2010).
36
The copies received through the (international) interlibrary loan system did not always show which library held the original. In such cases only literature references are given.
37
Here the example of Singer & Strang is followed, who, in their bibliography on engraving and etching, stated that 'All of these books, with the exception of half a dozen perhaps, are addressed to the practical workman or artist'; *Singer & Strang 1897*: 188.
38
For example, the works in the bibliography contain a fair amount of information for a history of woodcut techniques.

Books and Manuscripts

References to the primary sources are in bold type with both place and date between brackets: **Seibold** (Eßlingen 1922). Reference commonly is to the first edition described under a heading: **Lalanne** (Paris 1866). If reference is to a specific edition, then place and year of this edition are given: **Lalanne** (London 1880).

   If more publications of the same author are described in this bibliography, then they are discerned by a serial number. When referred to, their mutual places and years of publication are given: **Gale 1** (London 2006), **Gale 2** (London 2009).

A

A.X.B.   001
Método de grabar al aguafuerte sobre cobre a imitación de la tinta china, conocido como grabado a la aquada / dispuesto por A.X.B. - Cádiz : […], 1823.
§ Title means: Method for engraving in copper with strong water in the imitation of Indian ink, known as watercolour graving [= aquatint]
No copy found or traced, but the title is seen by *Gallego Gallego 1979*: 277 n. 74, and **Pla** (Madrid 1956) [No. 241]: 8.
1 –
Aquatint
2 –
Copper
NOT FOUND
In: *Blas Benito 1994*: 67; *Figueras Ferrer 1992*: 1027.

Aagaard (Julius)   002
Raderekunstens teknik / af Julius Aagaard ; [pl. by F. Jacque]. - Kjøbenhavn : Truelsens ; [pl. printed by Carl Malthe], 1894. - 81 p. : 2 pl. ; 22.5 cm.
Specimens: pl. before text.
Contents: p. 5.
Supplier: p. 72.
§ Title means: Etching technique
Text based on the annual lecture of the Artists Society (*Kunstnerforeningen af 18. November*), given by Aagaard on 1 April 1894.
The preface is dated, p. 3: 'Frederiksberg, i Juli 1894'.
The two plates are two impressions of the same etching. The first impression is wiped clean, the other is printed with *retroussage* and plate tone and thus they are specimens of plate printing.
1 –
Aquatint / Drypoint / Electrolytic Etching / Line Etching
2 –
Copper / Steelfacing
3 –
Casting / Ink / Paper / Printing in Black

In: KBK; Priv.Coll.

Academia Italica, the publick school of drawing, or the gentlemans accomplishment / [introductory poem, 'Encomium' by R.Q.]; [introduction by T.P.]. - London : printed by Peter Lillicrap, and are to be sold by Robert Walton, 1666. - 2 vol. : ill. ; 27–32 cm.
§ Text based on several authors, p. [5]: 'as for our Authors they were master painters'; see annotation with vol. 2.
Dated in 'The second part', p. [6]: 'Licensed, April 4. 1666. Roger L'Estrange'.
Title description after photocopy of part 1 and microfilm of part 2.
– Vol. 1: Academia Italica, the publick school of drawing, or the gentlemans accomplishment. Being, the ingenious, pleasant and antient recreation of the noble, and the honour of arts, wherein you have plain examples and directions to guide you to the knowledge, first, of the noble and useful art of drawing, with a discourse of all the external parts of mans body, whereby it plainly appeareth how one part joyneth to another; by which means the judgement is well informed of every parts plyableness, and therefore the knowledge of the Anotomy [sic!] is of great concernment to this most admirable art. Secondly, the manner of washing or colouring maps and prints, with the names of the several colours proper for that purpose, and how they may be mixed, and what colours set off best together; as also how you should shadow things to cause them to shew more natural and beautiful. With instructions what you must do to paist maps or prints smooth on cloth or paper; and likewise what you must do to them to cause them to bear your colours and varnish. With divers rare secrets for making, ordering, and preserving of colours, the which was never fully and really discovered until now. The first part. - [6], 20 p. : [8] engr.
§ Intended audience, above pl. [1]: 'Academia italica. The first part of the Publick schoole of draw[ing] fit for young beginners. Rob: Walton'.
– Vol. 2: Academia italica. The publick school of drawing, or the gentlemans accomplishment. Wherin you have, first, more excellent examples and further instructions for your perfect attainment of that most noble and ingenuous art. Secondly, directions for painting, and the several colours used in that most excellent art. Thirdly, ample information for etching according to Mr. Bosse and Hollar. And lastly, because you should be every way compleatly fitted, here is also shewed the use of the graver, the which is necessary to help the defects which oft fall out in etching, and it is not onely more serviceable, but likewise sweeter and pleasanter. The second part. - [24] p. : [13] engr.
MIP: vol. 2, pp. 19 [= 18]–21 [= 22].
Stocklist: p. [23].
§ The paging is erratic, the verso sides of some plates are not paged. The collation of the unnumbered or mistakenly numbered pages is as follows: title page [= 1], p. ( ) [= 2], p. 5 [= p. 5], p. 4 [= p. 6], p. 8 [= p. 9], p. 19 [= 18], p. 19 [= 19], p. 20 [= 20], p. 21 [= 21], p. 02 [= 22], p. 21 [= 23], p. ( ) [= 24].
Structure and content about etching largely after **Browne 1** (London 1660) [No. 048]. The recipe for hard ground ('Mr. Bosse's Ground') and description of Line Engraving after Faithorne, see **Bosse** (London 1662) [No. 042.29]; cf. *Levis 1912*: 28. 'Mr. Hollers exact way of Etching' (pp. [21]–[22]) and 'Mr. Bosse's Ground' (p. [20]) are copied in **Book of drawing** (London 1675) [No. 040] and **Excellency** (London 1668) [No. 098]. Hollar's manner of working is probably copied in **English academy** (London 1672) [No. 091].
1 –
Line Engraving / Line Etching
2 –
Copper
3 –
Hand-colouring
4 –
Painting / Drawing
5 –
Art History
In: LC; *Levis 1912*: 27–28; NUC–1956; OCLC; V&A; *Wing 1972–1988*: no. 157A (2×).

Aqua tinta process / Robert Adam. - [London?], 02 December 1782. - [1] double fol. ; […] cm.
§ Manuscript.
Language: English.
Text sent to John Clerk of Eldin, see also: **Sandby 1** (London 1775) [No. 285].
Title description after transcription, see [No. 004.2].
1 –
Aquatint / Lift-ground
2 –
Copper
NOT SEEN
In: British Library, Patent Office Library, Woodcroft Collection.

Notes on early aquatint in England and France / Antony Griffiths.
In: Print quarterly. - Vol. 4 (1987), no. 3 (Sep.). - P. 255–273 : fig. 178–189.
MIP: p. 270.
§ Contains a transcription of the text about the dust-grain aquatint technique Adam sent to John Clerk of Eldin. Clerk had asked Paul Sandby about his aquatint process in 1775, the secret of which Sandby did not want to share, see: **Sandby 1** (London 1775) [No. 285]. Clerk had more success with Adam.
In: HAB; KB; Priv.Coll.; RMA; UBL-KHI.

Intaglio : acrylic-resist etching, collagraphy, engraving, drypoint, mezzotint, the complete safety-first system for creative printmaking / Robert Adam, Carol Robertson. - London : Thames & Hudson, 2007. - 240 p. : [229] ill., of which [30] in b/w ; 26 cm.
Contents: p. 5.
Suppliers: p. 230.
Glossary: p. 235.
Index: p. 238.

ISBN 0-500-51343-0 (hardcover)
ISBN 978-0-500-51343-0 (hardcover)
§ Announcement: *Printmaking Today*, 16 (2007), 2: 34.
1 –
Aquatint / Collagraph / Drypoint / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching
2 –
Copper / Photopolymer Film / Steel / Zinc
3 –
Blind embossment / Casting / Chine Collé / Paper / Printing in black
4 –
Monotype
5 –
Art History / Conservation and Restoration / Health and Safety
In: KVK; Priv.Coll.

Adeline (Louis Jules)   006.1

Les arts de reproduction vulgarisés / [Louis] Jules Adeline ; [pl. and ill. by Louis Jules Adeline]. - Paris : Libraries-Imprimeries Réunies, Ancienne Maison Quantin, [1894]. - [6], X, 379 p. : [12] pl. of which [2] in colour, 140 [= 137] vign. ; 26–27 cm.
List of publications by the same author: p. [2].
Literature: p. VI.
Contents: p. VII.
MIP: pp. 1–91, 275–301, 321–330, 339–344, 357–359.
List of pl.: p. 365.
List of ill.: p. 366.
Index: p. 371.
§ Title means: The manners of reproduction clarified
Although not a practical treatise the title is entered in the bibliography because the engraving and etching processes are described in detail; the parts on printing are more superficial.
Some of the plates are specimens of the various processes described.
Published with either a paper wrapper or a hard cover.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Hand-colouring / Multiple-plate Printing / Paper / Parchment / Printing à la Poupée / Printing in Black / Printing Polychrome / Rubbing
4 –
Lithography / Photomechanical Processes / Screen Printing / Woodcut / Wood Engraving
In: BL; BN; CCB; *Figueras Ferrer 1992*: 1027; MvC; NCC; NUC–1956; OBA; PBM; *Singer & Strang 1897*: no. 389; TM; TUD; UBA (2×); UBR; UBU.

006.2

La gravure à l'eau forte / de Jules Adeline. - Extrait. - Bruxelles : Destabel, [1980]. - [8], 91 p. : ill. ; 20.5 cm. - (Collection artisanat et loisirs).
Advertisement: p. [1].
Titles in the series: backside cover.
§ Title means: Engraving with acid
Photomechanical reprint of part of Paris [1894] [No. 006.1]: 1–91.
The illustrations are diagrams and reproductions.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Zinc
In: Priv.Coll.

Alamo (Maria Concepcion Saez de)
See: **Saez de Alamo** (Maria Concepcion) [No. 281].

Albert Durer revived
See: **Book of drawing** [No. 040.5].

Alessio Piemontese   007

Secreti del reverendo donno Alessio Piemontese. Nuovamente posti in luce. Opera utile, et necessaria universalmente à ciascuno . - In Venetia : per Sigismondo Bordogna, 1555. - [1–24], 25–229, [1] p. : [1] vign. ; 20 cm.
MIP: pp. 188–189.
§ Title means: Secrets of the reverend gentleman Alessio Piemontese. Newly put in light. Usefull works, and universally necessary to everyone
It has been suggested, but never confirmed, that Alessio Piemontese is a pseudonym of Girolamo Ruscelli. Johann Jacob Wecker translated the text in Latin.
Only the first edition of this very popular book of secrets is given. For a separate bibliography of the some 217 editions in Danish, Dutch, English, French, German, Latin and Polish of the *Secreti* by Alessio Piemontese see: *Stijnman 2012-2*.
3 –
Ink
In: BS; DBI-VK; NUC–1956; OCLC (3×).

The art & practice of etching; with directions for other methods of light and entertaining engraving / Henry [Thomas] Alken. - [1st ed.] - London : S. and J. Fuller, 1849. - 58, [6] p. : 9 pl. ; 18–19.5 cm.
Supplier: p. 10.
List of illustrations: p [1].
Advertisement for prints: p. [2].
§ Pl. 3 is the frontispiece.
The publisher is also the materials supplier.
The publication is aimed at amateurs; etching is presented as a form of amusement.
1 –
Aquatint / Drypoint / Line Etching / Soft-ground
2 –
Copper
5 –
Art History
In: BL; BLBS; *Bridson & Wakeman 1984*: no. B17; *Levis 1912*: 103; MET; NSTC 2; NUC–1956; OCLC (26×); Priv.Coll.; *Singer & Strang 1897*: no. 198.

008.2

The art & practice of etching; with directions for other methods of light and entertaining engraving / Henry [Thomas] Alken. - 2nd ed. - London : S. and J. Fuller [?], 1851.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B17.

Allen (Trevor)
See: **Russ** (Stephen) [No. 279].

Ristretto di ricordi per fare le vernici, ed altri secreti per incidere per uso / di Domenico Amici. - [Roma?], 1829. - [4] fol. ; 27.5 cm.
§ Title means: Summary of notes for making the varnishes, and other secrets for use with etching
Manuscript.
Language: Italian.
Contains recipes for etching grounds, mordant, walling wax and printing ink.
Title description after transcription, see [No. 009.2].
1 –
Line Etching
3 –
Ink
In: CBA.

009.2

L'Ottocento da riscoprire. Un ricettario per l'incisione di Domenico Amici / Antonio P. Torresi.
In: Kermes. - Vol. 5 (1992), no. 15 (Sep.–Dec.). - P. 35–40 : 3 fig. - (Le techniche).
MIP: pp. 38–39.
§ Contains a transcription of the above ms.
In: RCE.

Creative printmaking … for school and camp programs / Michael F[rank] Andrews. - Englewood Cliffs, NJ : Prentice-Hall, 1964. - XI, [3], 159 p. : [150] ill. ; 24.5 cm.
Contents: p. IX.
MIP: pp. 112–136 : [22] ill.
Glossary: p. 137.
Literature: p. 145.
Index: p. 149.
NOT SEEN
In: BL; *Blas Benito 1994*: 72; OCLC.

010.2

Creative printmaking … for school and camp programs / Michael F[rank] Andrews. - Second printing. - Englewood Cliffs, NJ : Prentice-Hall, 1964. - XI, [3], 159 p. : [c. 150] ill. ; 24.5 cm.
Contents: p. IX.
MIP: pp. 112–136 : [22] ill.
Glossary: p. 137.
Literature: p. 145.
Index: p. 149.
§ Printing dated, p. IV: 'Second printing August 1964'.
Intended audience, p. VI: 'The purpose of this book is to serve in a special way the needs of elementary, high school, and recreation art programs.'
1 –
Aquatint / Crayon Etching / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Aluminium / Brass / Copper / Plastic / Wood / Zinc
4 –

Linocut / Nature Printing / Photography / Lithography / Screen Printing / Stamping / Woodcut
In: OCLC; UA.

Antúnez (José Salvador)   011

La manera negra / José Salvador Antúnez Caracena. - Tarragona : Contratalla-Art, [2005]. - 86 p. : ill., partly in colour ; 24 cm. - (Colección Contratalla).
§ Title means: The black manner
1 –
Mezzotint
NOT SEEN
In: WorldCat.

Arcy Hughes (Ann)
See: **D'Arcy Hughes** (Ann) & **Vernon-Morris** (Hebe) [No. 071].

Art of drawing   012.1

The art of drawing in perspective: wherein the doctrine of perspective is clearly and concisely treated of, ... To which are annexed, the art of painting upon glass, and drawing in crayons; ... also the art of etching, and that of japanning ... to which is added a method of casting amber in any form whatever. - [1st ed.]. - London : printed for G. Keith and J. Robinson, 1755. - IV, 92 p. : [1] folding pl. ; 12º.
1 –
Line Etching
NOT SEEN
In: BL (2×); ESTC: no. t153183 (5×).

012.2

The art of drawing in perspective: wherin the doctrine of perspective is clearly and concisely treated of upon geometrical principles ... To which are annexed, the art of painting upon glass, and drawing in crayons: also the art of etching, and that of japanning upon wood or any metal so as to imitate China, with instructions for making black of gilt Japan ware ... and for making the hardest and most transparent varnishes and to which is added a method of casting amber in any form whatever. - The second ed. - London : for G. Keith, 1757. - IV, 92 p. : [1] folding pl. ; 17 cm.
MIP: pp. 55–70.
§ *Levis*: 'One folding plate containing 20 figures'.
NOT SEEN
In: BL; ESTC: no. t055592 (5×); *Levis 1912*: suppl. p. 11; NUC–1956; OCLC (2×).

012.3

The art of drawing in perspective: wherin the doctrine of perspective is clearly and concisely treated ... [etc.]. - The second ed., with considerable improvements. - London : printed for Robert Sayer, [1757?]. - [4], 31, [1] p. : [2] pl. ; 8º
§ *Spelman 2002*, cat. 47, annotation with no. 53 (the edition London 1786): 'it was possibly in that same year [1557] that Robert Sayer brought out what was announced as a second edition, but was in fact his own version of the earlier work. He reprinted the first part on perspective together with the folding plate, but then added a new section entitled "to put a street in perspective" which he illustrated with a double-page plate.'
NOT SEEN
In: ESTC: no. n016445.

012.4

The art of drawing in perspective ... [etc.]. - Dublin : printed by J. Potts, 1763. - IV, 92 p. : [1] folding pl. ; 17 cm.
NOT SEEN
In: NUC–1956; OCLC.

012.5

The art of drawing in perspective ... [etc.]. - London : […], 1763.
NOT SEEN
In: NUC–1956.

012.6

The art of drawing in perspective : wherein the doctrine of perspective is clearly and concisely treated of ... to which are annexed, the art of painting upon glass, and drawing in crayons with directions for making them after the French and Italian manner : also the art of etching, and that of japanning ... [etc.]. - A new ed., cor. - Dublin : printed by J. Potts, 1768. - [4], 92 p. : [1] folding pl. ; 17 cm.
– Added: The art of drawing, and painting in water-colors. - Dublin : Printed by J. Potts, 1768.
NOT SEEN
In: BL; ESTC: no. t056448 (5×); ULC.

012.7

The art of drawing, in perspective: wherein the doctrine of perspective is clearly and concisely treated of, upon geometrical principles; and a mechanical method of perspective and designing invented, for the benefit of such as are strangers to mathematics. To which are annexed, the art of painting upon glass, and drawing in crayons; with directions for making them after the French and Italian manner: also the art of etching, and that of japanning upon wood, or any metal, so as to imitate China; with instructions for making black or gilt Japan ware, both beautiful and light; and for making the hardest and most transparent varnishes; and, to which is added, a method of casting amber in any form whatever. - The third ed. - London : printed for G. Keith and J. Robinson, 1769. - IV, 92 p. : front., [1] folding pl. ; 17.5 cm.
Contents: p. III.
MIP: pp. 55–70.
§ The text is partly related to, but not copied from **Browne 2** (London 1669) [No. 049] and **Bosse** (London 1662) [No. 42.29]; with further details that are not in either of the two publications.
1 –
Échoppe / Line Etching
2 –
Copper

4 –
Perspective
5 –
Aesthetics
In: BL; ESTC: no. t055593 (3×); RMA.

The art of drawing, in perspective: wherein the doctrine of perspective is clearly and concisely treated of ... To which are annexed, the art of painting upon glass, and drawing in crayons ... the art of etching, and that of japanning upon wood ... to which is added, a method of casting amber in any form whatever. - The fourth ed. - London : for G. Keith, 1777. - iv, 92 p : [1] folding pl. ; 12º.
§ *Spelman*: 'engraved folding plate depicting 20 figures'.
NOT SEEN
In: BL; *Spelman 2002*, cat. 47: no. 47.

The art of drawing, in perspective ... [etc.]. - Dublin : […], 1777.
NOT SEEN
In: NUC–1956.

The art of drawing, in perspective ... [etc.]. - Dublin : […], 1786.
NOT SEEN
In: NUC–1956.

The art of drawing in perspective: wherin the doctrine of perspective is clearly and concisely treated of, upon geometrical principles; and a mechanical method of perspective and designing invented, for the benefit of those who are strangers ot mathematics ... [etc.]. - A new ed., with considerable improvements. - London : printed for and sold by Robert Sayer, 1786. - [4], 31, [1] p. : [1] engr. pl. with 20 fig., [1] double engr. pl. ; 12º.
NOT SEEN
In: NUC–1956.

The art of drawing, in perspective ... [etc.]. - The fifth ed. - London : printed for J. Johnson, 1791. - IV, 92 p. : pl. ; 12º.
NOT SEEN
In: ESTC: no. n043022; NUC–1956.

The art of drawing, in perspective ... [etc.]. - The sixth ed. - London : printed for J. Johnson, 1797. - IV, 92 p. : 1 pl. ; 12º.
NOT SEEN
In: BL; ESTC: no. t153184 (2×); NUC–1956; OCLC.

The art of drawing, in perspective : wherein the doctrine of perspective is clearly and concisely treated of, upon geometric principles / and a mechanical method of perspective and designing invented for ... those who are strangers to mathematics ... [etc.]. - Seventh ed. - London : Printed for Laurie and Whittle, (Successors to the late Mr. Robert Sayer), 1799. - [4], 32 p. : [3] pl. ; 18 cm.
NOT SEEN
In: ULC.

The art of drawing, in perspective ... [etc.]. - Eighth ed. - [London?]: […], [c. 1810?].
NOT SEEN

The art of drawing, in perspective ... [etc.]. - The ninth ed., with considerable improvements. - London : Whittle & Laurie, 1817. - 32 p. : 3 pl. ; 8º.
NOT SEEN
In: BL; NSTC 2: no. 2A16790.

The art of drawing, in perspective ... [etc.]. - The ninth [sic!] ed. - London : Whittle & Laurie, 1818.
NOT SEEN
In: BL; NSTC 2: no. 2A16790.

The art of drawing, in perspective ... [etc.]. - Tenth ed., with considerable improvements. - London : Laurie, 1825. - 34 p. : 3 pl. ; 12º.
NOT SEEN
In: BL; NSTC 2: no. 2A16790.

Art technological notes   **013**

[Art technological notes]. - [S.l.], [c. 1800]. - [52] fol. : [10] drawings ; 21 cm.
MIP: fol. [6]r–v.
Suppliers: front pastedown, loose sheet at the back.
§ Manuscript.
Language: French.
Compiled around 1800, probably in northern France.
Contains mainly art technological recipes and instructions, such as on preparing painting grounds, gums for watercolours, a machine for drawing silhouettes, making paper transparent, making an etching, and making prints after nature. In between are recipes for liquor, brandy, beer and perfume. With seven drawings of the ruins of the Château de Coucy in northern France, one drawing of a machine for making silhouettes and two drawings of alembics for distilling perfumes.
1 –
Line Etching
2 –

Copper
4 –
Drawing / Nature Printing / Painting
In: RMA, 324 F 34.

NB: Many publications are issued entitled 'Artists Assistant' or 'Artist's Assistant'. Works with such titles containing information about manual intaglio printmaking that are published under the names of **Bowles** (Carington) [No. 045] and **Enfield** (William) [No. 090] are listed separately, which might be related but are not directly copied. For a similar title see also under **Valuable secrets** [No. 342].

014.1

The artist's assistant, in the study and practice of mechanical sciences. Calculated for the improvement of genius. - [1st ed.]. - Birmingham : for the author ; London : sold by T. Evans, 1773. - VI, 7–261, [1] p. : front., pl. ; 17 cm.
§ The possible author is John Payne.
1 –
Line Engraving / Line Etching / Mezzotint
3 –
Pers
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B7; ESTC: no. t162198 (missing); *Levis 1912*: 88.

014.2

The artist's assistant, in the study and practice of mechanical sciences. Calculated for the improvement of genius / [C. le Brun invt.]. - [2nd ed.]. - London : printed for the author and sold by G. Robinson ; Birmingham : sold by M. Swinney, [1785?]. - [3], VI, 7–288, IV p. : front., [10] pl., of which [6] folding ; 19.5 cm [?].
MIP: pp. 192–202.
Supplier: p. 199.
Index: p. I at the back.
With literature.
§ Title description after photocopy.
The text on intaglio printmaking is almost identical to **Bowles** (Carington) [No. 045]; see also **Imison** [No. 159] and **School of wisdom and arts** [No. 296], which have the same text.
Spelman 2001, cat. 44: no. 30; *Spelman 2007*, cat. 63: no. 62: 'A number of drawing masters are recorded in Birmingham at this date, and both James Eagle, and John Giles opened drawing schools and may be candidates for editorship of this anonymous work.' 'Birmingham was an early centre for drawing schools, no doubt fostered and partly funded by the wealth of local industry, however this appears to be the only 18th century treatise for artists that was locally produced.'
1 –
Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Paper
4 –
Drawing / Painting / Sculpture
In: ESTC: no. t122183 (11×).

Artymowski (Roman)
See: **Jurkiewicz** (Andrzej) [No. 164].

Ashley (Alfred)   015.1

The art of etching on copper / by Alfred Ashley ; [etch. by Alfred Ashley]. - [1st ed.]. - London : J. & D.A. Darling, [1849]. - vi, 18, [10] p. : front., engr. titlep., 13 pl. ; 22.5 × 28 cm.
Suppliers: pp. iv–v.
Addenda & corrigenda: between pp. vi and 1.
Advertisement: p. [1].
§ The volume has a typographical title page and an etched title page.
The plates are etchings. The plates are dated '1848' en 1849'. All plates printed by: 'Jas. Yates, Pentonville'.
Intended audience, p. III: 'The rules here laid down, are made principally with a view of rendering them useful to ladies'.
Review: *The Art-Journal*, 11 (1849): 264.
1 –
Line Etching
2 –
Copper / Steel
In: BL; *Hind 1963-1:* 396; *Levis 1912*: 103–104; NUC–1956; NYPL; OCLC (4×); *Singer & Strang 1897*: no. 197.

015.2

The art of etching on copper / by Alfred Ashley. - [2nd ed.]. - London : […], 1851. - […] p. : ill. ; 4º.
NOT SEEN
In: *Hind 1963-1*: 396; *Levis 1912*: 104; **Preissig 1** (Praha 1909) [No. 251]; **Robins** (1922) [No. 269]; *Singer & Strang 1897*: no. 203.

015.3

The art of etching on copper / by Alfred Ashley. - [3rd ed.]. - London : […], 1858. - […] p. : ill. ; 4º.
NOT SEEN
In: ULC.

Neue und alte Techniken der Radierung : ein alchimistisches Werkstattbuch für Radierer (und solche, die es werden wollen) ; Tipps und Tricks aus der Praxis / erfahren, erlesen, erfunden und gesammelt von Wolfgang Autenrieth ; [partly ill. by Wolfgang Autenrieth]. - Krauchenwies : Wolfgang Autenrieth, 2005. - 1. Aufl. - 190 [= 189] p. : Tafel 1, IV–X, 11, [107] diagrams, tab. ; 30 cm.
Literature: p. 169.
Suppliers: p. 177.
Glossary: p. 179.
Subject index: p. 180.
Contents: p. 185.
Ed.: 10 copies.
§ Title means: New and old etching techniques. An alchemical workshop book for etcher (and those who want to be). Tips and tricks from practice
For the most part a collection of recipes, gathered by subject, taken from a large number of practical manuals, see Literature (Appendix 6). Personal experiences are added.
The publication is printed on demand during a longer period, and title description and contents change continuously, see note on p. 3. This title description after the first edition imprint of 10 February 2005.
A free text version is available online: http://www.ätzradierung.de/ (2010).
The *Tafel* are separately inserted reproductions of prints by the author and his students. The diagrams are sketches, line drawings and photographs, partly by the author and partly copied from other manuals.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Relief Etching / Soft-ground
2 –
Aluminium / Brass / Copper / Glass / Iron / Plastic / Silver / Steel / Steelfacing / Stone / Zinc
3 –
Blind Embossment / Casting / Chine Collé / Ink / Multiple-plate Printing / Paper / Printing à la Poupée / Printing in Black / Relief Printing / Viscosity Colour Printing
4 –
Digital Printing / Monotype / Photography / Troubleshooting
5 –
 Conservation and Restoration / Health and Safety
In: Priv.Coll.

016.2
Neue und alte Techniken der Radierung / Wolfgang Autenrieth. - [2nd ed.]. - Krauchenwies : Autenrieth, 2005.
§ Printed on demand.
NOT SEEN

016.3
Neue und alte Techniken der Radierung : ein alchimistisches Werkstattbuch für Radierer und alle, die es werden wollen ; Tipps und Tricks aus der Praxis / erfahren, erlesen, erfunden und ges. von Wolfgang Autenrieth. - 3., überarb. Aufl. - Krauchenwies : Autenrieth, 2005. - 219 S : ill. ; 30 cm.
Literature: p. 197.
§ Printed on demand.
NOT SEEN
In: DNB-F; DNB-L.

016.4
Neue und alte Techniken der Radierung : ein alchimistisches Werkstattbuch für Radierer und alle, die es werden wollen ; Tipps und Tricks aus der Praxis / erfahren, erlesen, erfunden und ges. von Wolfgang Autenrieth ; [partly ill. by Wolfgang Autenrieth]. - 4. nochmals überarb. Aufl. - Krauchenwies : Autenrieth, 2005. - 224 p. : ill. ; 30 cm.
ISBN 3-00-016757-9
§ Printed on demand.
NOT SEEN
In: KVK.

016.5
Neue und alte Techniken der Radierung und der Edeldruckverfahren : ein alchimistisches Werkstattbuch für Radierer und alle, die es werden wollen ; Tipps, Tricks, Anleitungen und Rezepte aus 5 Jahrhunderten / Wolfgang Autenrieth ; [partly ill. by Wolfgang Autenrieth]. - 5., nochmals überarb. Aufl. - Krauchenwies : Autenrieth, 2006. - 228 p. : ill. ; 30 cm.
Literature: p. 202.
§ Printed on demand
ISBN 3-00-016757-9
ISBN 978-3-00-0167577
NOT SEEN
In: DNB-F; DNB-L; HAB.

016.6
Neue und alte Techniken der Radierung : ein alchimistisches Werkstattbuch für Radierer und alle, die es werden wollen ; Tipps und Tricks aus der Praxis / erfahren, erlesen, erfunden und ges. von Wolfgang Autenrieth ; [partly ill. by Wolfgang Autenrieth]. - [6th? ed.]. - Krauchenwies : Autenrieth, 2010. - 230 p. : il. ; 30 cm.
ISBN 3-00-016757-9
Printed on demand.
NOT SEEN
In: KVK.

Printmaking techniques / Julia Ayres. - New York : Watson-Guptil Publications, [1993]. - 160 p. : ill. ; 29 cm.
Contents: p. 7.
MIP: pp. 58–93 : [99] colour ill.
Biographies of artists: p. 154.
Suppliers: p. 157.
Index: p. 159.
ISBN 0-8230-4399-1 (hardcover)
§ Illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Copper / Plastic / Zinc
3 –
Multiple-plate Printing / Ink / Paper / Press / Printing in Black / Printing Polychrome
5 –
Conservation and Restoration / Health and Safety
In: BIP+; OCLC; Priv.Coll.

B

B. (A.X.)
See: **A.X.B.** [No. 001].

B. (G.A.)
See: **Banner** (G.A.) [No. 021].

Verhandeling over eene nieuwe manier om prentteekeningen te vervaardigen, de omtrekken te drukken met roest, schrijf-ink, potlood, enz., en de gewasche tinten met roet of in water opgelosten Oost-Indischen ink. En om uit inlandsche voortbrengselen drukzwart te bereiden / door E[rnst] W[illem] J[an] Bagelaar ; uitgegeven door de Nederlandsche Huishoudelijke Maatschappij. - Haarlem : bij A. Loosjes Pz., 1817. - 30 p. ; 23–23.5 cm. - (Nuttige voorstellen ; 6).
§ Title means: Treatise on a new way to make print drawings, to print the outlines with rust, writing ink, pencil, etc., and the washed tints with rust or Indian ink diluted in water. And to make printing black from inland products
1 –
Aquatint / Drypoint / Soft-ground
2 –
Copper
3 –
Ink / Press
4 –
Woodcut
5 –
Art History / Original and Reproduction
In: CCB; ENS; KB; KUB; KVB; PBM; (Priv.Coll.?); RKD; *Singer & Strang 1897*: no. 97; UBA, ZKW (without call number); UBL (2×), UBL-KHI; UBN-KHI; UBU.

Gravure sur métal / Mireille Baltar ; photos Dominique Santrot. - Paris : Ulisse, cop. 1998 [= 1999]. - 79, [1] p. : [193] colour ill. ; 26 cm. - (Atelier).
Contents: p. 3.
Suppliers: p. 77.
Glossary: p. 78.
Stocklist: p. [1].
ISBN 2-907-601-96-2 (softcover)
§ Title means: Engraving on metal
Title on cover: La gravure sur métal. Taille douce, eau-forte, aquatinte
Date, p. 2: 'dépôt légal, 1er semestre 1999'.
The illustrations are diagrams, photographs and reproductions.
Aimed at amateurs: p. 5.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Chine Collé / Counterproof / Multiple-plate Printing / Printing in Black / Printing Monochrome / Printing Polychrome / Viscosity Colour Printing
In: Priv.Coll.

Etching and other intaglio techniques / by Manly [Miles] Banister. - [1st ed.]. - New York : Sterling ; London ; Sydney : The Oak Tree Press, cop. 1969. - 128 p. : [1], 205 ill. ; 29 cm. - (Arts and crafts books).
List of other titles in the series: p. 2.
Contents: p. 3.
Index: p. 128.
SBN 8069-5136-2 (Sterling, hardcover)
SBN 8069-5137-0 ; SBN 7061-2149-X (Oak Tree, hardcover)
§ Illustrations are diagrams, photographs and reproductions.
Title description after the edition: New York 1986.
1 –
Aquatint / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint
2 –
Aluminium / Copper / Plastic / Steel
3 –
Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
5 –
Art History / Conservation and Restoration
NOT SEEN
In: BL; *Blas Benito 1994*: 73; BLBS; BNB50; NCC; OCLC (21×); UBA (2×).

020.2

Etching and other intaglio techniques / by Manly [Miles] Banister. - [2nd ed.]. - Totowa, N.J. ; Littlefield : Adams, 1974. - 128 p. : [1], 205 ill. ; 28 cm. - (Littlefield, Adams Quality Paperback ; 286).
Contents: p. 4.
Index: p. 128.
ISBN 0-8226-0286-5 (softcover)
§ Unchanged text.
In: *Blas Benito 1994*: 73; OCLC (15×); Priv.Coll.

020.3

Practical guide to etching and other intaglio printmaking techniques / by Manly [Miles] Banister. - Unabridged republication. - New York : Dover, first published 1986. - 128 p. : [1], 205 ill. ; 28.5 cm.
Contents: p. 3.
Index: p: 128.
Stocklist: backside cover.
ISBN 0-486-25165-9 (softcover)
§ P. 2: unabridged republication of New York 1969.
Reissued several times with different covers, but with the same *impressum*.
In: BIP+; Priv.Coll. (2×).

Practical engraving on metal : including hints on saw-piercing, carving and inlaying / by G.A. Banner. - [1st ed.]. - London : Hampton, 1899. - 86 p. : ill. ; 18 cm.
NOT SEEN
In: BL; V&A.

021.2

Practical engraving on metal : including hints on saw piercing, carving, inlaying, &c. / by G.A. Banner. - [2nd ed.]. - London : Marshall, [1922]. - 141 p. : ill. ; 18 cm. - (Marshall's practical manuals).
NOT SEEN
In: BL; BLO.

021.3

Practical engraving on metal : including hints on saw piercing, carving, inlaying, &c. / by G.A. B[anner]. - Third ed. Rev. - London : Cursitor, [c. 1935]. - 161, [3] p. : front. 100 fig. ; 18.5 cm.
Contents: p. 5.
MIP: pp. 74–79, 140–156 : fig. 91–100.
Index: p. 157.
Advertisement: p. [1]
With literature.
§ P. 7: 'In this [third] edition the whole work has been thoroughly revised, re-arranged, and re-edited. It now appears with considerable additions comprising several new chapters, and a general extension to most of the other, while over twenty new illustrations are included.'
P. 26: 'As this book is intended to deal more especially with engraving for surface decoration and not for printing, we will give but a brief description of the latter process.'
The figures are diagrams, photographs and reproductions.
1 –
Drypoint / Line Engraving / Line Etching
2 –
Copper / Zinc
3 –
Rubbing / Steelfacing
4 –
Goldsmithing / Screen Printing

5 –
Art History / Conservation and Restoration
In: NLS; Priv.Coll.

Barratt (Mychael)   022

Intaglio printmaking / Mychael Barratt. - London : A&C Black, 2008. - 128 p. : ill., partly in colour ; 23.5 cm. - (Printmaking handbooks).
ISBN 0-7136-7388-5 (softcover)
ISBN 978-07136-7388-3 (softcover)
§ Announcement: *Printmaking Today*, 17 (2008), 2: 34.
NOT SEEN
In: BL; KVK.

Barry (John Joseph)   023.1

How to make etchings / by John J[oseph] Barry. - [1st ed.]. - Pelham, N.Y. : Bridgeman, cop. 1929. - 64 p. : ill. ; 13 fig., [17] reprod. ; 22.5 cm.
Contents: p. 7.
List of materials: p. 63.
§ Preface, p. 5: 'New York City, Jan. 3rd, 1929.'
The illustrations are diagrams and reproductions.
1 –
Drypoint / Line Etching
2 –
Copper / Steelfacing / Zinc
3 –
Ink / Paper / Press / Printing in Black
5 –
Conservation and Restoration
In: NUC–1956; OCLC; Priv.Coll. (2×).

023.2

How to make etchings / by John J[oseph] Barry. - [1st ed.]. - London : Lane, The Bodley Head, cop. 1929. - 64 p. : 13 fig., [17] reprod. ; 22.5 cm.
Contents: p. 7.
In: *Blas Benito 1994*: 73; BLBS; KB; OCLC (16×); ULC.

023.3

How to make etchings / by John J[oseph] Barry. - [2nd ed.]. - London : Lane, 1930. - 64 p. : ill. ; 8º.
§ BL: 'Printed in U.S.A.'.
NOT SEEN
In: BL; KVK.

023.4

How to make etchings / by John J[oseph] Barry. - Third ed. - Pelham, N.Y. : Bridgeman, 1938. - 64 p. : [30] fig. ; 22 cm. - (Bridgeman art books).
Contents: p. 7.
List of materials: p. 63.
Stocklist: backside cover, flaps.
In: OCLC (19×); Priv.Coll.

Barth (Carl)
See: **Longhi** (Giuseppe) [No. 189].

Bate (John) 024.1

The mysteryes of nature and art: conteined in foure several tretises. The first of water workes. The second of fyer works. The third of drawing, colouring, painting, and engraving. The fourth of divers experiments, as wel serviceable as dilightful / partly collected, and partly of the authors peculiar practice, and invention by J[ohn] B[ate] ; [titlep. engr. by John Droeshout]. - [1st ed.]. - London : imprinted for Ralph Mab, 1634. - Fol. [1], A–B\4, C\4+1, D–Q\4, q\4, R–T\(4–1), Aa–Ff\4 [= 192 p.] : [94] ill. ; 18.5 cm.
MIP: pp. 134, 136–142 : ill. [89]–[90].
Supplier: p. 140.
§ Parts 2, 3 and 4 have their own title pages.
The foliation is given because the paging is erratic; the collation is as follows: [13], 1–14, [2], 15–45, [8], 54–99, [3], 103–112, [16], 121–133, [1], 134, 136–142, [3], 150–192 p.
The illustrations are woodcuts.
Recipes for red, white and black etching ground on p. 141 are copied in **Browne 2** (London 1669) [No. 49] and after that in **Art of drawing** (London 1755) [No. 012].
Title description after the photomechanical reprint: Amsterdam 1977 [No. 024.6].
1 –
Line Engraving / Line Etching
2 –
Brass / Copper
4 –
Painting
NOT SEEN
In: BLO; OCLC; *Pollard & Redgrave 1976–1991*: no. 1577; *Singer & Strang 1897*: no. 6.

024.2

The mysteryes of nature and art: conteined in foure several tretises. The first of water workes. The second of fyer works. The third of drawing,

colouring, painting, and engraving. The fourth of divers experiments, as wel serviceable as dilightful / partly collected, and partly of the authors peculiar practice, and invention by J[ohn] B[ate] ; [titlep. engr. by John Droeshout]. - [1st ed.]. - London : imprinted for Ralph Mab and are to be sold by Iohn Iackson [and] Francis Church, 1634. - Fol. [1], A-Q4, 24, R-T4, Aa-Ff4 [= 192 p.] : ill. ; 18.5 cm.
MIP: pp. 134, 136–142 : ill. [89]–[90].
Supplier: p. 140.
§ *Pollard & Redgrave*: 'A variant w. imprint on gen. tp.'
Parts 2, 3 and 4 have their own title pages.
ULC: 'T.p. engraved by John Droeshout. Cf. A.F. Johnson. A cat. of engraved and etched Engl. title-pages, p. 12. Book 2–4 each have separate t.p. with imprint: 'London, Printed by Thomas Harper for Ralph Mab, 1634'.'
The illustrations are woodcuts.
Title description after the photomechanical reprint: Amsterdam 1977.
NOT SEEN
In: BL; BS; NUC–1956 (9×); OCLC; *Pollard & Redgrave 1976–1991*: no. 1577.5; *Singer & Strang 1897*: no. 6.

024.3

The mysteries of nature and art. In foure severall parts. The first of water works. The second of fire works. The third of drawing, washing, limning, painting, and engraving. The fourth of sundry experiments / by Iohn Bate ; [poems by Ios. Bernard and T.T.] ; [G. Gifford sculp.]. - The second ed.; with many editions unto every part. - [London] : printed for Ralph Mabb, 1635. - [12], 288, [16] p. : portrait, engr. titlepl., [104] woodcuts; 19 cm.
MIP: pp. 226–232 : [2] woodcuts
Book 3: Of drawing, limming, colouring, painting and graving. - P. 231–266 : [2] woodcuts.
Index: p. [1] at the back.
§ Parts 2, 3 and 4 have their own title pages.
Pollard & Redgrave: 'Ass'd by Mabb to J. Bloome 1 jn.'
Portrait of Bate in Line Engraving: 'Vera Effigies Johannis Bate. G. Gifford sculp.'
1 –
Line Engraving / Line Etching
2 –
Copper
4 –
Painting / Woodcut
In: BL (3×); BN; BS; DBI-VK; NUC–1956 (19×); NSUG; OCLC; *Pollard & Redgrave 1976–1991*: no. 1578; *Singer & Strang 1897*: no. 7; ULG.

024.4

The mysteries of nature and art. In four severall parts. The first of water-works. The second, of fire-works. The third of drawing, colouring, limming, paynting, graving, and etching. The fourth of experiments / by John Bate. - Third ed. with many additions. - London : printed for Andrew Crook, 1654. - 221, [9] p. : ill, pl. ; 19.5 cm.
§ BL: 'With an additional engraved titlepage'. Parts 2, 3 and 4 have their own title pages.
The name of the publishers is spelled 'Crooke' on the plates.
NOT SEEN
In: BL; GMPL; DBI-VK; NUC–1956 (9×); OCLC; *Singer & Strang 1897*: no. 13; *Wing 1972–1988*: no. B1092.

024.5

[Pt. 3:] Of drawing, limming, colouring, painting and graving / John Gurdon. - [London?], 1673.
§ Manuscript.
Language: English.
Copy of chapter 3 of 'The mysteryes of nature and art'. Unclear what edition is used.
Bound together with a manuscript copy of 'The excellency of the pen and pencil', see also: **Excellency** (London 1670) [No. 098.2].
Title description after NUC.
NOT SEEN
In: LC-RC, ms. no. 20; NUC–1956.

024.6

The mysteryes of nature and art / J[ohn] B[ate]. - [Photom. repr.]. - Amsterdam : Theatrum Orbis Terrarum ; Norwood, N.J. : Johnson, 1977. - [13], 1–14, [2], 15–45, [8], 54–99, [3], 103–112, [16], 121–133, [1], 134, 136–142, [3], 150–192 p. : engr. titlep., [94] ill. ; 22 cm. - (The English experience, its record in early printed books published in facsimile ; 845).
MIP: pp. 134, 136–142 : ill. [89]–[90].
Supplier: p. 140.
ISBN 90-221-0845-7 (hardcover)
§ Photomechanical reprint after the copy in the Bodleian Library, Oxford, of: London: imprinted for Ralph Mab, 1634 [No. 024.1].
In: BL; DBI-VK; KB; UBA; ULC.

Battistoni (Arnaldo)   025

Techniche dell'incisione / Arnaldo Battistoni. - Vicenza : Pozza, 1973. - 72 p. : 54 fig. ; 23 cm.
Contents: p. 5.
Press manufacturer: p. 49.
§ Title means: Technique of engraving
1 –
Aquatint / Drypoint / Lift-ground / Line engraving / Line etching / Mezzotint / Soft-ground
2 –
Copper / Zinc
3 –
Multiple-plate Printing / Press / Printing in black / Printing Polychrome / Steelfacing
Monotype
5 –

Art history
In: Priv.Coll.

Bayard (Émile)   026.1

La cellulotypie : ou l'art de la gravure en taille-douce, mis à la portée de tous. Nouvelle méthode à la portée de tous / par Émile Bayard ; [pl. by Émile Bayard, B. de Beaupré, William Bouguereau, A.-F. Gorguet, Georges Scott]. - Première éd. - Paris : Imprimerie des Beaux Arts, [1901]. - 32, [10] p. : [5] ill., 2 fig., 5 pl. ; 24–25 cm. - (Bibliothèque artistique).
Contents: p. [1].
Advertisement: p. [5]–[6].
List of books in the series: p. [10].
§ Title means: The cellulotype: or the art of engraving for everyone. New method for everyone
Date: 'dépôt légal, 1901'. The plates by Bayard and by Bougerau are dated '1901'.
The illustrations are diagrams, the *figures* are wood engravings. The *planches* are impressions of *cellulotypies*.
Title description after microfilm.
1 –
Drypoint
2 –
Plastic
3 –
Press / Printing à la Poupée / Printing in Black / Printing Polychrome
In: BNP; NUC–1956; OCLC.

026.2

La cellulotypie ... [etc.] / [par Émile Bayard?]. - [2nd ed.]. - Paris : Lafranc, 1907.
NOT SEEN
In: Priv.Coll.

Béguin (André)   027.1

L'aquatinte à l'aérograph. Nouveau procédé de gravure au grain / André Béguin. - Bruxelles : Béguin, 1975. - 57 p. [7?] ill. ; 29 cm.
§ Title means: The aquatint by the airbrush. New process of aquatint
Béguin himself printed this book by means of silkscreen; *Béguin 2005*, p. 2.
NOT SEEN
In: *Blas Benito 1994*: 74; *Figueras Ferrer 1992:* 1027; OCLC (2×).

027.2

L'aquatinte à l'aérograph. Nouveau procédé de gravure au grain / André Béguin. - Nouvelle éd. rev. - Paris : Béguin, 1986. - 93 p. : [19] ill. ; 21 cm.
Lists of works by the author: p. 4, backside cover.
Contents: p. 7.
ISBN 2-903319-19-7 (softcover)
§ Illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Lift-ground / Line Etching / Soft-ground
2 –
Copper / Steel / Steelfacing / Zinc
3 –
Counterproof / Ink / Multiple-plate Printing / Paper / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Art History
In: OCLC; Priv.Coll. (2×).

027.3

A treatise on aquatint : including a new airbrush technique for graining etchings / André Béguin ; transl. by Allen J. Grieco and Sara F. Matthews-Grieco. - Bruxelles : Béguin, 1980. - 89 p. : [10] ill. ; 21 cm.
List of works by the author: p. 2.
Contents: p. 5, 89.
Addenda & corrigenda: loose.
ISBN 2-903319-10-3 (softcover)
§ Translations of the edition: Bruxelles 1975.
Illustrations are diagrams, photographs and reproductions; most illustrations are different from the original French edition.
In: *Béguin 2005*: 22; *Blas Benito 1994*: 74; OCLC (8×); Priv.Coll. (2×).

027.4

A treatise on aquatint : including a new airbrush technique for graining etchings / André Béguin ; translation by Allen J. Grieco and Sara F. Matthews-Grieco. - 2e éd. - Paris : Béguin, 1999. - 97 p. : [12] ill. ; 21 cm.
List of works by the author: p. 2.
Contents: p. 5, 89.
ISBN 2-903319-10-3 (softcover)
§ Translations of the edition: Bruxelles 1975.
The addenda & corrigenda are processed, the cover is changed and adapted. P. 93 has a reproduction of the printshop in **Bosse** (Paris 1745) [No. 042.8]: 129, with a comment by Béguin. For the rest, text, illustrations and layout are the same as in the 1980 volume.
Review: *Print Quarterly*, 18 (2001) 3: 333.
In: Priv.Coll.

Behaim (Paulus)
See: **Regeln** [No. 263].

El grabado no toxico en la escuela / Ana Bellido Zambrano ; prólogo Clemente Barrena. - [Estepona (Málaga)] : [Bellido], [2004]. - 113, [4] p. : ill., partly in colour ; 21 cm.
Contents: p. 2.
Literature: p. 112
ISBN 84-609-6623-2 (softcover)
§ Title means: Non-toxic engraving in the school
Review: *Grabado y edición*, 1 (2006) 2: 42.
NOT SEEN
In: BNM.

El grabado no toxico en la escuela / Ana Bellido Zambrano ; prólogo Clemente Barrena. - [Estepona (Málaga)] : [Bellido], [c. 2008?]. - 113, [4] p. : ill., partly in colour ; 21 cm.
Contents: p. 2.
Literatre: p. 112
ISBN 84-609-6623-2 (softcover)
§ Identical text, different cover.
1 –
Aquatint / Collagraph / Drypoint / Line Etching / Photomechanical Etching / Soft-ground
2 –
Aluminium / Brass / Copper / Photopolymer Film / Steel / Zinc
3 –
Printing in Black
4 –
Linocut / Monotype / Woodcut
5 –
Art History / Health and Safety
In: Priv.Coll.

Bell (Clive)
See: **Evelyn** (John) [No. 097].

Bergström (Gunnar)
See: **Goetz** (Henri) [No. 123].

Bern (Karl Stauffer)
See: **Stauffer-Bern** (Karl) [No. 320].

Nouveau manuel complet de l'imprimeur en taille douce / par [?] Berthiaud ; rédigé par [Pierre] Boitard ; enrichi de notes et d'un appendice renferment tous les nouveaux procédés, les découvertes, méthodes et inventions nouvelles appliquees ou applicables à cet art par MM. Finot, Pointot (Reglement), Rémond et autres imprimeurs de la capitale. - Paris : Roret, 1837. - [2], 320 p. : 4 folding pl. ; 15–16 cm. - (Manuels Roret ; 375).
Literature: p. 120.
List of French paper formats: p. 145.
Regulations of Paris printshops: p. 310.
Contents: p. 317.
§ Title means: New complete manual for the plate printer
Boitard calls himself the author of this publication, but says he relied completely on the plate printer Berthiaud (p. 4). Berthiaud collected the materials for this publication in Paris and London (p. 5), and Boitard edited this.
The name on the title page is 'Berthiaud', and on p. 4 and 5 'Berthiau'. References to the spelling of the name are incongruous and any personal data for this person is lacking, for which reason the spelling on the original title page is maintained.
Photomechanical reprint: Paris 1978 [No. 029.4].
2 –
Bronze / Copper / Steel / Zinc
3 –
Chine Collé / Counterproof / Ink / Multiple-plate Printing / Paper / Parchment / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Aesthetics
In: *Bigmore & Wyman 1880–1886*, 1: 52; BL; *Blas Benito 1994*: 67; BL; BN; BNM; *Börsenverein 1885*; *Bridson & Wakeman 1984*: no. B71; CCB; *Figueras Ferrer 1992*: 1027; DNB-L; NCC; NUC–1956; OCLC (2×); Priv.Coll.; *Singer & Strang1897*: no. 150; UBA; UBN.

[Notes on etching and printing] / J.C. Gaal du Waye [?]. - [S.l.], 1851.
In: **Berthiaud** (Paris 1837) [No. 029.1]: between pp. 58 and 59, 186 and 187.
§ Manuscript.
Language: French.

Notes after **Bosse** (Paris 1745) [No. 042.8].
Owner's inscription of J.C. Gaal du Waye (?) on front flyleaf recto.
This is the same text as described under **Bosse** [No. 042.10].
1 –
Line Etching
3 –
Printing in Black
In: UBA, Zaal Boekhandel: 278.

029.3

Nouveau manuel complet de l'imprimeur en taille douce / par [?] Berthiaud ; rédigé par [Pierre] Boitard ; enrichi de notes et d'un appendice renferment tous les nouveaux procédés, les découvertes, méthodes et inventions nouvelles appliquées ou applicables à cet art par MM. Finot, Pointot (Reglement), Rémond et autres imprimeurs de la capitale. - Paris : Librarie Encyclopédie de Roret, [1880]. - 320, [71] p. : 4 folding pl. ; 16 cm. - (Encyclopédie Roret).
Advertisements: p. [71].
§ Half-title: Encyclopédie-Roret. - 'Septembre, 1880 ... Librarie encyclopédique de Roret'.
NOT SEEN
In: KVK; NUC–1956; OCLC (4×); V&A.

029.4

Nouveau manuel complet de l'imprimeur en taille douce. Enrichi de notes et d'un appendice renfermant tous les nouveaux procédés, les découvertes, méthodes et l'invention nouvelles appliquées ou applicables a cet art, par plusieurs imprimeurs de la capitale / par [?] Berthiau ; rédigé par [Pierre] Boitard ; enrichi de notes et d'un appendice renferment tous les nouveaux procédés, les découvertes, méthodes et inventions nouvelles appliquees ou applicables à cet art par MM. Finot, Pointot (Reglement), Rémond et autres imprimeurs de la capitale. - Reéd. - Paris : Laget, 1978. - 320 p. : 4 ill. ; 18 cm. - (Manuels-Roret, Encyclopédie-Roret).
Edition number: 500 copies.
ISBN 2-85204-068-9 (hardcover)
§ The name 'Berthiaud' on the original title page is changed to 'Berthiau' on the title page of the photomechanical reprint.
Photomechanical reprint of the edition: Paris 1837 [No. 029.1].
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B71; DBI-VK; KVK; OCLC (3×); ULC.

Betti (Darío) 030.1

Tecnica dell'incisione : incisione su legno (xilografia), chiaroscuro, xilografia a colori, incisione su linoleum, incisione su metallo, l'acquaforte, la punta secca, l'acqua tinta, il bulino, la maniera nera, la vernice molle, il monotipo, l'acquaforte in rilievo, la litografia / Darío Betti. - [1st ed.]. - Firenze : ALEF, 1950. - 115 p. : [8] pl. with fig., ill. ; 17 cm.
Title means: Engraving techniques : wood engraving, engraving in metal, lithography
NOT SEEN
In: KVK; MET, 4th supplement (1970).

030.2

Tecnica dell'incisione : xilografia, incisione su metallo, litografia / Darío Betti. - 2a ed. - Fiorenze : Arnaud, 1968. - 127 p. : 19 ill. ; [c. 18 cm?]
MIP: pp. 37–89 : [10] ill.
Literature: p. 123.
Contents: p. 125.
§ Title description after microfilm.
The *illustrazioni* are diagrams, photographs and reproductions.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Zinc
3 –
Paper / Press / Printing in Black
4 –
Linocut / Monotype / Screen Printing / Woodcut / Wood Engraving
In: *Blas Benito 1994*: 74; KVK.

030.3

Tecnica dell'incisione : xilografia, incisione su metallo, litografia / Darío Betti. - 3a ed. Fiorenze : Arnaud, 1971. - 128 p. : 19 fig. ; 17 cm.
MIP: pp. 39–89 : [7] fig.
Literature: p. 123.
Contents: p. 125.
In: *Blas Benito 1994*: 74; KVK; Priv.Coll.

030.4

Tecnica dell'incisione : xilografia, incisione su metallo, litografia / Darío Betti. - 4a ed. Fiorenze : Arnaud, 1977. - 77 p. : [8] ill. ; 17 cm.
MIP: pp. 19–55 : [4] fig.
Literature: p. 73.
Contents: p. 75.
In: KVK; Priv.Coll.

Billettes (Gilles)
See: **Filleau des Billettes** (Gilles) [No. 102].

Radierung. Lineare Verfahren / Gerhard Birkhofer, Hubert Sonner. - Ravensburg : Maier, 1980. - 95, [1] p. : 49 Abb. ; 24 cm. - (Bibliothek der Gestaltungstechniken).
Contents: p. 5.
Glossary: p. 93.
Stocklist: p. [1].
ISBN 3-473-61262-6 (hardcover?)
§ Title means: Etching. Line processes
The *Abbildungen* are diagrams, photographs and reproductions.
1 –
Drypoint / Échoppe / Line Etching
2 –
Copper / Zinc
3 –
Printing in Black
4 –
Troubleshooting
5 –
Aesthetics / Art History / Conservation and Restoration
In: DNB-F; DNB-L.

Radierung : Aquatinta und andere flachige Verfahren / Gerhard Birkhofer, Hubert Sonner ; fotografische Gestaltung Jiri Kohout. - Ravensburg : Maier, 1982. - 80 p. : 54 Abb. ; 24 cm. - (Bibliothek der Gestaltungstechniken).
Contents: p. 5.
Glossary: p. 79.
ISBN 3-473-61263-4 (hardcover)
§ Title means: Etching: aquatint and other tonal processes
The *Abbildungen* are diagrams, photographs and reproductions.
1 –
Aquatint / Mezzotint / Lift-ground / Soft-ground
2 –
Aluminium / Copper / Zinc
3 –
Printing in Black / Relief Printing
5 –
Aesthetics / Art History
In: DNB-F; DBI-VK; DBSM; NSUG; OCLC (2×); UBH.

Ätzradierung / Gerhard Birkhofer. - [1st ed.]. - Frankfurt [am Main] : ALS-Verlag, 1980. - 3 vol. : ill. ; 30 cm. - (Gestalten, werken, basteln).
§ Title means: Etching
– Vol. 1: Linien- und Flächenätzung. - 32 fol. : ill.
ISBN 3-921366-92-5
– Vol. 2: Spezielle Tiefdruckverfahren. - 32 fol.: ill.
ISBN 3-921366-93-3
– Vol. 3: Kaltnadelradierung. - [1980?]. - 32 fol. : ill.
NOT SEEN
In: DNB-F.

Ätzradierung / Gerhard Birkhofer. - [2nd ed.]. - Frankfurt [am Main] : ALS-Verlag, [ca. 1985–1987] - 3 vol. : ill. ; 30 cm. - (Gestalten, werken, basteln).
§ Dates are estimated, no date in the publication.
The illustrations are diagrams and reproductions.
Loose sheets in folder.
– Vol. 1: Ätzradierung I. Linien- und Flächenätzung. - 32 fol. : [29] ill.
Contents: p. 1.
ISBN 3-921366-92-5
– Vol. 2: Ätzradierung II. Spezielle Tiefdruckverfahren. - 32 fol. : [32] ill.
Contents: p. 2.
ISBN 3-921366-93-3
– Vol. 3: Kaltandelradierung. - 32 fol. : [94] ill.
Contents: p. 1
ISBN 3-921366-89-5
§ This volume discusses intaglio printing.
1 –
Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Marbling / Mezzotint / Soft-ground
2 –
Zinc
3 –
Printing in Black / Ink / Paper / Press

5 –
Art History / Conservation and Restoration
In: DNB-F; DBI-VK; DNB-L; NSUG.

Tiefdruck / Gerhard Birkhofer; [photo cover by Ernst Fesseler]. - Originalausg. [1st ed.]. - Ravensburg : Ravensburger Buchverlag, cop. 1996. - 157, [2] p. : [214] ill., of which [109] in colour ; 26.5 cm. - (Ravensburger Druckwerkstatt).
Contents: p. 5.
Literature: p. 148.
Suppliers: p. 149.
Index: p. 150.
List of works in the series: p. [1].
Stocklist: p. [2].
ISBN 3-473-48384-2 (hardcover)
§ Title means: Intaglio printing
The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Crayon Engraving / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Relief Etching / Soft-ground
2 –
Aluminium / Copper / Iron / Plastic / Steelfacing / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing
4 –
Photography / Troubleshooting
5 –
Art History
In: DNB-F; DBI-VK; NSUG; Priv.Coll.

Tiefdruck / Gerhard Birkhofer ; [photo cover by Ernst Fesseler]. - [2nd ed.]. - Stuttgart : Urania, 2007. - 157, [2] p. : [214] ill., of wich [109] in colour ; 26.5 cm. - (Kunst und Gestaltung).
Contents: p. 5.
Literature: p. 148.
Suppliers: p. 149.
Index: p. 150.
Advertisement: p. [1].
ISBN 978-3-332-01955-1 (hardcover)
§ There is an occasional reference to a publisher 'Christophorus' for this issue (same ISBN), which might be an error.
In: Priv.Coll.

The etcher's guide / by Thomas Bishop ; [etch. by Thomas Bishop]. - Philadelphia : Janetzky, 1879. - 22, [1] p. : V pl. ; 22.5 cm.
List of illustrations: p. 20.
Suppliers: pp. 10, 16, 22.
Index: p. [1].
§ Plate V is the frontispiece.
Date, p. 21: 'Philadelphia, 1879'.
1 –
Drypoint / Line Etching / Mezzotint
2 –
Brass / Copper / Steel
3 –
Casting
In: BAI-1901, vol. 61: 256; BL; BLBS; *Levis 1912*: 106; NUC–1956; OCLC (13×).

Några tekniska förfaringssätt i etsningskonst / Pehr M. Blom ; [diagrams and prints by Pehr M. Blom]. - Helsingfors : Hufvudstadsbladets nya tryckeri, 1922. - 16 p. ; 9 fig. ; [c. 22] cm.
Contents: p. 16.
§ Title means: Some technical procedures in the art of etching
The preface is dated: "Helsingfors i februari 1922".
The figures are diagrams and reproductions.
Title description after photocopy.
P. 2: the publication is meant for amateurs in this art.
1 –
Aquatint / Drypoint / Line Etching / Mezzotint / Soft-ground
2 –
Brass / Bronze / Copper / Steel / Zinc
3 –
Printing in black

4 –
Monotype
In: LIBRIS (2×); NUC–1956; NYPL.

Etsaustaiteen, teknillisiä menettelytapoja / Pehr M. Blom ; [diagrams and prints by Pehr M. Blom]. - Rauma : Rauman Kirjateollisuus, 1924. - 16 p. : 9 kuv. ; [c. 22] cm.
Contents: p. 16.
§ Title means: Some technical procedures in the art of etching
The preface dated, p. 2: 'Helsingissä, helmikuussa 1923, Pehr M. Blom'.
Finnish translation of the edition: Helsingfors 1922.
The *Kuv.* are diagrams and reproductions.
In: Priv.Coll.

Blon (Jacque Christoph Le)
See: **Le Blon** (Jacque Christoph) [No. 180].

Böckler (Georg-Andreas)
See: **Bosse** (Abraham) [No. 042.12].

Håndbog i non-toxic dybtryk : akrylbaserede ætsegrunde, fotopolymerfilm, ætsning / Henrik Bøegh ; fotos, illustration Henrik Bøegh, Poul von Linstow. - København : Bøegh, 1998. - 120 p. : [110] ill. ; 21 × 20 cm.
Stocklist: p. 2.
Contents: p. 5.
Literature: p. 118.
Suppliers: p. 118.
Index: p. 119.
ISBN 87-982792-9-7 (softcover)
§ The preface is dated, p. 4: 'oktober 1998'.
A 60-minute video – 'Non-toxic intaglio step by step' – was released in conjunction with this book in May 2000. Review: S. Hoskins, in *Printmaking Today*, 10 (2001), 1: 33.
1 –
Aquatint / Collagraph / Crayon Etching / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Photopolymer Film / Zinc
3 –
Blind Embossment / Printing in Black / Relief Printing
4 –
Digital Printmaking
5 –
Health and Safety
In: KVK; Priv.Coll. (2×).

Håndbog i non-toxic dybtryk: akrylbaserede ætsegrunde, fotopolymerfilm, fotopolymer plader, ætsning / Henrik Boegh. - 2. udgave. - København : Bøegh, 2011. - 116 p. : [134] il. ; 21 × 21 cm.
Contents: p. 6.
Literature: p. 115.
Index: p. 115.
ISBN 978-87-994569-0-1
§ The preface is dated, p. 5: 'Juni 2011 Henrik Bøegh'.
In: Priv.Coll.

Handbook of non-toxic intaglio : acrylic resists, photopolymer film & solar plates, etching / Henrik Bøegh. - [1st ed.]. - København : Bøegh, 2003. - 106, [1] p. : [130] ill. ; 21 × 21 cm.
Stocklist: p. 2.
Contents: p. 5.
Literature: p. 104.
Index: p. 104.
ISBN 87-987757-2-3 (softcover)
§ Fully revised edition.
Review: C. Gale, 'Handbook of non-toxic intaglio', in *Printmaking Today*, 12 (2003) 4: 30.
In: Priv.Coll.

Handbook of non-toxic intaglio : acryclic resists, photopolymer plates, etching / Henrik Bøegh. - Second ed., first printing. - København : Bøegh, 2008. - 117 p. : [135] ill. ; 21 × 21 cm.
Contents: p. 6.
Literature: p. 116.
Index: p. 116.
ISBN 978-87-987757-6-8 (softcover)
§ Copyright: 2007.

The preface is dated, p. 5: 'January 2008'.
Announcement: *Printmaking Today*, 17 (2008) 3: 34.
In: KVK; Priv.Coll.

<div align="right">037.5</div>

Manual de grabado en hueco no tóxico : barnices acrílicos, película de fotopolímero y planchas solares y su mordida / Henrik Bøegh ; prologo Juan Carlos Ramos Guadix ; traducción de Ignacio López Moreno, Juan Carlos Ramos Guadix. - Granada : Universidad de Granada, 2004. - [1st ed.]. - 156 p. : [130] ill. ; 21.5 × 21.5 cm.
Index: 145.
Contents: p. 149.
ISBN 84-338-3222-0 (softcover)
§ Unaltered translation of: København 2003.
See also: **Ramos Guadix** (Juan Carlos) [No. 258].
In: BNM.

<div align="right">037.6</div>

Manual de grabado en hueco no tóxico : barnices acrílicos, película de fotopolímero y planchas solares y su mordida / Henrik Bøegh ; prologo Juan Carlos Ramos Guadix ; traducción de Juan Carlos Ramos Guadix. - Segunda ed., primera agotada. - København : Bøegh, 2010. - 119 p. : [135] ill. ; 21 × 21 cm.
Contents: p. 119.
Literature: p. 118.
Index: p. 7.
ISBN 978-87-987757-7-5 (softcover)
§ The preface is dated, p. 7: 'Copenhague, Febrero 2010'.
NOT SEEN
In: KVK.

<div align="right">037.7</div>

Niet-toxisch etsen, handboek. Zuurbestendige acrylaten, fotopolymeerfilm, fotoplymeerplaten, etsen / Henrik Bøegh ; ten geleide, vertaling en bewerking door Filip Le Roy. - Grimbergen: Le Roy, 2006. - 117 p. : [132] ill. ; 21 × 21 cm.
Contents: p. 8.
Literature: p. 116.
Index: p. 116.
ISBN 90-81030-31-0 (softcover)
§ Revised translation of: København 2003. With extra appendix on etching zinc with copper sulphate and some new products.
In: Priv.Coll.

<div align="right">037.8</div>

La gravure non-toxique : manuel pratique. Les vernis acryliques. Les films et placques photopolymères, la morsure / Henrik Bøegh ; traduction Filip Le Roy, Jean-Marc Deltorn. - Grimbergen: Le Roy, 2008. - 120 p. : [132] ill. ; 21 × 21 cm.
Contents: p. 8.
Literature: p. 119.
Index: p. 119.
ISBN 978-9-08-103032-8 (softcover)
§ Translation of: Grimbergen 2006.
The preface is dated, p. 7: 'Novembre 2008'.
Review: *Nouvelles de l'estampe* (2009) 227–228: 67, 'Premier du genre en langue française'.
In: Priv.Coll.

<div align="right">037.9</div>

§ A Turkish translation was planned for publication in 2012.
If published this will be the first practical manual on intaglio printmaking in Turkish.
NOT PUBLISHED
Boitard (Pierre)
See: **Berthiaud**, (...) [No. 029].

Bonanni (Filippo)
See: **Buonanni** (Filippo) [No. 055].

<div align="right">**Bonnell** (Mandy) & **Mumberson** (Stephen)   038</div>

Printmaking on a budget / Mandy Bonnell, Stephen Mumberson. - London : A&C Black, 2008. - 144 p. : ill., mainly in colour ; 24 cm. - (Printmaking handbook).
Literature: p. 139.
Index.
ISBN 0-7136-7349-4 (softcover)
ISBN 978-0-7136-7349-4 (softcover)
§ Review: N. Morley, in *Printmaking Today*, 17 (2008) 4: 34.
1 –
Line Etching
NOT SEEN
In: BL; BLO; ULC; V&A.

<div align="right">**Bonnet** (Louis Marin)   039.1</div>

Le pastel en gravure / inventé et executé par Louis [Marin] Bonnet. - Paris : Louis Marin Bonnet, 1769. - [17] p. : 8 colour pl. ; [41] cm.
§ Title means: The engraved pastel drawing

Manuscript.
Language: French.
Manuscript with pasted-in prints. Every opening shows a manuscript text on the left and a print on the right. All prints are crayon engravings, printed in colour. The eight colour prints show the steps of Bonnet's system for a full-colour reproduction of a pastel drawing, printing monochrome and *à la poupée* inked plates on top of each other. The adjacent texts give information on the inks used.

The print, known as *Tête de Flore*, reproduces the pastel drawing that François Boucher made of his younger daughter Marie-Émilie (born 1740) in 1757. Bonnet offered this volume of proofs to the Marquis de Marigny who in turn presented it to King Louis XV in 1769. The queen was very pleased with it and Bonnet received a gratuity of 50 *Louis-d'ors* in 1771; **Bosse** (Paris 1758 [= 1769]) [No. 042.11]: 140–141; *Herold 1935*, pp. 18–19.

The earliest reference to the manuscript is in: **Meynier** (Hof 1804) [No. 208]: 3. The volume is mentioned regularly in later bibliographies as a published book but only few authors are aware that it concerns a manuscript with pasted-in prints.
Title description after colour slides.
1 –
Crayon Engraving
3 –
Ink / Multiple-plate Printing / Printing Polychrome
In: BA; *Blas Benito 1994*: 67; *Figueras Ferrer 1992*: 1032; *Singer & Strang 1897*: no. 57.

039.2

Louis-Marin Bonnet (1736–1793): catalogue de l'oeuvre gravé / Jacques Herold. - Paris : Société pour l'étude de la gravure française, 1935. - XII, 432 p. : ill. ; 28 cm.
MIP: pp. 123–124.
§ An incomplete transcription of the text is found on pp. 123–124. The series of plates is not reproduced.
In: UBA; UBL-KHI.

039.3

Regency to Empire, French printmaking 1715–1814 / Victor I. Carlson, John W. Ittmann [org.]. - Baltimore : Baltimore Museum of Art; Minneapolis: Minneapolis Institute of Arts, 1984. - 371 p. : ill. ; 29 cm.
MIP: pp. 194, 196.
ISBN 0-912964-22-7 (hardcover)
ISBN 0-912964-23-5 (softcover)
§ Herold's incomplete transcription (see Paris 1935) is copied literally on pp. 194, 196. The final print is reproduced on p. 195.
In: UBA; UBL-KHI; VU.

039.4

Louis Marin Bonnet, 'La pastel en gravure', Paris 1769 / Ad Stijnman. - Oudewater : Stijnman, 1998. - [4] p. ; 30 cm.
§ Typescript.
Language: Dutch.
Introduction with a new and complete transcription of the French text, together with translations in Dutch and in English. The translation is based on colour slides of the volume and Herold's 1935 incomplete transcription.
The text is disseminated amongst the members of the working group for printmaking techniques in the Netherlands 'Dr. N.G. van Huffel'.
In: Priv.Coll.

039.5

Colorful impressions. The printmaking revolution in eighteenth-century France / Margaret Morgan Grasselli. - Washington: National Gallery of Art, Lund Humphries, 2003. - X, 185 p. : ill. ; 28 cm.
MIP: pp. 68–70.
ISBN 0-85331-892-1 (hardcover)
ISBN 0-89468-309-8 (softcover)
§ Herold's incomplete transcription (see Paris 1935) is translated into English on pp. 68–70. Accompanying the translation are reproductions of the eight impressions of the set of loose sheets in the National Gallery of Art, Washington, Rosenwald Collection 1946.21.48. This set does not have the accompanying text.
In: KB; Priv.Coll.; UBA; UBL-KHI; UBU; VU.

Book of drawing   040.1
A book of drawing, limning, washing or colouring of maps and prints: and the art of painting, with the names and mixtures of colours used by the picture-drawers. Or, the young-mans time well spent. ... [etc.]. - London : for Thomas Jenner, 1647. - [42?] p. : pl. [?] ; 2º.
§ The anonymous author copied parts of the text from **Academia italica** [No. 003].
The first editions of this treatise do not have any information on etching, which appears only from the 1675 edition.
Spelman 1998, cat. 38, p. 25: 'The work was re-titled as above, and possibly pirated by James and Joseph Moxon for Thomas Jenner in 1647. Rostenberg notes that there is no record of Jenner having the rights to this work. *Wing* (J661B) records a single copy (PL), and a second copy surfaced at auction in 1967 but this was lacking illustrations and sold with-all-faults. In this form the work was re-issued in 1660, and 1666, after which Jenner's stock was taken over by John Garret who continued its publication under the title Albert Durer Revived, (1679, 1680, 1685, and 1698).' If this edition did not have any plates, then it had only a title page with its verso and 20 pages of text.
Spelman also suggests that there was an earlier edition, published by Compton Holland in 1616–1620. He refers to the frontispiece with the portrait of Durer engraved by Francesco Delaram: 'All that has survived of this first printing is the title-page (examples of which are preserved in the British Library and the Huntington [Library, Glasgow]).' Spelman is probably referring to the portrait of Albrecht Dürer. Pl. [14] in the edition London 1652 and pl. [7] in the edition London 1679 have in the lower left: 'Compton Holland excudit'.
3 –
Hand-colouring
4 –
Drawing / Painting
NOT SEEN
In: OCLC; *Wing 1972–1988*: no. 661B.

A book of drawing, limning, washing or colouring of maps and prints: and the art of painting, with the names and mixtures of colours used by the picture-drawers. Or, the young-mans time well spent. In which, he hath the ground-work to make him fit for doing any thing by hand, when he is able to draw well. By the use of this work, you may draw all parts of a man, leggs, armes, hands and feet, severally, and together. And directions for birds, beasts, landskips, ships, and the like. Moreover you may learn by this tract, to make all sorts of colours; and to grinde and lay them: and to make colours out of colours: and to make gold and silver to write with. How also to diaper and shadow things, and to heighthen them, to stand off: to deepen them, and make them glister. In this book you have the necessary instruments for drawing, and the use of them, and how to make artificiall pastels to draw withall. Very usefull for all handicrafts, and ingenuous gentlemen and youths / [Francis Delaram, Robert Vaughan scu.]. - London : printed by M. Simmons, for Thomas Jenner, 1652. - 40 p. : front., [19] pl. ; c. 28 cm.

§ The plates are attributed to Robert Vaughan because of the name 'Vaughan' underneath the frontispiece and in plate [12]. Comparing the plates at least three different styles of drawing can be recognised.

Pl. [14] is numbered '9' in the lower left and has in the lower right 'Compton Holland excudit', Compton being the presumed publisher of the first edition; see the edition of 1679.

The order of the plates is different in later editions.

Title description after digital scan.

In: DBI-VK; *Levis 1912*: 25; NUC–1956; OCLC; *Wing 1972–1988*: no. 875A.

A book of drawing, limning, washing or colouring of maps and prints, and the art of painting, with the names and mixtures of colours used by the picture-drawers. Or, the young-man's time well spent. In which, he hath the ground-work to make him fit for doing anything by hand, when he is able to draw well. By the use of this work, you may draw all parts of a man, leggs, armes, hands and feet, severally, and together. And directions for birds, beasts, landskips, ships, and the like. Moreover you may learn by this tract, to make all sorts of colours; and to grinde and lay them: and to make colours out of colours: and to make gold and silver to write with. How also to diaper and shadow things, and to heighthen them, to stand off: to deepen them, and make them glister. In this book you have the necessary instruments for drawing, and also the use of them, and how to make artificiall pastels to draw withall. Very usefull for all handicrafts, and ingenuous gentlemen and youths / [Francis Delaram, Robert Vaughan scu.]. - London : printed by M. Simmons, for Thomas Jenner, 1660. - [5], 20 p. : front., [19] pl. ; fol.

NOT SEEN

In: BL; *Levis 1912*: 25; NUC–1956; *Wing 1972–1988*: nos. 663 (2×), 875B (2×), B3705ACA (with differences between the titles).

A book of drawing, limning, washing or colouring of maps and prints. And the art of painting, with the names and mixtures of colours used by the picture-drawers. Or, the young-mans time well spent. In which he hath the ground-work to make him fit for doing any thing by hand, when he is able to draw well. By the use of this work, you may draw all parts of a man, leggs, armes, hands and feet, severally and together. And directions for birds, beasts, landskips, ships, and the like. Moreover, grounds to lay silver or gold upon; and how silver or gold shall be laid or limned upon size; and the way to temper gold and silver, and other mettals, and divers kinds of colours, to write, or to limne withal upon vellum, parchment, or paper, and how to lay them upon the work which thou intendest to make; and how to varnish it when thou hast done. How also to diaper and shadow things, and to highten them, to stand off: to deepen them, and make them glister. In this book you have the necessary intruments for drawing, and the use of them; and how to make artificial pastiles to draw withal. Very useful for all handicrafts, and ingenuous gentlemen and youths / [Francis Delaram, Robert Vaughan scu.]. - London : printed by M. Simmons, for Thomas Jenner, 1666. - 20 p. : 20 pl. ; 30 cm.

§ *Levis*: 'the pages of text are numbered from 1 to 20, the alternate pages containing the illustrations being unnumbered. The imprint is the same as in the edition of 1652'.

Title description after microfilm.

In: BL; *Levis 1912*: 25; NUC–1956; OCLC; *Wing 1972–1988*: no. 875C.

Albert Durer revived: or, a book of drawing, limning, washing or colouring of maps and prints: and the art of painting, with the names and mixtures of colours used by the picture-drawers. With directions how to lay and paint pictures upon glass: or, the young man's time well spent ... In this book, you have the necessary instruments for drawing, and the use of them; and how to make artificial pastiles to draw withall. And also directions, how to draw with Indian Ink: wherein you have also Mr. Hollar's receipt for etching, with instructions how to use it ... [etc.] / [Francis Delaram, Robert Vaughan scu.]. - London : H. Hills, 1675. - [2?], [22?] p. : [20] pl. ; 2º.

MIP: pp. 20–22.

§ This is the first edition with information about etching (pp. 21–22).

1 –

Line Etching

3 –

Hand-colouring

4 –

Drawing / Painting

NOT SEEN

In: OCLC.

Albert Durer revived: or, a book of drawing, limning, washing or colouring of maps and prints: and the art of painting, with the names and mixtures of colours used by the picture-drawers. Or, the young-mans time well spent. In which he hath the g[r]ound-work to make him fit for doing any thing by hand, when he is able to draw well. By the use of this work, you may draw all parts of a man, leggs, armes, hands and feet, severally and together. And directions for birds, beasts, landskips, ships, and the like. Moreover, grounds to lay silver or gold upon; and how silver or gold shall be laid or limned upon size, and the way to temper gold and silver, and other mettals, and divers kinds of colours, to write, or to limne withal, upon vellume, parchment, or paper, and how to lay them upon the work which you intend to make; and how to varnish it, when you have done. How also to diaper and shadow things, and to highten them, to stand off: to deepen them, and make them glister. In this book, you have the necessary instruments for drawing, and the use of them; and how to make artificial pastiles to draw withall. And also directions, how to draw with Indian ink: wherein you have also Mr. Hollars receipt for etching, with instructions how to use it. Very useful for all handicrafts, and ingenuous gentlemen and youths / [Francis Delaram, Robert Vaughan scu.]. - London : printed by S. and B. Griffin, for John Garrett, [1679–1680?]. - [2] p., fol. 1–20, p. 21–22 : front., [19] pl. ; 30–32 cm.

Supplier: title page.

MIP: pp. 20–22.
Stocklist: p. [1] at the beginning, p. 22.
§ This edition is not dated, date after *Levis*. It seems that this edition was published after the edition of Hills in 1675, because the following editions of 1685, 1689 and 1718 cite Garret as the publisher.
All texts on the verso sides, all prints on the recto sides, with two additional pages (pp. 21–22) about Line Etching.
The collation is as follows: the title page is on the recto side of the first folium and has a blank verso side. The portrait of Albrecht Dürer is printed on the recto side of the second folium, its verso side is numbered '1', after which follow nineteen more prints all on recto sides with texts on the verso sides. The verso sides of the third to the twenty-first folium are numbered 2–20. The twenty-second folium is numbered '21' on its recto side and '22' on its verso side and is therefore counted as two pages (pp. 21–22).
The text in the address of the frontispiece is: 'Iosef Rotenhamer pinxit Francisco De Laram sculpsit. A Booke of the Art of Drawing according to ye order of Albert Durer, Jean Cozijn and other excellent Picture-makers: describing ye true proportions of Men, women & Children. Are to bee sould by Thomas [Jenner?] ac[...].'
The information is copied, with differences in spelling, after **Academia italica** [No. 003] and can also be found in **English academy** [No. 091] and **Excellency** [No. 098]. Vice versa some texts in **Book of drawing** [No. 040] are copied in **Academia italica** [No. 003].
Plate [6] is number '9' in the lower left and in the lower right 'Compton Holland excudit'; see the edition of 1652.
Title description after microfilm.
1 –
Line Etching
2 –
Copper
3 –
Hand-colouring
4 –
Drawing / Painting
In: BL; *Hind 1963-1*: 395; *Levis 1912*: 25–26; NUC–1956; OCLC; *Wing 1972–1988*: nos. 875D, 875E.

040.7

Albert Durer revived: or, a book of dravving, limning, washing or colouring of maps and prints: and the art of painting, with the names and mixtures of colours used by the picture-drawers. With directions how to paint pictures on glass. Or, the young-mans time well spent. In which he hath the ground-work to make him fit for doing any thing by hand, when he is able to draw well. By the use of this work, you may draw all parts of a man, leggs, armes, hands and feet, severally and together. And directions for birds, beasts, landskips, ships, and the like. Moreover, grounds to lay silver or gold upon; and how silver or gold shall be laid or limned upon size, and the way to temper gold and silver, and other mettals, and divers kinds of colours, to write, or to limne withal, upon vellume, parchment, or paper, and how to lay them upon the work which you intend to make; and how to varnish it, when you have done. How also to diaper and shadow things, and to highten them, to stand off: to deepen them, and make them glister. In this book, you have the necessary instruments for drawing, and the use of them; and how to make artificial pastiles to draw withall. And also directions, how to draw with Indian ink: wherein you have also Mr. Hollars receipt for etching, with instructions how to use it. Very useful for all handicrafts, and ingenuous gentlemen and youths / [Francis Delaram, Robert Vaughan scu.]. - London : printed for John Garrett, 1685. - [2?], 22 p. : [20] pl. ; 31 cm.
MIP: pp. 20–22.
Stocklist: p. 22.
§ *Levis*: 'Near the bottom of page 20 is "Mr. Wenceslaus Hollar's ground for Etching in Copper or Brass, with his directions how to use it." This continues through page 21 and top of page 22. On page 22 there is also a section entitled "How to make hard Varnish for Etching with Aqua Fortis." The last two-thirds of page 22 contain a catalogue of maps and pictures printed and sold by John Garrett.' 'It will be noted ... that the word *Brasse*, in the Hollar item, is, in the 1685 edition, changed to *Brass*.'
NOT SEEN
In: COPAC; *Levis 1912*: 555–556; NUC–1956; *Wing 1972–1988*: no. 875F.

040.8

Albert Durer revived: Or, a book of drawing, limning, washing, or colouring of maps and prints: And the art of painting, with the names and mixtures of colours used by the picture-drawers. With directions how to lay and paint pictures upon glass. Or, the young-man's time well spent. In which he hath the ground-work to make him fit for doing any thing by hand, when he is able to draw well. By the use of this work you may draw all parts of a man, legs, arms, hands, and feet, severally and together. And directions for birds, beasts, landskips, ships, and the like. Moreover, grounds to lay silver or gold upon, and how silver and gold shall be laid or limned upon size, and the way to temper gold and silver, and other mettals, and divers kinds of colours, to write, or to limn withal, upon vellum, parchment, or paper, and how to lay them upon the work which you intend to make, and how to varnish it when you have done. How also to diaper and shadow things, and to highten them, to stand off: to deepen them, and make them glister. In this book you have the necessary instruments for drawing, and the use of them, and how to make artificial pastils to draw withal. And also directions how to draw with Indian ink: Wherein you have also Mr. Hollars receipt for etching, with instructions how to use it / [Francis Delaram, Robert Vaughan scu.]. - London : printed by I. Dawks, for John Garrett, [1697]. - [1], 21, [1] p. : front., [19] pl. ; [...] cm.
MIP: pp. 20–21.
Stocklist: p. [1] at the beginning, [1] at the back.
§ Undated, date after *Wing*.
The stocklist fills p. [1] at the end, which is the verso of p. 21.
Audience, p. [1] at the beginning: 'Very useful for all handicrafts, and ingenuous gentlemen and youths.'
Title description after digital scan of microfilm.
In: *Wing 1972–1988* (CD-ROM, 1996): no. A875FA.

040.9

Albert Durer revived: or, a book of drawing, limning, washing or colouring of maps and prints: and the art of painting, with the names and mixtures of colours used by the picture-drawers. Or, the young-mans time well spent. In which he hath the ground-work to make him fit for doing any thing by hand, when he is able to draw well. By the use of this work, you may draw all parts of a man, leggs, armes, hands and feet, severally and together. And directions for birds, beasts, landskips, ships, and the like. Moreover, grounds to lay silver or gold upon; and how silver or gold shall be laid or limned upon size, and the way to temper gold and silver, and other mettals, and divers kinds of colours, to write, or to limne withal, upon vellume, parchment, or paper, and how to lay them upon the work which you intend to make; and how to varnish it,

when you have done. How also to diaper and shadow things, and to highten them, to stand off: to deepen them, and make them gl ister. In this book, you have the necessary instruments for drawing, and the use of them; and how to make artificial pastiles to draw withal l. And also directions, how to draw with Indian ink: wherein you have also Mr. Hollars receipt for etching, with instru ctions how to use it / [Francis Delaram, Robert Vaughan scu.]. - London : for John Garrett, 1698. - 22 p. : [front.?], [19?] pl. ; 2º.
NOT SEEN
In: BLO; NUC–1956; *Wing 1972–1988*: no. 875G.

040.10

Albert Durer revived: or, a book of drawing, limning, washing, or colouring of maps and prints: and the art of painting, with the names and mixtures of colours used by the picture-drawers. With directions how to lay and paint pictures upon glass. Or, the young-man's time wel spent. In which he hath the ground-work to make him fit for doing any thing by hand, when he is able to draw well. By the use of this work, you may draw all parts of a man, legs, arms, hands, and feet, severally and together. And directions for birds, beasts, landskips, ships, and the like. Moreover, grounds to lay silver or gold upon, and how silver or gold shall be laid or limned upon size, and the way to temper gold and silver, and other mettals, and divers kinds of colours, to write, or to limn withal, upon vellum, parchment, or paper, and how to lay them upon the work which you intend to make, and how to varnish it when you have done. How also to diaper and shadow things, and to highten them, to stand off: to deepen them, and to make them glister. In this book, you have the necessary instruments for drawing, and the use of them, and how to make artificial pastils to draw withall. And also directions how to draw with Indian ink: wherein you have also Mr. Hollars receipt for etching, with instructions how to use it. Very useful for all handicrafts, and ingeneous gentlemen and youths / [Francis Delaram, Robert Vaughan scu.]. - London : printed by I. Dawks, for John Garrett, [1705?]. - [1], 21 fol. : front, [19] pl. ; 32 cm.
MIP: fol. 20v-21r.
Supplier: fol. 1r.
Stocklist: fol. 1r, 21v.
§ The volume now contains 22 folia. Fol. [1]r is the French title, fol. [1]v has the frontispiece, fol. 1r is the title page, fol. 1v is the first page of text and the number of the folium is at the top edge, as it is on all verso sides, except on fol. 21, where it is found on the recto side. All plates on the recto sides, all texts on the verso sides and on fol. 21r.
The plates have numbers which do not relate to the text, thus have been used before.
The spelling on the title page has been changed a little.
It is not clear whether the copies ESTC and NSUG are of the same edition. The NSUG copy is on good quality paper with all impressions dark, although all plates were run through the press twice as evidenced by the double lines visible on every print. The present edition is therefore considered to have been printed earlier than the following undated edition.
In: ESTC: no. t153835; NSUG.

040.11

Albert Durer revived: or, a book of drawing, limning, washing, or colouring of maps and prints: and the art of painting, with the names and mixtures of colours used by the picture-drawers. With directions how to lay and paint pictures upon glass. Or, the young-man's time wel spent. In which he hath the ground-work to make him fit for doing any thing by hand, when he is able to draw well. By the use of this work, you may draw all parts of a man, legs, arms, hands and feet, severally and together. And directions for birds, beasts, landskips, ships, and the like. Moreover, grounds to lay silver or gold upon, and how silver or gold shall be laid or limned upon size, and the way to temper gold and silver, and other metals, and divers kinds of colours, to write, or to limn withal, upon vellum, parchment, or paper, and how to lay them upon the work which you intend to make; and how to varnish it when you have done. How also to diaper and shadow things, and to highten them, to stand off; to deepen them, and to make them glister. In this book you have the necessary instruments for drawing, and the use of them, and how to make artificial pastils to draw withall. And also directions how to draw with Indian ink: wherein you have also Mr. Hollar's receipt for etching, with instructions how to use it. Very useful for all handicrafts, and ingeneous gentlemen and youths / [Francis Delaram, Robert Vaughan scu.]. - London : printed for John Garrett, [1710?]. - 21, [1] p. : front., [19] pl. ; 32 cm.
Stocklist: fol. 1r, 21v.
Supplier: fol. 1r.
§ ESTC: 'With a half-title. - Text printed on versos only'.
It is not clear whether the copies ESTC and NSUG are of the same edition.
The plates have numbers which do not relate to the text, thus have been used before.
The collation is the same as with the edition of 1705, except that the line width is now 152–154 mm compared to 148–151 mm in the earlier edition. The effect is that at the end of p. 21 there is 5.5 cm. of white left instead of the text running into the bottom of the page.
Pl. [2] of copy NSUG is pasted over with a second copy of the same plate.
In: ESTC: no. t153834; NSUG.

040.12

Albert Durer revived: or, a book of drawing, limning, washing or colouring of maps and prints: and the art of painting ... Or, the young-man's time well spent ... [etc.] / [Francis Delaram, Robert Vaughan scu.]. - London : printed for John Garrett, 1718. - [1], 21, [1] p. : [20] pl. ; 34 cm.
Advertisement: p. [1] at the back.
§ *Levis*: 'It has a short title on the back of which is the frontispiece portrait of Dürer, followed by title-page, on the back of which is page 1, followed by 19 plates, on the back of each being a numbered page - 2 to 20 - followed by page 21 and an unnumbered page of advertisement.'
NOT SEEN
In: *Levis 1912*: 26; NUC–1956.

040.13

Albert Durer revived: or, a book of drawing, limning, washing or colouring of maps and prints: and the art of painting ... Or, the young-man's time well spent ... [etc.] / [Francis Delaram, Robert Vaughan scu.]. - London : printed for Thomas Glass, 1731. - [2] 21, [1] p. : [20] pl. ; 31–32 cm.
§ *Levis*: 'the same as that of 1718'.
NOT SEEN
In: *Levis 1912*: 26; NUC–1956; OCLC.

Borch (Gerard ter)   041.1

Konst om te etsen / Gerard ter Borch [Terborgh]. - Zwolle, [c. 1632]. - [1] fol. ; [c. 31] cm.
§ Title means: The art of etching
Manuscript.
Language: Dutch.

Contains instructions for etching and for printing without a press. Alison McNeil Kettering considered that Ter Borch wrote the instructions himself around the time he started etching in 1632 or slightly later; letter to Mària van Berge-Gerbaud, 16 July 1982.
One folium, written on both sides.
Reprint: 1939 [No. 041.3].
Title description after photocopy and: 1939 [No. 041.3].
1 –
Line Etching
2 –
Copper
3 –
Ink / Rubbing
In: FC-CFL, Ms. ter Borgh G. 490 B, 490 C.

<div align="right">041.2</div>

Konst om te etsen, [with a letter] / Gerard ter Borch [Terborgh]. - Zwolle, [1635]. - [1] bifol. ; [c. 31] cm.
§ Manuscript.
Language: Dutch.
The text of the treatise is a copy of the above text, but in a different hand and possibly written by Ter Borch's daughter Ghesina ter Borch. Gerard ter Borch wrote a letter to his son Gerard Terborgh the Younger, then living in London, on the blank verso of the folded sheet. The hand of the letter is the same as that of the original text.
The letter is dated: 'in zwoll de[n] 3. Julij Nije Stij 1635'.
One bifolium. The text on etching is on fol. [1]r–v, [2]r. Ter Borch's letter is on fol. [2]v.
Reprint: 1939 [041.3].
Title description after photocopy and: 1939 [041.3].
In: FC-CFL, Ms. ter Borgh G. 490 A, 490 D, 490 E.

<div align="right">041.3</div>

Hollandsche etsrecepten vóór 1645 / J[an] G[errit] van Gelder.
In: Oud Holland. - Vol. 56 (1939). - P. 113–124.
MIP: Konst om te etsen. - P. 121–123.
English summary: p. 124.
With literature.
§ Discussed together with Gerard ter Brugghen's treatise, see: **Brugghen** (Amsterdam 1616) [No. 050].
In: KB; RMA; UBA; UBL-KHI.

<div align="right">**Bosse** (Abraham)   042.1</div>

Lettres patentes qui permettent aux sieurs Abraham Bosse graveur en taille douce, et Charles delafont[aine] d'jmprimer sur toutes estoffes de soje, papier, velin parchemin, cuir, etc. - Paris, 6 Janvier 1637. - [4] fol. ; [c. 30] cm.
§ Title means: Letters patent who permit Mrs. Abraham Bosse engraver, and Charles delafont[aine] the printing on all kinds of silk, paper, vellum, parchment, leather etc.
Manuscript.
Language: French.
The ms. says "Charles delafont" and "Charles dela font". According to *Join-Lambert 2004* (pp. 320, 324) this is 'Charles de La Fontaine' without further identification or references. TB gives a: Lafontaine, Charles de, fl. 1640–1650 in Brussel as weaver.
The patent concerns intaglio printing in colours, with gold and silver borders of 'almanacs in leaves or placards, theses, posters, gifts, screens, fans, and all images as well as of devotion as other figures who are found by this manner befitted with all of their true colours, lights and shadows' etc.
Without any technical details on the printing process, which, however, Bosse gives in his manual; **Bosse** (Paris 1645) [No. 042.2]: 72–73.
For a transcription: Paris: Morancé, 1924 [No. 042.32].
Title description based on microfilm of BNP.
1 –
Line Engraving / Line Etching
3 –
Colour / Gold / Leather / Multiple-plate Printing / Parchment / Printing Polychrome / Silver / Textile
4 –
Woodcut
In: BNP, Coll. Delamarre, Ms. Fr. 21732, fol.138r-141v; AN, Autres series, 06.01.1637.XIa 8653, fol. 83.

<div align="right">042.2</div>

Traicté des manieres de graver en taille douce sur l'airin. Par le moyen des eaux fortes, & des vernix durs & mols. Ensemble de la façon d'en imprimer les planches & d'en construire la presse, & autres choses concernans lesdits arts / par A[braham] Bosse ; [etch. by Abraham Bosse]. - [1st ed.]. - Paris : chez ledit [Abraham] Bosse; De l'Imprimerie de Pierre Des-Hayes, 1645. - [6], 75 p. : front., [2], 16 pl. ; 16–18 & 20 cm.
Contents: p. 6.
Suppliers: pp. 5, 11.
Specimens: pl. 4, 8.
§ Title means: Treatise of the manner of engraving in copper. By means of acids and hard and soft grounds. Together with the way of printing the plates and constructing the press, and other things concerning these arts
Title on the frontispiece: Manieres [de] graver a leavforte en Cuiure par A. Bosse. Ensemble den Imprimer les planches et den Construire la Presse. A.Paris. chez led' Bosse, en lisle du Palais. 1645. auec priuilege
Title on the engraved title page: Traite des manieres de graver en taille dovce svr lairain Par le moyen des eaves fortes et des vernix dvrs et mols ensemble de la Façon d'en Imprimer les Planches, et d'en Construire la Presse par A. Bosse de la ville de Tours, graueur en taille douce. A Paris M.DC.XLV. Avec privilege dv Roy
None of the plates are signed, but they will probably all have been etched by Bosse himself.
Address of the printer, p. 75: 'A Paris, De l'Imprimerie de Pierre Des-Hayes, ruë de la Harpe à la Roze rouge'.

Address of Bosse, p. [1]: 'A Paris, Chez le dit Bosse, en l'Isle du Palais, à la Roze rouge, deuant la Megisserie'.

The royal privilege is dated, p. 8: 'saint Germain en Laye le 3. Nouembre 1642. … verifiées & registrés … le dousiesme jour de May mil six cent quarante-trois'. This is a general privilege concerning the prints Bosse wants to publish.

The text is the same throughout all copies, although the collation of the various copies differs. Copy HAB has five blank pages between *Aux amateurs* and *Avant propos*. These five pages originally belonged to the first quire of twelve pages, which gives the collation: [12], 75 p.

All copies have the plates printed on recto sides of folia that are separately printed and bound with the text. The copies RMA, *Schlosser* and the copy of the 1979 reprint have plates 5 and 6 printed double on their own versos, giving the formula: 1/-, 2/-, 3/-, 4/-, 5/5, 6/6, 7/- 8/-, 9/-, 10/-, 11/-, 12/-, 13/-, 14/-, 15/-, 16/-. Copies MBvB (2×) and SPKA have more plates printed twice, giving the formula: 1/-, 2/-, 3/-, 4/-, 5/5, 6/6, 7/- 8/-, 9/9, 10/10, 11/11, 12/12, 13/13, 14/14, 15/15, 16/16. Copies BNL, DBSM, HAB, KCA and NSUG have the formula: 1/2, 3/-, 4/-, 5/5, 6/6, 7/-, 8/-, 9/10, 11/12, 13/14, 15/16.

Copies on normal paper are 16–18 cm high and 12 cm wide. Copies ULC-Pepys Library and MBvB (1×) are printed on large paper and are 20 cm high and 13.5–14 wide.

This treatise is aimed at print lovers (*Aux amateurs*) who would like to know about Bosse's craft or perhaps would even like to try their hand at it (p. [3]–[5]). Bosse asks professional engravers for comments and additions.

For a discussion on the influence of this manual and a pedigree of its editions, translations, reprints and manuscript copies, see above: Manuals and their Influence – Abraham Bosse, p. 419.

Integral transcription: Bologna 1937 [No. 042.33].

Photomechanical reprints: Paris 1979 [No. 042.38]; Kanazawa 2004 [No. 042.41].

1 –
Échoppe / Line Engraving / Line Etching
2 –
Brass / Copper
3 –
Counterproof / Ink / Monotype / Multiple-plate Printing / Paper / Press / Printing in Black / Printing Monochrome / Printing Polychrome
5 –
Aesthetics / Art History

In: *Bigmore & Wyman 1880–1886* 1: 72; BL (2×); *Blas Benito 1994*: 67; BLBS; *Blum 1924*: nos. 403–421; BN (2×); BNL; BNM; DBI-VK; DBSM; *Figueras Ferrer 1992*: 1032; HAB; KBR; KBS; KCA; *Levis 1912:* 20–21, 38; LIBRIS (2×); MBvB (2×); MMGA; MET; RISD-Museum of Art; NCC; NSUG; NUC–1956, vol. 68 (13×); NUC 1987–1992; OCLC (14×); ÖNB; PUL; RMA; RSL; SBB; *Singer & Strang 1897*: no. 9; *Schlosser 1992*; SPKA; MMAT; UBA; ULC-Pepys Library.

042.3

Traicté des manieres de graver en taille douce / Abraham Bosse. - [S.l.], [1650–1700].
§ Manuscript.
Language: French.
Sotheby: 'an early manuscript copy of the 1645 edition [No. 042.2], text only'.
NOT SEEN
In: Sotheby's, New York, auction catalogue for 17–18 June 1992, The Leonard B. Schlosser Collection: no. 444.

042.4

Traité des manieres de grauer en taille douce sur l'airain par le moyen des eaues fortes et des vernix durs et mols / par A[braham] Bosse. - [S.l.], [1645–1725]. - 75 p. : [4] colour drawings ; 20 cm.
§ Manuscript.
Language: French.
Levis 1912: 21: 'I have a curious French manuscript copy of the most important part of Bosse's book, with watercolour copies of four of the plates. It is not dated, but the paper and binding show it to be of the seventeenth or early eighteenth century.'
NUC–1956: 'Manuscript copy of the most important part of Bosse's work, with water-color copies of 4 of the plates. Handwriting of 17th or early 18th cent. Bookplate of Howard C. Levis.' Probably copy of No. 042.2.
NOT SEEN
In: LC-RC: no. 1607, ms. no. 21; *Levis 1912*: 21; NUC–1956, vol. 68.

042.5

Traicté des manieres de graver en taille dovce sur l'airin. Par le moyen des eaux fortes & des vernix durs & mols. Ensemble de la façon d'en imprimer les planches & d'en construire la presse, & autres choses concernans lesdites arts = Tractaet in wat manieren men op root kooper snijden ofte etzen zal. Door de middel der stercke wateren, ende harde- en zachte vernissen, ofte gronde. Als mede de manieren der zelve plaeten te drucken, de pars te maecken, en andere dinghen, behelzende de zelve konsten / par A[braham] Bosse = i[n] 't fransch beschreven door A[braham] Bosse ; in 't nederduyts overgezet door P[ieter] H[olsteyn]. - [S.l.], [1662–1700]. - 156 fol. : [19] drawings ; 19 cm.
§ Manuscript.
Languages: French, Dutch.
Fol. 1–88: transcription of the edition Paris 1645 [No. 042.2], with drawings after the 19 pl.
Fol. 89–156: transcription of the edition Amsterdam 1662 [No. 042.26].
The two texts are in two different hands, but the kind of paper is the same throughout the volume.
Title description after information by the owner of the ms. and *Janssen 2011*: 301–304.
This is the same description as [No. 042.27].
NOT SEEN
In: Priv.Coll.

042.6

Traité des manieres de graver en taille-douce sur l'airain, par le moyen des eaux fortes & des vernis durs & mols. D'imprimer les planches, & de construire la presse / par A[braham] Bosse ; [etch. by Abraham Bosse]. - [2nd ed., 1st issue] Augmenté de la nouvelle maniere / dont se sert [Sébastien] Le Clerc ; [F. Ertinger scu.]. - Paris : chez Pierre Emery, 1701. - [10], 70, [2] p. : front., 16, [1] pl. ; 19–19.5 cm.
List of publications by Bosse: p. [2] at the beginning.
Specimens: pl. 4, 8.
Contents: p. [1] at the back.

§ The text of the second edition is almost the same as that in the first edition. The text has been reset with adapted spelling. Without Bosse's preface. Added is a paragraph with an extra plate (opp. p. 31) etched by Ertinger about how Le Clerc etches his plates in a tray (pp. 31–32), a technique not originally described by Bosse. With the same frontispiece, except that the strip with the text is cut off; the top dots of the letters still show. Missing are the etching *Aux amateurs* and the engraved title page.

The page numbers between '50' and '70' were deformed and are easily misread.

Every plate in the KCA copy has a (partly) offset of the plate following on its verso. This means the plates were gathered in their numerical order shortly after printing and kept like that until bound in this copy opposite their related pages.

In: *Bigmore & Wyman 1880–1886* 1: 72; *Blas Benito 1994*: 67; BN; DBI-VK; DBSM; *Figueras Ferrer 1992*: 1032; KCA; MET; NCC; NSUG; NUC–1956, vol. 68 (2×); ÖNB; *Peddie 1962*, vol. 1; RMA; *Singer & Strang 1897*: no. 29 (?); UBL-KHI.

042.7

Traité des manieres de graver en taille-douce sur l'airain, par le moyen des eaux fortes & des vernis durs & mols. D'imprimer les planches, & de construire la presse / par A[braham] Bosse ; [etch. by Abraham Bosse]. - [2nd ed., 2nd issue] revû & augmenté d'une nouvelle maniere de se servir desdites eaux fortes / par [Sébastien] le Clerc ; [F. Ertinger scu.]. - Paris : chez Pierre Aubouïn et Charles Clousier, 1701. - [6], 70, [2] p. : front., [2], 16 pl. ; 19 cm.

§ Same edition as: Paris : chez Pierre Emery, 1701; but different issue published by: Pierre Aubouïn en Charles Clousier.

Pierre Emery and Charles Clousier lived in the same street. Emery's address: Quay des Augustins, au coin de la ruë Gille-coeur à l'Ecu de France; Clousier's address: Quay des Augustins à la Croix d'Or.

Collation after NUC and photo of title page of copy LC.

NOT SEEN

In: *Blas Benito 1994*: 67; LC; NUC–1956, vol. 68 (8×); OCLC (3×); *Singer & Strang 1897*: no. 29 (?).

042.8

De la maniere de graver a l'eau forte et au burin. Et de la gravûre en maniere noire. Avec la façon de construire les presses modernes, & d'imprimer en taille douce / par Abraham Bosse ; préface de l'editeur [Charles-Nicholas Cochin *fils*] ; C[harles] N[icolas] Cochin filius inv. ; [etch. by Abraham Bosse], [vign. by] F. Ertinger, G. Fessard, Soubeyran sculp. - Nouvelle [3rd] éd. / rev., cor. & augm. du double [par Charles-Nicholas Cochin fils]. - Paris : chez Charles-Antoine Jombert, 1745. - xxxii, 186, [6] p. : front., [1], 19 pl., all folding, [4] vign. ; 19.5–21 cm.

Contents: p. xxv.
Directions to the bookbinder: p. xxxij.
Specimens: pl. 4, 8.
Suppliers: p. 62.
Index: p. 163.
Stocklist: p. [1].
With literature.

§ The editor Cochin *fils* is not mentioned here, p. xi: 'Ces augmentations ... étant composées par un fort habile homme dans cette profession.' His name is given in the fourth edition, p. xl–xii, n. *: 'M. Cochin'. This is Charles Nicolas Cochin *fils*, because his father died in 1754. Cochin *fils* modernised the content and the spelling of the text.

Permission for publication (*Approbation*) by Montcarville, p. xxix: '7. Février 1743'.

Royal privilege, p. xxix–xxxii: 'Donné à Versailles le vingt-sixiéme jour du mois d'Avril, l'an de grace mil sept cens quarante-trois'.

Registration, p. xxxij: 'A Paris le 23 Mai 1743'.

The plate *Aux amateurs* is back. Although wear is visible, most original plates are kept: frontispiece, *Aux amateurs*, pl. 1–8, 10–11 and 16. Pl. 9 is the one by Ertinger added to the second edition. Pl. 12–13 are added and concern mezzotint. Pl. 14–15 and 17–19 are added and concern the printing press. The plates for the construction of the roller press are changed, because the design of the roller press is modernised (pp. vii–ix). Missing are the measures of the parts of the press, just a scale is given. The vignettes are small etchings printed at the beginning of every chapter showing the activities described in the following chapter.

A footnote on pp. xix–xx states that the first edition was published in '1643'. This mistake is repeated in the fourth edition, as well as in all later translations of the third edition, and is copied in all the literature basing itself on information in the third and fourth editions.

Intended audience, p. 3: 'pour les Commençans, qui leur faciliteront les moyens de se perfectionner dans la Pratique de ce bel Art'.

The etching ground recipes on pp. 50–52 are after **Browne 2** (London 1669) [No. 049]: 99, 105, 106.

Information on engraving and the appearance of the design (pp. 96–117) is almost literally copied after **Le Comte** (Paris 1699–1701) [No. 181] 1: 138–156.

1 –
Échoppe / Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Counterproof / Ink / Monotype / Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Aesthetics / Art History

In: *Bigmore & Wyman 1880–1886*, 1: 72; BL; *Blas Benito 1994*: 67; BLBS; BN (2×); BNL; BNM; CCB; DBI-VK; BDS; DBSM; *Figueras Ferrer 1992*: 1032; KB; KCA; NCC; NUC–1956, vol. 68 (13×); OCLC (21×); Priv.Coll. (2×); RAL; RMA; SBB; *Singer & Strang 1897*: nos. 37–38; UBL-PK; UBU; ULC.

042.9

[Notes on etching]. – [S.a.], [1745–1800].
In: **Bosse** (Paris 1745) [No. 0428], throughout the text.
§ Manuscript.
Language: French, Portuguese.
Concerns notes in the margins of the printed text on etching ground and the construction of the press.
1 –
Line Etching
3 –
Press
In: Priv.Coll.

[Notes on etching and printing] / J.C. Gaal du Waye [?]. - [S.l.], 1851.
In: **Berthiaud** (Paris 1837) [No. 029.1]: between pp. 58 and 59, 186 and 187.
§ Manuscript.
Language: French.
Notes after **Bosse** (Paris 1745) [No. 042.8].
Owner's inscription of J.C. Gaal du Waye (?) on front flyleaf recto.
This is the same text as described under **Berthiaud** [No. 029.2].
1 –
Line Etching
3 –
Printing in Black
In: UBA, Zaal Boekhandel: 278.

De la maniere de graver a l'eau forte et au burin, et de la gravure en maniere noire. Avec la façon de construire les presses modernes, & d'imprimer en taille-douce / par Abraham Bosse ; [ed. by Charles Nicolas Cochin fils] ; [Louis Marin] Bonnet, C[harles] N[icolas] Cochin filius inv. ; [etch. by Abraham Bosse], [vign. by] F. Ertinger, G. Fessard, Soubeyran sculp. - Nouvelle [4th] éd., augm. de l'impression qui imite les tableaux, de la gravûre en maniere de crayon, & de celle qui imite le lavis. - Paris : chez Charles-Antoine Jombert, 1758 [sic! = 1769 or later]. - xxxii, 205, [3] p. : front., [4] vign., [1], 1–13, XIV–XV, 16–21 pl. ; 20–21 cm.
Contents: p. xxviii.
Subject index: p. 183.
Specimens: pl. 4, 8.
Directions to the bookbinder: p. [3].
With literature.
§ The royal privilege, p. [1], of 26 April 1743 and the registration of 23 Mai 1743 are the same as in the 1745 edition.
Permission for publication (*Approbation*) by Montcarville, p. [1]: 'le 12 Mars 1758'.
Contains the text of the third edition reset with some minor spelling corrections. Added are paragraphs on printing in colour, chiaroscuro woodcut, crayon engraving and aquatint. Le Blon's printing technique (pp. 128–133) is copied and summarised after **Le Blon** (Paris 1756) [No. 180.2]: 88–107. Jean Robert's colour printing process (p. 150) is copied after **Le Blon** (Paris 1756) [No. 180.2]: 128–130. The text on crayon engraving (pp. 133–140) is copied from *Diderot & D'Alembert 1751–1781*, p. 133: "Cet article de la gravûre en manière de crayon est extrait du *recueil de planches sur les sciences & les arts*, quatriéme livraison [= 1767], *article* GRAVURE [pl. VIII]. Un Artiste célèbre & praticien dans ce genre de travail [= Louis Marin Bonnet], a bien voulu le relire avec attention & se charger de la gravûre des deux planches [pl. XIV–XV, 'Bonnet Sculpsit'] que nous joignons ici pour l'intelligence du discours suivant."
The year of publication on the title page is '1758', but several details, such as the reference to **Bonnet** (Paris 1769) [No. 039], show that the treatise was published in 1769 or later; *Hind 1907*.
The same plates are used as in the 1745 edition, added are plates XIV and XV concerning crayon engraving by Bonnet.
1 –
Aquatint / Crayon Engraving / Échoppe / Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Counterproof / Ink / Multiple-plate / Press / Printing / Printing in Black
4 –
Chiaroscuro Woodcut / Woodcut
5 –
Aesthetics / Art History
In: *Bigmore & Wyman 1880–1886*, 1: 72; BL; *Blas Benito 1994*: 67; BLBS; BS; DBI-VK; DBSM; ENS; *Figueras Ferrer 1992*: 1032; KCA; LIBRIS; MET; NCC; NSUG; NUC–1956, vol. 68 (11×); OCLC; *Peddie 1962*, vol. 1; RMA; SBB; *Singer & Strang 1897*: no. 46; UBG.

Kunst-Büchlein handelt von der Radier- und Etzkunst, wie man nemlich mit Scheidwasser in Kupffer etzen, das Scheid- oder Etzwasser, wie auch den harten und weichen Etzgrund machen solle, beneben kurzer Beschreibung, wie man die Kupffer-Platten abdrucken, die Truckerpreße machen, und was sonsten bey dieser Kunst nöthig zu wissen, in acht nehmen solle / erstmahls durch A[braham] Bosse, Kupfferstecher zu Paris, in Französischer Sprach beschrieben ; anjetzo aber uff begehren vieler Liebhaber ins Teutsche befördert durch Georg-Andream Böckler ; [preface by Georg-Andreas Böckler] ; Lobgedicht von H.G.P. [= Georg Philipp Harsdörffer] ; A[braham] Aubry fecit [front.]. Diesem ist angefüget worden ein kunstverständiger Discurs von der edlen Mahlerey / durch einen unbenennten Autorem [= Georg-Andreas Böckler]. - [1st ed.]. - Nürnberg : In Verlegung Paulus Fürsten; gedruckt durch Heinrich Pillenhofer, 1652. - [20], 155, [5] p. : front., 16, [2] Fig. ; 16–16.5 cm.
MIP: pp. [1]–[20], 1–124 : front., 16, [1] Fig.
Contents: p. [1] at the back.
Directions to the bookbinder: p. [5] at the back.
§ Title means: Art booklet concerning the art of etching
Title on the frontispiece: Manier Mit Scheidwasser in Kupffer zu etzen. durch A. Bosse: und ein Discurs von der Mahlereij. Auß dem Frantzößischen ins Teutsche befördert durch Georgium Andream Böcklern. Aº. 1652 Paul. Fürst Excudit
Translation of the edition: Paris 1645 [No. 042.2].
The dedication is dated, p. [7]: 'Geben Franckfort am Mäyn, den 1. Aug. Anno 1651.'
The *Figuren* are engravings. The *Figuren* are printed on separate sheets and bound with the text.
Although the German translation is literal, Meynier was rather negative about it (*Eine elende Uebersetzung*) and considered the 1765 translation a better one; **Meynier** (Hof 1804) [No. 208]: 2–3.
1 –
Line Engraving / Line Etching
2 –

Copper
3 –
Counterproof / Multiple-plate Printing / Ink / Press / Printing in Black / Printing Polychrome
4 –
Painting
5 –
Aesthetics / Art History
In: BL; *Blas Benito 1994*: 67; *Börsenverein 1885*: 65; BIBSYS; BS; DBI-VK; DBSM; HAB; KCA; LIBRIS; *Peddie 1962*, vol. 3; PUL; *Singer & Strang 1897*: no. 12.

042.13

Radier-Büchlein, handelt von der Etzkunst, nehmlich: wie man mit Scheidwasser in Kupffer etzen, das Wasser, wie auch den harten und weichen Etzgrund machen solle; beneben kurtzer Beschreibung, wie die Kupfferplatten abzudrucken; die Drucker-Presse zu machen, und was man sonsten darbey in acht zu nehmen hat / erstmals durch Abraham Bosse, in Französicher Sprache beschrieben ; anjetzo aber zum Andernmahl, auff Begehren vieler Liebhaber in Teutscher Sprach heraus gegeben und vermehret: sampt einer Zugabe, von der Herold- Mahl- und Reißkunst, mit darzu-gehörigen Figuren durch Georg[ium] Andream Böcklern ; Vorwort und Dedicatio von Georg-Andreas Böckler ; Lobgedicht von Georg-Philipp Harsdörffer ; A[braham] Aubry fecit [front.]. - Andernmahl [2nd ed.]. - Nürnberg : in Verlegung Paul Fürstens seel. Wittib und Erben ; gedruckt daselbst bey Christoff Gerhard, 1669. - [19] p., p. 0–201, [8] p. : front., 16, [1], [3] Fig. ; 15–18 cm.
MIP: pp. [11]–[19], 0–168 : front., 16, [1] Fig.
Index: p. [1] at the back.
Directions to the bookbinder: p. [8].
§ Title means: Etching booklet, concerns the art of etching
The frontispiece is dated: 'Aº. 1669'.
The introduction is rewritten in 1669: p. [9].
– Appendix 1: Appendix, das ist: Zugabe oder Anhang, handelt von der Herold- Mahl- und Reiß-Kunst; worinnen begriffen, was man bey dem Kupfferstechen, oder in der Etzkunst davon zu wissen vannothen hat. Sampt beygefügten Figuren, und Beschreibung unterschiedlicher Sinnbilder und deren Außlegungen / durch Georg Andreas Böcklern. - P. 129–168 : [2] Fig.
– Appendix 2: Kunstverständiger Discurs, von der edlen Mahlerey / [Georg-Andreas Böckler]. - P. 169–201 : [1] Fig.
In: BS; CCB; DBI-VK; HAB; KCA; MAK 1883, p. 296; NSUG; NUC–1956, vol. 68 (2×); OCLC (2×); ÖNB; *Peddie 1962*, vol. 2; RAA; RKD; *Singer & Strang 1897*: no. 16.

042.14

[Notes on etching]. - [S.l.], [c. 1700]. - [1] fol. ; 15 cm.
In: **Bosse** (Nürnberg 1669) [No. 042.13]: fol. [9]r–v at the back.
§ Manuscript.
Language: German.
Contains three manuscript recipes for etching grounds and one sketch of a wooden roller press.
The three recipes are on fol. [9]r, the sketch of the press is on fol. [9]v.
1 –
Line Etching
3 –
Press
In: RAA, 762, BO: E "1669".

042.15

Abraham Bosses gründliche Anweisung zur Radier-und Etz-Kunst. - Nürnberg : […], 1673. - 8˚.
§ Although the title is found in various bibliographies this is most likely a 'ghost' because no copy could be traced.
NOT PUBLISHED
In: **Bosse** (Dresden 1765) [No. 042.23]: [5]: **Bosse** (Nürnberg 1795–1796) [No. 042.25] 1: III; *Singer & Strang 1897*: no. 19.

042.16

Radier-Büchlein, handelt von der Etzkunst, nehmlich: wie man mit Scheidwasser in Kupffer etzen, das Wasser, wie auch den harten und weichen Etzgrund machen solle; beneben kurtzer Beschreibung, wie die Kupfferplatten abzudrucken; die Drucker-Presse zu machen, und was man sonsten darbey in acht zu nehmen hat / erstmals durch Abraham Bosse, berühmten Kupfferstechern zu Paris, in Französicher Sprache beschrieben ; anjetzo aber zum Drittenmahl, auf Begehren vieler Liebhaber in Teutscher Sprach heraus gegeben und vermehret durch Georg Andream Böcklern ; sampt einer Zugabe, von der Herold- Mahl- und Reißkunst, mit darzugehörigen Figuren durch Georg[ium] Andream Böcklern ; Vorwort und Dedicatio von Georg-Andreas Böckler ; Lobgedicht von Georg-Philipp Harsdörffer ; A[braham] Aubry fecit [front.]. - [3rd ed.]. - Nürnberg : in Verlegung Paul Fürstens seel. Wittib und Erben ; gedruckt daselbst bey Christian Sigm. Froberg, 1689. - [17 or 19] p., p. 0–201, [7 or 8] p. : front., 16, [4] Fig. ; 16–17 cm.
MIP: pp. [1]–[17 or 19], 0–168 : 16, [3] Fig.
Contents: p. [1] at the back.
§ Title on frontispiece: Manier Mitt Scheidwasser in Kupffer zu etzen. durch A: Bosse und ein Discurs von der Mahlereij. Auß dem Frantzösischen ins Teutsche befördert durch Georgium Andream Böcklern. A˚. 1689. A. Aubry fecit
The text has been reset. Added are ten extra recipes for etching grounds: pp. 65–67. The appendix on *Mahlereij* is extended.
The date on the frontispiece is: 'Aº 1689'.
Photomechanical reprints: Darmstadt 1976 [No. 042.36]; Gräfelfing vor München 1977 [No. 042.37].
In: BS; *Börsenverein 1885*: 65; DBI-VK; DBSM; HAB; NSUG; NUC–1956, vol. 70; SBB; UBAB; UBH.

042.17

Abraham Bossens gründliche Anweisung zur Radier- und Etz-Kunst, nehmlich: wie man mit Scheid-Wasser in Kupffer und andern Metallen etzen, das Wasser, wie auch den harten und weichen Etz-Grund bereiten solle; ferner, wie die Kupffer-Platten abzudrucken; die Drucker-Presse zu machen, und was man sonsten dabey in acht zu nehmen hat. Diesem ist als ein Anhang beygefügt: Henri Gautier de Nismes Kunst zu Tuschen / beede aus dem Französischen ins Teutsche übersetzt, mit vielen sonderbaren Anmerckungen vermehrt und hierzu dienlichen Kupffern versehen [by Georg-Andreas Böckler] ; [?] Dehne fe. [front.]. - [1st ed.]. - Nürnberg : bey Peter Conrad Monath, 1719. - [14], 209, [7] p. : front., 16, [4] Fig. ; 16–17.5 cm.

MIP: pp. [1]–[14], 1–174 : front., 16, [3] Fig.

Contents: p. [1] at the back.

§ Title means: Abraham Bosse's thorough directions for the art of etching

Title on frontispiece: Radier und Etz Kunst. Samt einem Discours von der Mahlereij

Contents and text are the same as the edition Nürnberg 1689 (no. 042.16). All *Figuren* are reprinted in the same direction as earlier German originals, except that the lower part of *Figure* [4] is now reversed and the etching with the easels is now a woodcut in reverse of the original. *Figuren* 1–16 are etchings, the [4] additional *Figuren* are two woodcuts and two etchings. The *Figuren* and the text are printed on the same sheets. With two appendices.

– Appendix 1, p. 133: Appendix, Das ist: Zugabe oder Anhang, handelt von der Herold- Mahl- und Reiß-Kunst; worinnen begriffen, was man bey dem Kupfferstechen, oder in der Etz-Kunst davon zu wissen vonnöthen hat. Samt beygefügten Figuren, und Beschreibung unterschiedlicher Sinnbilder und deren Auslegungen / durch Georg. Andreas Böcklern.

– Appendix 2: L'Art de laver, oder: die Kunst zu tuschen, das ist: die allerneueste Manier Vestungen und andere Risse mit gehörigen Farben zu mahlen und zu tuschen. Ferner wird angewiesen, wie man die Farben abreiben, vermischen, Pensel, Schifflein und alles hierzu nöthige anschaffen, Risse abcopiren, Farben coloriren und anders zur Mahlerey gehöriges gründlich erlernen könne. Allen denen, welche die Ingenieur-Kunst zu lernen belieben, als auch Mahlern und andern Künstlern, so mit Farben umgehen müssen, sehr dienlich und nützlich / anfangs in französischer Sprach hrsg. von H[enri] Gautier de Nimes ; nunmehro aber ins Teutsche übersetzt. - Diese zweyte Edition vermehrt, und mit dienlichen Kupffern versehen. - Nürnberg : Peter Conrad Monath, 1719. - [14], 96 p. : front, [1] folding pl.

Contents: p. [13].

§ This appendix is missing in some copies.

Henri Gautier was an engineer from Nimes. He is sometimes called 'Hubert' Gautier.

In: *Börsenverein 1885*: 65–66; BS; DBI-VK; DBSM; GLVA: no. 1481; NSUG; NUC–1956, vol. 68 (2×); SLSU.

042.18

[Notes on etching]. - [S.l.], [c. 1750]. - [1] p. ; 17 cm.

In: **Bosse** (Nürnberg 1719) [No. 042.17]: back flyleaf recto.

§ Manuscript.

Language: German.

Contains a recipe for etching ground and a recipe for mordant.

1 –

Line Etching

In: DBSM, Bö B III 985.

042.19

Abraham Bossens gründliche Anweisung zur Radier- und Etz-Kunst, nehmlich: wie man mit Scheid-Wasser in Kupffer und andern Metallen etzen, das Wasser, wie auch den harten und weichen Etzgrund bereiten solle; ferner, wie die Kupffer-Platten abzudrucken; die Drucker-Presse zu machen, und was man sonsten dabey in acht zu nehmen hat. Diesem ist als ein Anhang beygefügt: H. Gautier de Nismes Kunst zu Tuschen / [transl. by Georg-Andreas Böckler] ; [?] Dehne sc. - [2nd ed.]. - Nürnberg : bey Peter Conrad Monath, 1745 ; Nürnberg : Verlegts Peter Conrad Monath, 1746. - [14], 209, [7] p. : front., 16, [4] ; 16.5 cm.

MIP: pp. [1]–[14], 1–174 : front., 16, [3] Fig.

Contents Bosse: p. [1] at the back of the first part.

Contents Nimes: p. [13] at the beginning of the second part.

§ Pp. [1]–[14] have been reset; pp. 1–209, [1]–[7] look identical to copies of the 1719 edition, including decoration, layout and particular damages. The watermarks of pp. [1]–[14] of copies of both editions are different. The rest of the sheets of both editions do not have a watermark. This suggests that the first quire of the edition 1746 has been reset and that the rest of the text is a remainder of the 1719 edition.

Probably printed in 1745 and published in 1746, see Appendix 2, p. 96.

Photomechanical reprint: Oggelshausen 1986 [No. 042.39].

– Appendix 1, p. 133: 'Appendix, das ist: Zugabe oder Anhang, handelt von der Herold- Mahl- und Reiß-Kunst … [etc.] / durch Georg-Andreas Böcklern'.

– Appendix 2: L'Art de laver … [etc.] / H[enri] Gautier de Nismes. - [14], 96 p. : front, [1] folding pl.

§ P. 96: 'Nürnberg, gedruckt bey Michael Arnold. 1745'.

In: BIBSYS; *Bigmore & Wyman 1880–1886*, 1: 72f; DBSM; NUC–1956, vol. 68; *Singer & Strang 1897*: no. 39.

042.20

Gründliche Anweisung zur Radier und Etz Kunst / Abraham Bosse. - [S.l.], 1760. - 1 vol. : ill. ; […] cm.

§ Manuscript.

Language: German.

Copy of one of the German translations of Bosse with a similar title published before 1760, thus either Nürnberg 1719 [No. 042.17] or Nürnberg 1745/1746 [No. 42.19].

NLA: 'Manuscript, a manual, text in German, with illustrations for the art of etching and engraving.'

Title description after NLA.

NOT SEEN

In: NLA, ms 101.

042.21

Abraham Bossens gründliche Anweisung zur Radier- und Etz-Kunst, nehmlich: wie man mit Scheidwasser in Kupfer und andere Metalle etzen, das Wasser, wie auch den harten und weichen Etzgrund bereiten solle; ingleichen, wie die Kupferplatten abzudrucken, die Druckerpresse zu machen, und was man sonsten dabey in acht zu nehmen hat. Nebst H[enri] Gautier de Nismes Kunst zu Tuschen / [transl. by Georg-Andreas Böckler] ; [?] Dehne fe. - [3rd ed.]. - Nürnberg : bei George Peter Monath, 1761. - [14], 209, [7]: front., 16, [4] Fig. ; 17.5–18 cm.

MIP: pp. [1]–[14], 1–174 : front., 16, [3] Fig.

Contents Bosse: p. [1] at the back of the first part.

§ Text and *Figuren* are printed on the same sheets.

– Appendix: Die Kunst zu tuschen, oder die neueste Manier Vestungen und andere Risse mit gehörigen Farben zu mahlen und zu tuschen. Nebst einer Anweisung, wie man die Farben abreiben, vermischen, Penseln, Schifgen und alles hierzu nöthige anschaffen, Risse abcopiren, Farben coloriren und anders zur Mahlerey gehöriges gründlich erlernen könne. Allen angehenden Ingeniern, Mahlern und andern Künstlern, so mit Farben

umgehen, sehr dienlich und nützlich / aus dem französischen des Herrn H[enri] Gautier de Nimes ins teutsche übersetzt [by Georg-Andreas Böckler]. - Nürnberg : bei George Peter Monath, 1761. - [14], 96 p. : [1] pl., [1] folding plate.
Index: p. [13].
Contents: p. [13].
§ The plate opposite p. 41 and the folding plate are etchings.
Title description of this appendix after a microfilm of the '1761' dated appendix in the edition Nürnberg 1766 [No. 042.22].
In: CCB; DBSM; NUC–1956, vol. 68 (3×); OCLC (2×); ÖNB; *Singer & Strang 1897*: no. 50; UBA (?); UBH.

042.22

Abraham Bossens gründliche Anweisung zur Radier- und Etz-Kunst, nehmlich: wie man mit Scheidewasser in Kupfer und andere Metalle etzen, das Wasser, wie auch den harten und weichen Etzgrund bereiten solle; ingleichen, wie die Kupferplatten abzudrucken, die Druckerpresse zu machen, und was man sonsten dabey in acht zu nehmen hat. Nebst H[enri] Gautier de Nismes Kunst zu tuschen / [transl. by Georg-Andreas Böckler]. - Verbesserte [4th] Aufl. - Nürnberg : bei George Peter Monath, 1766. - [16], 209, [7] : 16 Fig., [1] woodcut, [2] engr., [1] woodcut ; 17 cm.
§ Probably a re-edition of the edition 1761 [No. 042.21] with a new title page, seeing that the appendix has the publication date '1761'.
The *Figuren* are etchings.
– Appendix 1, p. 133: Zugabe oder Anhang von der Herold- Mahl- und Reiß-Kunst; worinnnen begriffen, was man bey dem Kupferstechen oder in der Etzkunst davon zu wissen nöthig hat. Nebst beygefügten Figuren, und Beschreibung verschiedener Sinnbilder und deren Auslegungen / durch Georg Andreas Böcklern.
§ Title description after microfilm.
– Appendix 2: Die Kunst zu tuschen, oder die neueste Manier Vestungen und andere Risse mit gehörigen Farben zu mahlen und zu tuschen. Nebst einer Anweisung, wie man die Farben abreiben, vermischen, Penseln, Schifgen und alles hierzu nöthige anschaffen, Risse abcopiren, Farben coloriren und anders zur Mahlerey gehöriges gründlich erlernen könne. Allen angehenden Ingeniern, Mahlern und andern Künstlern, so mit Farben umgehen, sehr dienlich und nützlich / aus dem französischen des Herrn H[enri] Gautier de Nimes ins teutsche übersetzt [by Georg-Andreas Böckler]. - Nürnberg : bei George Peter Monath, 1761. - [14], 96 p. : [1] pl., [1] folding plate.
Index: p. [13].
§ The plate opposite p. 41 and the folding plate are etchings.
In: BS; DBI-VK; GV.

042.23

Die Kunst in Kupfer zu stechen, sowohl vermittelst des Aetzwaßers als mit dem Grabstichel; ingleichen die sogenannte schwarze Kunst, und wie die Kupferdrucker-Preße nach ietziger Art zu bauen und die Kupfer abzudrucken sind / ehemals durch Abraham Boße etwas davon heraus gegeben. Jetzo aber [aus dem französischen ins Deutsche übersetzt,] aufs neue durchgesehen, verbeßert und um die Hälfte vermehret [by Carl Gottlieb Nitzsche] ; [prints copied after the French edition by Carl Gottfried Nestler]. - [1st ed.]. - Dresden : bey dem Verleger [Carl Gottlieb Nitzsche], und in der Gröllischen Handlung, in Commisssion zu haben, 1765. - [36], 254, [36] p. : front., [3] ill., 19 Fig., [8] vign. ; 17–17.5 cm.
Index: p. [1] at the back.
Addenda & corrigenda: p. [36] at the back.
§ New German translation after the edition: Paris 1745 [No. 042.8], see p. [6] at the beginning. Faithful translation after the French text, with comments in the footnotes.
Dedicated to Friedrich Carl Bose: p. [3]–[4].
The *Figuren* are etchings. The etchings are printed separately and bound with the text. *Figuren* 6, 7, 12 and 19 are copied in reverse. The four vignettes at the head of each chapter are copied, the four vignettes at the end of each chapter are new. The [3] illustrations are etchings that are printed in the text on pp. 33, 97 and 99.
P. 202 is numbered '102'.
Meynier considered this a better translation than the 1652 one; **Meynier** (Hof 1804) [No. 208]: 2–3.
Photomechanical reprints: Osnabrück 1975 [No. 042.35]; Zirndorff 1986 [No. 042.40].
1 –
Échoppe / Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Counterproof / Ink / Monotype / Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Aesthetics / Art History
In: *Börsenverein 1885*, p. 66; DBI-VK; DBSM; GV; NSUG; NUC–1956, vol. 68 (3×), vol. 222; OCLC (2×); *Peddie 1962*, vol. 1; RMA 323 F 15; *Singer & Strang 1897*: no. 54; UBH; ULC.

042.24

Die Kunst in Kupfer zu stechen, nach den verschiedenen Arten, ingleichen wie die Kupferdrucker-Preße nach der besten Art zu bauen und die Kupfer abzudrucken sind / wovon ehemals ein Köningl[icher] Kupferstecher zu Paris Abraham Boße, etwas heraus gegeben. Anitzo aber verbessert, vermehret und mit vielen Kupfertafeln versehen ; aus dem Französischen [transl. by Carl Gottlieb Nitzsche] ; [prints copied after the French edition by Carl Gottfried Nestler]. - Zweyte Aufl. - Dresden : in der Gröllischen Handlung, 1772. - [36], 254, [36] p. : front., [3] ill., 19 Fig., [8] vign. ; 17–17.5 cm.
Index: p. [1] at the back.
Addenda & corrigenda: p. [36] at the back.
§ Dedicated to Beloselski, p. [3]–[4].
Identical to the edition Dresden 1765 except for the title page and the dedication. Compare with the printing errors on p. [36] at the back of both editions, which are not corrected in this second edition.
Title description after microfiche.
In: SBB.

042.25

Kunst in Kupfer zu stechen / ehemals durch Abraham Bosse etwas davon heraus gegeben ; jetzo aber ganz neu bearbeitet und mit den neuesten Erfindugnen der heutigen Künstler beschrieben, zur Belehrung für angehende Künstler und Liebhaber [von] Johann Conrad Gütle ; J[ohann] C[onrad] Gütle del. - Nürnberg ; Altdorf : bei J.C. Monath und J.F. Kußler, 1795–1796. - 3 vol. : etch. ; 19–19.5 cm.

§ Comment: **Meynier** (Hof 1804) [No. 208]: 3.

Review: *Journal der bildenden Künste*, 1 (1795): 37–58. The reviewer is rather critical about Gütle's work, gives many examples of printing errors, is particularly unhappy about the art historical part in the first chapter and explains why, in his eyes, Gütle does not know much about etching and engraving. Gütle in his turn comments on this review in his vol. 3, p. X.

– Vol. 1: Kunst in Kupfer zu stechen, zu Radiren und zu Aezen, in schwarzer Kunst und punktirter Manier zu arbeiten / ehemals durch Abraham Bosse etwas davon heraus gegeben ; jetzo aber ganz neu bearbeitet und mit den neuesten Erfindungen der heutigen Künstler beschrieben, zur Belehrung für angehende Künstler und Liebhaber [von] Johann Conrad Gütle ; J[ohann] C[onrad] Gütle del., A. Gatler inv. et sc. ; J. Leitner sc. - Nürnberg ; Altdorf : bei J.C. Monath und J.F. Kußler, 1795. - [2], XXII, 552 p. : [3] vign., [19] Tab.

Suppliers: pp. XI–XIV.

Contents: p. XV.

Directions to the bookbinder: p. XXII.

List of engravers: p. 51.

MIP: pp. 113–552.

With literature.

§ Preface dated, p. XIV: 'Nürnberg, den 12ten October 1794'.

One vignet is on the title page, two others are in the text.

The *Tabelle* are plates. The order and number of the *Tabelle* change per copy. The nineteen *Tabelle* in copies RMA and GLVA are numbered: 'I–XIII', 'XXIV–XXIX'. The copy GLVA has all *Tabelle* bound with vol. 3: I–III, IV–VI, VII–VIII plus X (all have three figures etched on one plate printed on one sheet), XI, IX, XII, XIII, XXIV–XXV (from here double numbers with two figures etched on one plate and printed on one sheet), XXVII–XXVI, XXVII–XXIX, XIV, XVI–XVII, XIX–XVIII, XX, XXI, XXII–XXIII, XXIV–XXV, XXVI. The title page says: 'Mit Vignetten und XIX. Kupfern.' Directions to the bookbinder, p. XXII: 'Nachricht an den Buchbinder. Die XIX Kupfertafeln haben nachstehende Zahlen zur Rubrik, wornach sich derselbe zu richten hat. Zuerst kommt: Tab. I bis XIII. Sodann folgt: Tab. XXIV bis XXIX, welche zusamm die auf dem Titelblatt angezeigten XIX Kupfertafeln ausmacht'.

The descriptions of engraving, mezzotint and Le Blon's colour printing process are largely after the edition Dresden 1765. The part on etching is after **Dossie** (London 1758 or 1764) [No. 080] 2: see p. VIII.

The *Tabelle* are copied after the following sources: Tab. I–XIII is after **Bosse** (Paris 1745 or 1758) [No. 042.11]; Tab. XV–XIV is the press after **Bosse** (Paris 1645) [No. 042.2]; Tab. XVI–XVII is the press after **Bosse** (Paris 1745 or 1758) [No. 042.8 or 042.11]; Tab. XXIV–XXVII are new; Tab. XXVIII, Fig. I–II are after **Cröker** (Jena 1736) [No. 068]: 295; Fig. IV–VIII are after **Bylaert** (Leiden 1772) [No. 056]: all; Tab. XXIX after **Bosse** (Dresden 1765) [No. 42.23]: the illustraties on p. 33 (= Fig. IV), p. 97 (= Fig. II) and p. 99 (= Fig. V).

– Vol. 2: Kunst, in Kupfer zu stechen, nach Zeichnungsmanier zu arbeiten, in Marmor und Glas zu radiren und äzen, Kupferstiche abzuziehen und zu bleichen, nebst verschiedenen zur Kupferstecherkunst gehörigen Wissenschaften. Zur Belehrung für angehende Künstler und Liebhaber. Zweyter Theil. - 1795. - [16], 350 p. : [1] vign., 2 Tab.

Contents: p. [13].

With literature.

§ Preface dated, p. [12]: 'Nürnberg, den 14. April 1795'.

Pp. 88–95 is the crayon technique of **Bylaert** (Amsterdam, Leipzig 1773) [No. 056]; pp. 95–117 are the crayon techniques of **Tischbein** (Cassel 1790 or Berlin 1792) [No. 337].

– Vol. 3: Kunst, in Kupfer zu stechen, worinnen die Kunst Kupfer zu drucken und Abdrücke von Gold auf Gypstafeln zu machen, abgehandelt is, nebst ein deutlichen Beschreibung der Kupferdruckerpresse und aller zum Kupferdrucken nötigen Instrumente. Zur Belehrung für angehende Künstler und Liebhaber. Dritter Theil. - 1796. - XXIV, 135, [1] p. : Tab. XIV–XXVI.

Contents: p. XXII.

§ P. X: 'Kurzen Antikritik einer Rezension des ersten Theils meiner Kunst in Kupfer zu stechen, die in dem neuentstandenen Journal der bildenden Künste, 1. Heft, Nürnbe. 1795, S. 37f. vorkommt.'

Preface dated, p. XXI: 'Nürnberg den 14. September 1795'.

1 –

Aquatint / Crayon Engraving / Crayon Etching / Échoppe / Line Engraving / Line Etching / Mezzotint / Stipple Engraving

2 –

Brass / Copper / Glass

3 –

Casting / Hand-colouring / Ink / Multiple-plate Printing / Press / Print behind Glass / Printing à la Poupée / Printing in Black / Printing Polychrome

4 –

Woodcut

5 –

Aesthetics / Art History / Conservation and Restoration

In: *Bigmore & Wyman 1880–1886*, 1: 283; BL; *Blas Benito 1994*: 68; BNP; BS; CCB; DBI-VK; GV; MAK, p. 291; MET; NSUG; NUC–1956, vol. 222 (5×); OCLC (3×); ÖNB; *Peddie 1962*, vol. 4; RMA (vol. 1 only); SBB; *Singer & Strang 1897*: nos. 70, 73; TUD; UBAB; UBU (vol. 1 only).

042.26

Tractaet in wat manieren men op root koper snijden ofte etzen zal: door de middel der stercke-wateren, ende harde- en zachte-vernissen, ofte gronde: als mede de manieren der zelve plaeten te drucken, de pars te maecken, ende andere dinghen, behelzende de zelve konsten / in 't fransch beschreven door A[braham] Bosse ; in 't nederduyts overgezet door P[ieter] H[olsteyn]; ['Toe-gift' by the transl. Pieter Holsteyn] - Amsterdam : by Jacob van Meurs, 1662. - [18], 1–56, [2], 57–82, [2], 183 [sic! = 85]–122, [8] p. : front., [16] fig. ; 15.5–16.5 cm.

Supplier: p. [5] at the back.

Contents: p. [6] at the back.

§ Title means: Treatise in what manners one shall engrave or etch on red copper: by means of strong-waters, and hard and soft varnishes, or grounds; as well as the manners to print the same plates, to make the press, and other things, concerning the same arts

Translation of the edition: Paris 1645.

The translation is fairly literal, with a few adaptions to the contemporary situation in the Netherlands; for example, linseed oil (p. 103) is used instead of walnut oil for making oil varnish for black printing ink. The translation is followed (pp. 118–122) by a list of ten new recipes for etching grounds, probably compiled by Pieter Holsteyn himself.

The translator was an engraver himself, see remarks relating to his etching activities on pp. 119, 120, 122 and p. [5] at the back. 'P.H.' is therefore Pieter Holsteyn II (1614?–1683), because there was only one engraver with the initials 'P.H.' working in Amsterdam in 1662; *Waller 1974*, p. 146. He

therefore would also have copied the plates.

Printed: Amsterdam: ter drukkerye van Steven van Lier, 1662.

P. 83 is numbered '183'.

The prints are not numbered, but every print has the page number with which it accompanies.

All plates etched first and finished by engraving. All plates are copied in reverse except for nos. 5 (with p. 32), 9 (with p. 74) and 10 (with p. 77), because they show right hands at work.

For an integral ms copy see below [No. 042.27]. For an annotated selection see *Verheijden* (Den Haag 1736–1739) [No. 347]. A large part of this text is almost literally copied in **Witgeest** (Amsterdam 1679) [No. 357].

I am preparing an annotated facsimile edition with an introduction and English translation: Houten: Hes & de Graaf, forthcoming.

1 –

Échoppe / Line Engraving / Line Etching

2 –

Copper

3 –

Counterproof / Monotype / Press / Multiple-plate Printing / Printing in Black / Printing Monochrome / Printing Polychrome

5 –

Art History

In: BL; *Bigmore & Wyman 1880–1886*, 1: 72; BLBS; CCB; ENS; GMPL; HAUM; KB; MBvB; MMW; MSE; MVvG; NCC; NUC–1956, vol. 68 (3×); OCLC (2×); PBM; Priv.Coll. (2×); PUL; RHM; RKD; RMA; *Singer & Strang 1897*: no. 15; SPKA (missing); TM; TUD; UBA (5×); UBG; UBL; UBU; one copy destroyed during the bombing of Rotterdam in 1940.

042.27

Traicté des manieres de graver en taille dovce sur l'airin. Par le moyen des eaux fortes & des vernix durs & mols. Ensemble de la façon d'en imprimer les planches & d'en construire la presse, & autres choses concernans lesdites arts = Tractaet in wat manieren men op root kooper snijden ofte etzen zal. Door de middel der stercke wateren, ende harde- en zachte vernissen, ofte gronde. Als mede de manieren der zelve plaeten te drucken, de pars te maecken, en andere dinghen, behelzende de zelve konsten / par A[braham] Bosse = i[n] 't fransch beschreven door A[braham] Bosse ; in 't nederduyts overgezet door P[ieter] H[olsteyn]. - [S.l.], [1662–1700]. - 156 fol. : [19] drawings ; 19 cm.

§ Manuscript.

Languages: French, Dutch.

Fol. 1–88: transcription of the edition Paris 1645 [No. 042.2], with drawings after the 19 pl.

Fol. 89–156: transcription of the edition Amsterdam 1662 [No. 042.26].

The two texts are in two different hands, but the kind of paper is the same throughout the volume.

Title description after information by the owner of the ms. and *Janssen 2011*: 301–304.

This is the same description as [No. 042.5].

NOT SEEN

In: Priv.Coll.

042.28

[Note on etching]. - [S.l.], [c. 1700]. - [1] p. ; 16 cm.

In: **Bosse** (Amsterdam 1662) [No. 042.26], verso of front flyleaf, opp. frontispiece.

§ Manuscript.

Language: Dutch.

Recipe for 'witten vernis', ie a transparent solution of gum sandarac, mastic, benzoin resin and Venice turpentine in alcohol.

1 –

Line Etching

In: RKD, PREC/27A24.

042.29

The art of graveing, and etching, wherein is exprest the true way of graueing in copper. Allso the manner & method of that famous [Jaques] Callot, & Mr. [Abraham] Bosse, in their seuerall ways of etching / [Abraham Bosse] ; published [= transl.] by Will[ia]m Faithorne ; to my ingenious friend Mr. Faithorne on his book, [an eulogy] by T. Flatman. - [1st ed.]. - [London] : sold by William Faithorne, 1662. - [10], 48 p. : engr. titlep., 10 pl. ; 16–17 cm.

Dedication: p. [3].

Poem: p. [7].

Contents: p. [8].

§ Translation of the edition Paris 1645. Faithful translation without the preface and without the chapter on printing, which was only added to the second edition. A few parts are shortened or moved and there are occasional adaptations to the English situation, see Faithorne's remark about this on p. [5].

John Evelyn was working on a translation of Bosse treatise, but desisted from adding it to his 'Sculptura' when he heard about Faithorne's; **Evelyn** (London 1662) [No. 097.2]: [1]–[2] at the back. The Stadtarchiv Heidelberg has a copy of Evelyn's 'Sculptura' bound together with Faithorne's translation of Bosse, both the 1662 editions, and the British Museum has three volumes similarly bound; *Keynes 1968*, p. 117. Evelyn's translation was only published in 1906, see: **Evelyn** (Oxford 1906) [No. 097.12].

Without frontispiece. All plates are engraved.

Dedication to Robert Peake.

For some contemporary verses in manuscript on Faithorne's 'Art of Graving and Etching' by Thomas Flatman see: BL, ms. Sloane 2285, fol. 147b.

See: **Academia Italica** [No. 003], for an etching ground recipe taken from Faithorne.

See: **Art of drawing in perspective** [No. 012], for some recipes taken from Faithorne.

See: **Sculptura historico-technica** [No. 304], which copied part of Faithorne's translation.

Photomechanical reprint: New York 1970 [No. 042.34].

1 –

Échoppe / Line Engraving / Line Etching

2 –

Copper

In: *Bigmore & Wyman 1880–1886*, 1: 210; BL (4×); *Blas Benito 1994*: 78; BLBS; *Bridson & Wakeman 1984*: nos. B3, B67; BM (3×); CCB; DBI-VK; *Figueras Ferrer 1992*: 1044; *Levis 1912*: 21–22; MET; NUC–1956, vol. 166 (8×); NUC 1977–1980 (under Faithorne); OCLC (13×); RMA; *Singer & Strang 1897*: no. 14; SAH; ULC-St John's College; *Wing 1972–1988*: no. F294 (11×).

042.30

The art of graving and etching. Wherein is express'd the true way of graving in copper. Also the manner and method of the famous [Jacques] Callot, and Mr. [Abraham] Bosse, in their several ways of etching / [Abraham Bosse] ; published [= transl.] by William Faithorne ; [introd. by] M.G. - The second ed. To which is added, the way of printing copper-plates, and how to make the press. - London : printed for A[bel] Roper, 1702. - [2], VI, 72 p. : 16 pl. ; 16–17 cm.
Contents: p. III.
§ Without frontispiece, introduction, dedication and poem. The title page is printed in letterpress.
All plates are engraved. The plates are numbered '1–10', plates [10]–[16] give the pages they are to face.
ESTC: 'A reissue of the first edition of 1662 with a different titlepage.' The publisher had a remainder of the 1662 edition, replaced the title page, the dedication and the contents, and added the chapter on printing, which shows by the differences in type and paper; see the photomechanical reprint: New York 1970 [No. 042.34]: XIV. The introduction is now signed by one 'M.G.'. The chapter on printing is a faithful translation after the edition Paris 1645; it is not the translation by John Evelyn.
Title description after other title descriptions, the edition London 1662 [No. 042.29] and the photomechanical reprint: New York 1970 [No. 042.34].
Photomechanical reprint of the chapter on printing: New York 1970 [No. 042.34].
1 –
Échoppe / Line Engraving / Line Etching
2 –
Copper
3 –
Counterproof / Monotype / Press / Multiple-plate Printing / Printing in Black / Printing Monochrome / Printing Polychrome
5 –
Art History
NOT SEEN
In: *Bigmore & Wyman 1880–1886*, 1: 210; BL; BLBS; *Bridson & Wakeman 1984*: nos. B3, B67; ESTC: no. t117644; *Levis 1912*: 21–22, 556; NUC–1956, vol. 166 (3×); OCLC.

042.31

Tratado da gravura a agua forte, e a buril, e em maneira negra com o modo de construir as prensas modernas, e de imprimir bm [sic!] talho doce / por Abraham Bosse ; nova ediçã̃o traduzida do francez por José Joaquim Viegas Menezes ; [dedicatie door José Joaquim Viegas Menezes] ; [engr. by António Jose Quinto, [?] Jorge, Manoel da Silva Godinho]. - Lisboa : na Typographia Chalcographica, Typoplastica, e Litteraria do Arco do Cego, 1801. - [8], IX, [1], 189, [1] p. : front., 21 est. ; 20–21 cm.
Contents: p. 185.
Specimens: est. 14, 15.
Addenda & corrigenda: p. [1] at the back.
§ Title means: Treatise of engraving with strong water, and with the burin, and in mezzotint with the way of building the modern presses, and intaglio printing
Title on frontispiece: Maneira d[e] gravar a agva forte por Anto. Bosse
Faithful translation of the edition: Paris 1758 [No. 042.11].
Lairesse's treatise was also translated in 1801 making both of them the first instructions for engraving and etching published in Portugal; **Lairesse** (Lisboa 1801) [No. 177.14]; *Soares 1971*, vol. 1 p. 11.
Estampa 14, Fig. 11, 12, and 13 are specimens of crayon engraving, *Estampa* 15 is a specimen of roulette engraving (the ears).
NUC–1956: 'Engraved on tinted paper, 28.5 cm [sic!].'
1 –
Aquatint / Crayon Engraving / Échoppe / Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Counterproof / Ink / Multiple-plate / Press / Printing / Printing in Black
4 –
Chiaroscuro Woodcut / Woodcut
5 –
Aesthetics / Art History
In: BL; *Blas Benito 1994*: 67; BNL (2×); NUC–1956, vol. 68; OCLC; RMA; *Soares 1971*, 1: 39 and 2: 506.

042.32

Abraham Bosse et la société française au dix-septième siècle / André Blum ; préface de Gabriel Hanotaux. - Paris : Morancé, 1924. - XXXIII, 226 p. : XXIV pl. ; 24 cm.
MIP: Lettres patentes qui permettent aux sieurs Abraham Bosse, graveur en talle douce, et Charles Delafont, d'imprimer sur toutes estoffes de soye, papier, vélin, parchemin, cuir, etc. … . - P. 187–188.
§ Transcription of: Paris 1637 [No. 042.1].
In: KVK; RMA; UBA; UBG; UBL; UBU; VU.

042.33

Abraham Bosse e il suo trattato della calcografia / Luigi Servolini. - Bologna : Ratta, 1937. - [10], 203 p. : [2], XVI Tav., [3] vign. ; 25.5 cm.
List of works by Servolini: p. [1].
Literature: p. 37.
Italian translation: pp. 39–116 : [2], XVI Tav., 3 vign.
Transcription of the text of Paris of 1645 [No. 042.2]: pp. 117–198.
Contents: p. 199.
Edition: 500 copies.

§ Title means: Abraham Bosse and his treatise on chalcography

The three vignettes after the edition: Paris 1745 [No. 042.8].

Has a transcription of the text and a modern Italian translation of the edition: Paris 1645 [No. 042.2]. This is the first and only Italian translation of Bosse's treatise: p. 93. The first Italian etching manual is: **Gariazzo** (Torino 1907) [No. 116].

Servolini annotates the differences between the French editions of 1645 [No. 042.2] and 1745 [No. 042.8].

With an introduction about Bosse and his publications: pp. 1–32.

In: BL; BLBS; *Figueras Ferrer 1992*: 1069; NUC–1956, vol. 68 (6×); OCLC (12×); UBH; SBB; UBU.

042.34

The art of graveing and etching / by William Faithorne ; new introduction by Jacob Kainen. - Unabridged republication. - New York : Da Capo Press, 1970. - XV, [115] p. : [16] ill. ; 19 cm. - (Da Capo Press Series in Graphic Art ; 9)

Contents: p. [9].

SBN 306–71049–8 (softcover)

§ Photomechanical reprint of: London 1662 [No. 042.29]; London 1702 [No. 042.30].

Contains the integral edition of London 1662, and the title page and the translation of the chapter on printing and the construction of the press of the edition London 1702.

Modern introduction dated, p. XV: 'Washington, D.C. 1968'.

The pagination is not visible, probably because the original bookblock was cut off too short thereby severing its page numbers.

In: *Blas Benito 1994*: 78; *Bridson & Wakeman 1984*: nos. B3, B67; CCB; FCG; KB; NCC; NUC 1968–1972, vol. 28; OCLC (32×); RMA; UBA.

042.35

Die Kunst in Kupfer zu stechen / Abraham Bosse. - Faksimiledruck. - Osnabrück : Ivon Illmer, 1975. - [38], 254, [36] p. : front., [3], 19 ill., [8] vign. ; 20 cm.

Index: p. [1] at the back.

Edition: 200 copies.

§ Photomechanical reprint of: Dresden 1765 [No. 042.23].

The error in paging is kept, p. 202 misnumbered '102'; compare with the edition: Zirndorff 1986 [No. 042.40].

In: BS; DBI-VK; DNB-L; OCLC (2×); Priv.Coll.; UBU.

042.36

Radier-Büchlein, handelt von der Etzkunst, nehmlich: wie man mit Scheidwasser in Kupffer etzen, das Wasser, wie auch den harten und weichen Etzgrund machen solle; beneben kurtzer Beschreibung, wie die Kupfferplatten abzudrucken; die Drucker-Presse zu machen, und was man sonsten darbey in acht zu nehmen hat / erstmals durch Abraham Bosse in Französischer Sprache beschrieben; in Teutscher Sprach heraus gegeben und vermehret durch Georgium Andream Böcklern ; Vorwort und Dedicatio von Georg-Andres Böckler ; Lob-Gedicht von Georg-Philipp Harsdörffer ; A[braham] Aubry fecit [front.]. - [Photom. repr.]. - Darmstadt : Lehrdruckerei der Technischer Hochschule Darmstadt, 1976. - 128, [9] p. : front., 16, [1] Fig. ; 17.5 cm.

Contents: p. [1].

Edition: 250 copies.

§ Photomechanical reprint of: Nürnberg 1689 [No. 042.16].

The 'Zugabe von der Herold-Mahl und Reiß-Kunst mit dazugehörigen Figuren' has not been copied: p. [9].

Date of printing, p. 9: 'Gedruckt im Herbst 76'.

In: BS; DNB-F; DBI-VK; NUC 1987–1992, (under Bosse); OCLC.

042.37

Radier-Büchlein, handelt von der Etzkunst, nehmlich: wie man mit Scheidwasser in Kupffer etzen, das Wasser, wie auch den harten und weichen Etzgrund machen solle; beneben kurtzer Beschreibung, wie die Kupfferplatten abzudrucken; die Drucker-Presse zu machen, und was man sonsten darbey in acht zu nehmen hat / erstmals durch Abraham Bosse in Französischer Sprache beschrieben; in Teutscher Sprach heraus gegeben und vermehret durch Georgium Andream Böcklern ; Vorwort und Dedicatio von Georg-Andres Böckler ; Lob-Gedicht von Georg-Philipp Harsdörffer ; A[braham] Aubry fecit [front.]. - Neudruck. - Gräfelfing vor München : Heinz Moos, cop. 1977. - [19] p., p. 0–128, [5] p. : front., 16, [1] Fig. ; 18 cm.

Contents: p. [1].

ISBN 3-7879-0088-8 (hardcover)

§ Photomechanical reprint of: Nürnberg 1689 [No. 042.16].

The 'Zugabe von der Herold-Mahl und Reiß-Kunst mit dazugehörigen Figuren' has not been copied; see colophon at the back.

In: ABK; BS; DNB-F; DBI-VK; DNB-L; NCC; UBA; UBU.

042.38

Traicté des manieres de graver en taille douce sur l'airin. Par le moyen des eaux fortes & des vernis durs & mols. Ensemble de la façon d'en imprimer les planches & d'en construire la presse, & autres choces concernans lesdits arts / par A[braham] Bosse ; [bio-bibliography of Bosse by Jean-Claude Bailly]. - [Photom. repr.]. - [Paris] ; [Melsungen] : [Gutenberg Reprint], [1979]. - [7], 75, [1] p. : [4], 18 reprod. + loose insert of [8] p. ; 17 cm.

Contents: p. 6.

§ Photomechanical reprint of: Paris 1645 [No. 042.2].

Pl. 5 and 6 are reproduced twice; for further details see the annotation with: Paris 1645.

The loose insert contains a bio-bibliography of Bosse by Jean-Claude Bailly.

In: *Blas Benito 1994*: 67; DBI-VK; KCA; NCC; OCLC (6×); Priv.Coll. (2×); UBA; UBLv.

042.39

Abraham Bossens gründliche Anweisung zur Radier- und Etzkunst : nemlich: wie man mit Scheid-Wasser in Kupffer und andern Metallen etzen, das Wasser, wie auch den harten und weichen Etz-Grund bereiten solle; ferner, wie die Kupffer-Platten abzudrucken; die Drucker-Presse zu machen, und was man sonsten dabey in acht zu nehmen hat. Diesem ist als ein Anhang beygefügt: H. Gautier de Nismes Kunst zu Tuschen / [ed. by Heinrich Stähle]. - [Photom. repr.]. - Oggelshausen : Genth ; Weingarten : KBZO, 1986. - [18], 209, [23], 96, [3] p. : front., 16, [4] Fig., front. ; 17.5 cm. - (Genths Faksimiles : Alte künstlerische und graphische Techniken ; 1).

Contents: p. [1] in the middle, p. [22] in the middle.

Titles in the series: p. [2] at the back.

ISBN 3-89255-001-8 (hardcover?)

§ Photomechanical reprint of: Nürnberg 1746 [No. 042.19].

Misses the folding plate.
In: DBI-VK; SBB; UBH.

Die Kunst in Kupfer zu stechen, sowohl vermittelst des Aetzwassers als mit dem Grabstichel; ingleichen die sogenannte schwarze Kunst, und wie die Kupferdrucker-Preße nach ietziger Art zu bauen und die Kupfer abzudrucken sind / ehemals durch Abraham Boße etwas davon heraus gegeben ; jetzo aber aufs neue durchgesehen, verbeßert und um die Hälfte vermehret [und] aus dem französischen ins Deutsche übersetzt [von Carl Gottlieb Nitzsche] ; [prints copied after the French edition by Carl Gottfried Nestler]. - [Photom. repr.]. - [Zirndorff] : [Verlag für moderne Kunst Leopold Eugen, Dr. K.G. Schmidt], [1986]. - [36], 254, [36] p. : front., [3], 19 ill., [8] vign. ; 18 cm.
Index: p. [1] at the back.
§ Photomechanical reprint of: Dresden 1765 [No. 042.23].
The error in paging is changed: p. 202 originally misnumbered '102' is corrected to '202'; compare with the edition: Osnabrück 1975 [No. 042.35].
In: NCC; Priv.Coll. (2×); UBA.

[Ju-nana seiki furansu doubanga gihou no kenkyu. Abraham Bosse 'San to kounan no wanisu ni yoru dou-ou-hanga gihou'] = Recherche sur la technique de la gravure à l'eau-forte au 17e siècle en France. Traduction japonaise du Traicté des Manières de graver en Taille Douce sur L'Airin par le Moyen des Eaux Fortes, & des Vernix Durs & Mols d'Abraham Bosse / traducteurs A[kitaka] Kawakami, T[suneo] Ueda, A[yumi] Yasui et Y[oshio] Kamitani. - Kanazawa : Institut de Recherche de l'École Supérieure d'Arts de Kanazawa [= Kanazawa College of Art], 2004. - 219 p. : front., 16, 5, [3], 16 ill. ; 22 cm.
Contents Bosse Japanese: p. 12.
Japanese translation: pp. 15–73.
Literature: p. 97.
Photomechanical reprint: pp. 113–219.
ISBN 4-907777-14-0 (hardcover)
§ Japanese translation of: Paris 1645 [No. 042.2].
Photomechanical reprint of: Paris 1645 [No. 042.2].
The frontispiece, plates and illustrations are part of the translation and the following comments. The *Aux amateurs* at the beginning of the introduction and the engraved title plate are not integrated in the translation, but are reproduced in the reprint only.
In: KCA; Priv.Coll.

Boutet (Henri) 043

La gravure à l'eau-forte simplifiée / Henri Boutet. - Paris : L'Atelier d'Art, Lefranc, [1904?]. - [6], 41, [5] p. ; 22–24.5 cm + [8] pl. - (Bibliothèque pratique des arts d'amateurs).
List of titles to be published in the series: p. [2] at the beginning.
Advertisement: p. [1] at the back.
Supplier: p. [2] at the back.
Plate printer: p. 30, [1] at the back.
Specimens: pl. [1].
§ Title means: Etching simplified
Printer: Beaumont-Persan: André Cayeux.
The *planches* are etchings, kept loose in a pocket on the inside backcover. The etchings are numbered: [1], 2, 3, 3, 4, 5, 6, 6.
This volume is the only title in the series that has been published.
1 –
Line Etching
2 –
Copper
4 –
Troubleshooting
In: *Blas Benito 1994*: 67; BNP; DBI-VK; *Figueras Ferrer 1992*: 1033; NSUG; NUC–1956.

Bouton (V.M.) 044.1

Traité elementaire et pratique pour apprendre à graver sans maitre / par V[ictor] M. Bouton. - Paris : Bouton, [1863?]. - [4], 53, [3] p. ; [6], 10, 2 fig. ; 18.5 cm.
Contents: p. 51.
Advertisement: backside of paper cover.
§ Title means: Elementary and practical treatise to learn engraving [= etching] without a master
Title on cover: Traité élémentaire de gravure à l'eau-forte, sur bois de buis, et sur bois de fil, d'apres Albert Dürer, Collot, etc.
The year of publication is taken from other bibliographies and could possibly be 1872, see the next edition.
Recipes for etching ground by Rembrandt en Callot (pp. 12, 14–15) after **Bosse** (Paris 1745 or 1758) [No. 042.89 or 042.11].
1 –
Line Etching
2 –
Copper / Steel
3 –
Printing in Black
4 –
Woodcut / Wood Engraving
5 –
Art History
In: *Börsenverein 1885*; CCB; KVB; NCC; RMA; UBA.

Traité elementaire et pratique pour apprendre à graver sans maitre / par V[ictor] M. Bouton. - Paris : Bouton, [1872].
§ Perhaps there was only one edition published in 1872. NUC–1956: [1873].
All copies signed by the author.
NOT SEEN
In: BNP; LC; NUC–1956.

Traité elementaire et pratique pour apprendre à graver sans maitre / par V[ictor] M. Bouton. - Paris : Bouton, [1877].
§ Perhaps there was only one edition published in 1872.
NOT SEEN
In: KVK.

Bowles (Carington)   045

NB: see also: **Artist's assistant** (Birmingham 1773) [No. 014]; **Enfield** (London 1809) [No. 090]; **Valuable secrets** (London 1775) [No. 342].

The artists assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting on glass, in crayons, and in water-colours. Containing the easiest and most comprehensive rules for the attainment of those truly useful and polite arts. Methodically digested, and adapted to the capacities of young beginners / [Carington Bowles?]. - [1st ed.]. - London : printed for T. Kitchin, [1760?]. - [6], 48 p. : 3 folding pl. ; 16.5–18 cm.
Contents: p. [4].
MIP: pp. 22–33.
Suppliers: pp. 22, 27, 30 and 31.
§ Title description after photocopy.
Perhaps there was only one edition between 1760 and 1770.
This text is copied almost literally in: **Artist's assistant** (see London 1785) [No. 014]; **Imison** (London 1785) [No. 159]; **School of arts improv'd** (Gainsborough 1776) [No. 296]; **School of wisdom and arts**, see Berwick 1783 [No. 296].
The plates are examples for drawing.
Intended audience, p. [3]: 'this Book is chiefly intended for the use of young Practitioners'.
1 –
Drypoint / Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Print behind Glass
4 –
Drawing / Painting
5 –
Aesthetics
In: OCLC.

The artist's assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting ... adapted to the capacities of young beginners / [Carington Bowles?]. - [? ed.]. -London : printed for T. Kitchin, [c. 1768?]. - [8], 48 p. : pl. ; 8º
§ Perhaps the same as the above edition.
NOT SEEN
In: BL; ESTC: no. t139979 (4×).

The artist's assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting, painting on glass, in crayons, and in water-colours ... [etc.]. - The second ed., improved. - London : printed for the author T. Kitchin, [1770?]. - [8], 48 p. : 3 folding pl. ; 18 cm.
§ Additional information with ESTC, t139979 and t162172, see editions above and below. OCLC: '[s.a.]'.
NOT SEEN
In: OCLC.

The artist's assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting, ... [etc.]. - The third ed., improved. - London : printed for Robret [sic!] Sayer, and John Smith, 1772. - [8], 48 p. : 1 folding pl. ; 19 cm.
§ OCLC: 'Index reprinted from the second edition with one chapter additional. Page references incorrect, chap. II–VIII.'
NOT SEEN
In: BL; ESTC: no. t162172; OCLC.

The artists assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting ... containing the easiest and most comprehensive rules for the attainment of those truly useful and polite arts ... [etc.]. - [? ed.]. - London : printed for the author, 1773. - 55, [1] p. : pl. ; 8º.
NOT SEEN
In: ESTC: no. t162170.

The artists assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting on glass, in crayons, and in water-colours ... / [by Carington Bowles]. - Second ed. improved. - London : for the author, R[obert] Sayer and J. Bennet, 1780. - 48 p. : ill. ; 18–19 cm.
NOT SEEN
In: BL; BLBS; OCLC (3×); ULC.

Bowles's artists assistant in drawing, perspective, ... Containing the easiest and most comprehensive rules for the attainment of those ... arts, adapted to the capacities of young beginners / [Carington Bowles]. - [? ed.]. - London : printed for and sold by the proprietor Carington Bowles, [1780?]. - 55, [1] p. : pl. ; 8º.

§ ESTC: 'Horizontal chain lines'.
NOT SEEN
In: ESTC: no. t124907.

045.8

Bowles's artist's assistant in drawing, perspective, etching, engraving, mezzotinto-scraing, painting on glass, in crayons, and in water-colours, and on silks and sattins. Containing the easiest and most comprehensive rules for the attainment of those truly useful and polite arts. - The sixth ed. Corr. and greatly improved with additions. - London : printed for and sold by Carington Bowles, 1783. - 62 p. : pl., folded ; 18.5 cm.
NOT SEEN
In: BLBS; ESTC: no. t166788; OCLC.

045.9

Bowles's artist's assistant in drawing, perspective, ... Containing the easiest and most comprehensive rules for the attainment of those truly useful and polite arts ... [etc.] / by the author of Bowles's Art of painting in water-colours [Carington Bowles]. - [? ed.]. - London : printed for and sold by the proprietor Carington Bowles, [1785?]. - 64, [1] p. : pl. ; 12º
NOT SEEN
In: ESTC: no. t144692 (2×).

045.10

The artists assistant in drawing, perspective, etching, engraving, metzotinto scraping, painting on glass, in crayons, and in water-colours and on silk or sattin. Containing the easiest and most comprehensive rules for the attainment of those ... arts. - The fourth ed., improved. - London : printed for R[obert] Sayer and J. Bennet, 1786. - [8], 48 p. : pl. ; 19 cm.
NOT SEEN
In: BL; ESTC: no. t122228 (4×); OCLC.

045.11

Carington Bowles's artist's assistant. Methodically digested, and adapted to the capacities of young beginners / by the author of Bowles's 'Art of painting in watercolours' [Carington Bowles]. - Corr. and greatly improved with additions. - London : printed for and sold by L. Bowles, 1787. - 64 p. : ill. ; 18 cm.
Advertisement: pp. 58–64.
§ See also the edition: London: printed and published by W. Mason, 1813.
NOT SEEN
In: OCLC (2×).

045.12

The artists assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting on glass, in crayons, in water-colours, and on silks and satins. Containing the easiest and most comprehensive rules for the attainment of those truly useful and polite arts, methodically digested, and adapted to the capacities of young beginners. - The fifth ed., improved. - London : printed for R[obert] Sayer, 1788. - VII, [1], 48 p. : front., 3 folding pl. ; 17.5 cm.
Contents: p. III.
MIP: pp. 21–32.
§ The plates are drawing examples. *Levis*: 'Two plates only, one of them being a reversed copy of one in the first edition.'
The page references in the contents are incorrect. OCLC: 'Index reprinted from the second edition, with one chapter additional. Page references incorrect, chap. II–VIII.'
Some correspondence can be found between the texts of Bowles and **Fokke 2** (Leiden 1803) [No. 106], but Fokke's text is not a straight copy.
1 –
Drypoint / Line Engraving / Line Etching / Mezzotint
2 –
Copper
In: BL; BLBS; *Bridson & Wakeman 1984*: no. B7; CCB; ESTC: no. t132318 (6×); *Levis 1912*: 88–89; OCLC (3×); RMA.

045.13

The artists assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting on glass, in crayons, in water-colours, and on silks and sattins. The art of jappaning, &c. Containing the easiest and most comprehensive rules for the attainment of those truly useful and polite arts, methodically digested, and adapted to the capacities of young beginners. - The sixth ed. improved. - Philadelphia : for Benjamin Davies, 1794. - [6], VI–VII, [1], 9–70 p. : IV folding pl. ; 17 cm.
NOT SEEN
In: BL; BLBS; ESTC: no. w001665 (2×); *Levis 1912*: 89; *Singer & Strang 1897*: no. 72.

045.14

The artist's assistant in drawing, perspective, ... painting on glass, ... and on silks and sattins ... [etc.]. - The sixth ed., improved. - London : printed for Laurie and Whittle, 1799. - VII, [1], 40 p. : IV pl. ; 19 cm.
NOT SEEN
In: BL; BLBS; ESTC: no. n030437; *Levis 1912*: 89; *Singer & Strang 1897*: no. 79.

045.15

The artist's assistant of school of science; forming a practical introduction to the polite arts, in painting ... engraving, metzotinto-scraping ... and a valuabale selection of miscellaneous secrets. - The seventh ed., improved. - London : printed for Laurie and Whittle, by J. Wright, 1801. - VII, [1], 40 p. : front., folding pl. ; 20–22.5 cm.
§ *Levis*: 'Very poor paper. Some of the plates are like those in the first edition.'
NOT SEEN
In: *Levis 1912*: 89; NSTC: no. A1774 (?); OCLC.

045.16

Bowles's Artist's assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting on glass, in crayons, and in water-colours, and on silk or sattin. - Seventh ed., corr. and treatly improved with additions. - London : printed for Carrington Bowles, [c. 1800?]. - 4 pl.
NOT SEEN
In: OCLC.

The artist's assistant; or school of science; forming a practical instruction to the polite arts : in painting, drawing, designing, perspective, engraving, colouring, &c., with ample directions for Japanning, enamelling, gilding, silvering, lacquering, &c. and a valuable selection of miscellaneous secrets. - [? ed.]. - Birmingham : printed for the proprietors ; London : sold by G.G. & J. Robinson, 1801. - XVI, 307 p. : ill. ; 23 cm.
MIP: pp. 175–194.
§ *Levis*: 'Pages 175 to 194 inclusive are devoted to etching, engraving, mezzotinto-scraping, and "Cutting on wood." These chapters or sections are based on the first edition, but somewhat extended.'
1 –
Line Engraving / Line Etching / Mezzotint
4 –
Woodcut
NOT SEEN
In: *Levis 1912*: 89; NSTC: no. A1774 (?); OCLC (4×); *Singer & Strang 1897*: no. 84.

The artist's assistant; or, school of science; ... engraving ... [etc.] / Carington Bowles. - [? ed.]. - Birmingham : printed for the proprietor, by Swinney & Hawkins ; London : sold by G.G. & J. Robinson, 1801. - XVI, 307 p. : pl. ; 23 cm.
NOT SEEN
In: *Hind 1963-1*, p. 396; NSTC: no. 3964; OCLC.

The artist's assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting on glass, in crayons, and in water-colours, and on silk or sattin/ Carington Bowles. - The eighth ed., improved. - London : printed for Laurie and Whittle, 1802.
§ See also the edition: London 1842.
NOT SEEN
In: NSTC 1, B3962; OCLC.

The artist's assistant; or school of science; forming a practical instruction to the polite arts : in painting, drawing, designing, perpective, engraving, colouring, &c., with ample directions for Japanning, enamelling, gilding, silvering, lacquering, &c. and a valuable selection of miscellaneous secrets. - [? ed.]. - London : T. Ostell, 1803. - XVI, 307 p. : pl., partly folding.
NOT SEEN
In: OCLC (2×).

Artist's assistant in drawing, perspective, etching, engraving, metzotinto-scraping, painting on glass, in crayons, and in water-colours, and on silk or sattin. - The ninth ed., improved. - London : printed for Laurie and Whittle, 1806. - VIII, 36 p. : front, folding pl. ; 20 cm.
NOT SEEN
In: OCLC.

The artist's assistant; or school of science; forming a practical instruction to the polite arts : in painting, drawing, designing, perpective, engraving, colouring, &c., with ample directions for Japanning, enamelling, gilding, silvering, lacquering, &c. and a valuable selection of miscellaneous secrets. - [? ed.]. - Birmingham : printed for T. Ostell, by Swinnery & Ferral, 1807. - XVI, 296 p. : pl., partly folding, 1 diagram ; 21–23 cm.
MIP: pp. 162–179.
§ **Hubbard 1** (London 1920) [No. 153]: 144, '1807 edition touches upon aquatinta'.
1 –
Aquatint / Crayon Engraving / Line Engraving / Line Etching / Mezzotint
NOT SEEN
In: BL; *Levis 1912*: 89; OCLC (4×); V&A.

Artist's assistant in drawing, perspective, etching, engraving, metzotinto-scraping, painting on glass, in crayons, and in water-colours, and on silk or sattin : containing the easiest and most comprehensive rules for the attainment of those truly useful and polite arts. Methodically digested, and adapted to the capacities of young beginners / [by Carington Bowles]. - The tenth ed., improved. - London : printed for Laurie and Whittle, 1809. - vi, 33, [1] p. : ill., [2] pl. folding ; 21 cm.
NOT SEEN
In: BL; OCLC.

Artist's assistant in drawing, perspective, etching, engraving, mezzotinto-scraping, painting on glass, in crayons, and in water-colours, and on silk or sattin. - [? ed.]. - Gainsborough : printed by and for H. Mozley, 1810. - 44, [3] p. : ill., pl. folded ; 18 cm.
§ OCLC: 'Label on cover: J. Dinnis'.
NOT SEEN
In: OCLC.

The artist's assistant in drawing, perspective, etching engraving metzotinto scraping, painting on glass, in crayons; in water-colours, and on silks and satins. Containing the easiest and most comprehensive rules for the attainment of those truly useful and polite arts. Methodically digested, and adapted to the capacity of young beginnners. - Twelfth ed., improved. - London : Printed for J. Whittle and R.H. Laurie, 1810. - 39, [1] p. : 4 folding engr. ; 19.5 cm.
Advertisement: p. [1].
§ *McKay*: the advertisement is 'publisher's adverts'.
NOT SEEN
In: *McKay* cat. 66: no. 390.

The artist's assistant, or new & improved drawing book; to which are added, the easiest and most comprehensive rules for the attainment of those truly useful and polite arts, etching, engraving, mezzotinto scraping, printing in water-colours, and [on?] silks and sattins; with instructions for

mixing the different shades. The whole methodically digested, and adapted to the capacities of young beginners. - [Abridged ed.]. - London : printed and published by W. Mason, [1813]. - 28 p. : folding pl. ; 20 cm.
§ BL, OCLC: 'abridgement of the ed.: London : printed for and sold by L. Bowles, 1787.
NOT SEEN
In: BL; NSTC, nos. A1776, B3964; OCLC (2×); *Singer & Strang 1897*: no. 92.

045.27

The artist's assistant. - [? ed.]. - Gainsborough : Henry Mozley, 1814
NOT SEEN
In: BL; BLBS; *Bridson & Wakeman 1984*: no. B7; *Levis 1912*: 89; NSTC: nos. A1775, B3962; *Singer & Strang 1897*: no. 94.

045.28

The artist's assistant. - Twelfth ed., improved. - London : printed for J. Whittle, 1818. - VI, [7]–39 p. : 3 folding pl. ; 21 cm.
NOT SEEN
In: BL; NSTC 2: no. 2A1717*; OCLC.

045.29

The artist's assistant. - The thirteenth ed. improved. - London : [...], 1826. - [...] p. : ill. ; 12º.
NOT SEEN
In: *Singer & Strang 1897*: no. 123.

045.30

The artist's assistant in drawing, etching, engraving, mezzotinto-scraping, painting on glass, and on silks sattins, &c. : containing the easiest and most comprehensive rules for the attainment of those truly useful and polite arts / Carington Bowles. - The eighth [sic!] ed. - London : printed for R.H. Laurie, 1842. - VI, 7–34 p. ; 19 cm.
NOT SEEN
In: BCIN.

Braun (Theo)   046

Mutative Eisenätzung : Geschichte und Einführung in die Tiefdrucktechnik der farbigen Eisenätzung / Theo Braun. - Augsburg : Die Brigg, 1973. - 94 p. : [41], ill., of which [5] in colour ; 20.5 cm.
Contents: p. 89.
ISBN 3-87101-068 [sic!] (hardcover)
§ Title means: Mutative iron etching: history (of etching iron) and introduction into colour intaglio printing by means of etched iron plates
The only manual dealing exclusively with etching iron intaglio plates.
The illustrations are photographs and reproductions.
1 –
Aquatint
2 –
Iron
3 –
Jigsaw / Multiple-plate Printing / Printing in Black / Printing Polychrome
5 –
Aesthetics / Art History / Health and Safety
In: DNB-F; KSM; OCLC (13×).

Brooks (Catherine)   047

Magical secrets about line etching & engraving / Catherine Brooks ; appendix by Kathan Brown [on printing]. - San Francisco : Crown Point Press, 2007. - 207 p. : ill., partly in colour + DVD ; 25.5 cm.
ISBN 1-891300-20-2 (hardcover)
§ The illustrations are diagrams and photographs. The DVD explains techniques by means of videos.
Review: A. Smith, in *Printmaking Today*, 17 (2008) 1: 34.
1 –
Drypoint / Line Engraving / Line Etching
3 –
Printing
5 –
Health and Safety
NOT SEEN

Brown (Alexander)
See: **Browne 1** (Alexander) [No. 048].
See: **Browne 2** (Alexander) [No. 049].

Browne 1 (Alexander)   048

The whole art of drawing, painting, limning, and etching. To which is added exact rules of proportion for drawing the heads of men, women and children, of what bigness soever / collected out of the choicest Italian and German authors ; originally invented and written by the famous Italian painter Odoardo Fialetti ; published for the benefit all ingenuous gentlemen and artists, by Alexander Brown[e]. - London : printed for Peter Stint and Simon Miller, 1660. - [6], 54 p. : front., 8 pl. ; 13.5–15 × 18.5–20 cm.
Contents: p. [5].
MIP: pp. 25–37.
Supplier: p. 36.
§ Title on frontispiece: Variety of excellent symmetricall rules of drawing, limning &c. invented by Odoardo Fialet[ti] and others
Pages 44, 46 and 48 are numbered backwards '48', '46' and '44' respectively, the opposite pages are not numbered.

The recipes for red, white and black etching ground (p. 27) are copied almost literally from **Bate** (London 1634) [No. 024]: 141. The second recipe for a red etching ground ('Another Ground', p. 28) is new. **Academia Italica** (London 1666) [No. 003] in its turn copied parts from Browne. The whole text on etching is used again in **Browne 2** (London 1669) [No. 049].

1 –
Line Engraving / Line Etching
2 –
Copper
3 –
Drawing / Painting
5 –
Aesthetics / Art History
In: *Blas Benito 1994*: 67; BL; BLBS; *Levis 1912*: 22; NUC–1956; OCLC.

Browne 2 (Alexander) 049.1

Ars pictoria: or an academy treating of drawing, painting, limning, and etching. To which are added thirty copper plates expressing the choicest, nearest and most exact grounds and rules of symmetry / collected out of the most eminent Italian, German, and Netherland authors by Alexander Browne ; [poems by P. Fisher and J.H.] ; [front.] Ia[cob] Huysmann Pinx., Ar[nold] de Iode scu. - [1st ed.]. - London : printed by J. Redmayne, for the Author, to be sold by him, and Richard Tompson, and Arthur Tooker, 1669. - [8], 110, [2] p. : front., 30 pl. ; 32 cm.
Addenda & corrigenda: p. [8].
MIP: pp. 97–110.
Contents: p. [1] at the back.
§ The text on etching is almost identical to **Browne 1** (London 1660) [No. 048]; cf. *Levis 1912*: 24. New is the paragraph on mezzotint ('The Manner or Way of Mezo Tinto', p. 110), which is the earliest published instruction for this technique. This text is copied almost literally in: **Sculptura historico-technica** (London 1747) [No. 304]: 225.
The frontispiece is a portrait of Alexander Browne by Arnold de Jode after a painting by Jacob Huysmans.
Directly after the contents follow the thirty plates, there is no separate title page. The plates are engravings, numbered '1'–'29' and do not carry the name of the engraver. Plate [30] is an unnumbered etching signed in the lower right corner 'G.R. inci.'.
Spelman 2005, cat. 56: no. 24, p. 14: 'The *Ars Pictoria* was advertised in the Mercurius Librarius in June 1669 for publication at 10 shillings bound. It was dedicated to Browne's former pupil Anne, Duchess of Monmouth and addressed to "all Ingenious Gentlemen and Artists". (Ref. National Portrait Gallery).'
The text on etching was used for the item 'Etching' in the several editions of: Lexicon technicum / by John Harris. - London : Brown, 1704–1710. Harris summarises the etching technique and gives as reference 'Browns Ars Pictoria'.
Cochin probably copied four recipes for etching ground from the present text; **Bosse** (Paris 1745) [No. 042.8]. 'The manner and way to make the ground' (p. 99) is 'IV. Autre vernis mol, traduit d'un livre Anglois' together with the instructions for recipe no. V (pp. 52–53). 'A receipt for a ground taken out of a manuscript of Collots' (p. 105) is recipe 'III. Vernis mol tiré d'un manuscrit de Callot' (pp. 51–52). 'The ground of Rinebrant of Rine' (p. 106) is recipe 'II. Vernis blanc de Rimbrant' (pp. 50–51).
Browne was drawing teacher to the wife of Samuel Pepys. He presented Pepys with a copy of Ars Pictoria on 27 May 1669: 'Presented this day by Mr. Browne with a book of drawing by him, lately printed, which cost me 20s. to him.' Note that the book was offered for sale for 10s; the difference might be because Browne would have offered a bound copy of his book. No copy of *Ars Pictoria* is present among the books in Pepys' library at Magdalene College, Cambridge University.
1 –
Line Engraving / Line Etching / Mezzotint
2 –
Copper
4 –
Drawing / Painting
In: *Blas Benito 1994*: 67; BL; BLBS; BS; DBI-VK; HAB (inc.); *Levis 1912*: 23–25; NSUG; NUC–1956; OCLC (2×); ULC; *Wing 1972–1988*: no. 5097 (9×).

049.2

[Notes]. - [S.l.], [c. 1670–1700].
In: **Browne 2** (London 1669) [No. 049].
§ Manuscript.
Language: English.
Contains a few miscellaneous notes. Owner's inscription on title page: 'Constanter. Lond. dec. 1670.' This is Constantijn Huygens (1596–1687), who may have bought it on a diplomatic mission to London. See also: **Huygens** (Den Haag 1640) [No. 157].
In: NSUG, 2º ART PLAST VII, 7965.

049.3

[Notes]. - [S.l.], [1700–1750].
In: **Browne 2** (London 1669) [No. 049].
§ Manuscript.
Language: English.
Spelman: 'there are also some pen and ink embellishments of copies of figures on the verso of several plates; signature of Hugh Henshall dated 1752, and earlier signature of Jonathan Henshall under the errata noting that he has corrected the errors in the book'.
NOT SEEN
In: *Spelman*, cat. 47 (2002): no. 3, cat. 49 (2003): no. 22, and cat. 51 (2004): no. 32.

049.4

Ars pictoria: or an academy treating of drawing, painting, limning, etching. To which are added .XXXI. copper plates, expressing the choicest, nearest, and most exact grounds and rules of symmetry collected out of the most eminent Italian, German, and Netherland authors / by Alexander Browne ; [poems by P. Fisher, J.H.] ; Ja[cob] Huijsmans pinx. ; Ar[nold] de Jode scu. - The second ed., corr. and enl. by the author. - London : printed for Arthur Tooker, and William Battersby, 1675. - [8], 110, [2] p. : front. ; 30–34 cm.
Addenda & corrigenda: p. [8].

MIP: pp. 97–110.

Contents: p. [1] at the back.

§ BL: '[The second copy is] a duplicate of the preceding, with the dedication in pt. 2 to Peter Lely replaced by one to Sir William Duce.'

Spelman 2005, cat. 56: no. 24: 'The 1675 edition for the most part repeats the 1669 edition, and the pages appear to be old stock recycled, but it adds a second part dedicated to Sir Peter Lely, who must have been a regular customer at Browne's shop.'

– Appendix: An appendix to the art of painting in miniature or limning: directing the choisest, safest, and nearest way to attain to perfection in the said art; with all the several mixtures and temperatures of the colours for every several work, and the manner of laying the ground-colours, and how to highten and deepen upon them; and directions for drawing of history in limning, with several proper observations. And also the several ways of making cryons or pastils, with the several ways of working with them / by Alexander Browne ; A. Blomert [= Abraham Bloemaert], L. Carats [= Lodovico Carracci], I. Collenbina [= Gaspare Colombina?], J[acopo] Palma, F. Parmesan [= Francesco Mazzola, gen. Parmigianino], Polidoro Caravaggio invent. ; Ar[nold] de Jode sculp. - Never published before. - London : printed for Arthur Tooker and William Battersby, 1675. - [4], 39, [2] p. : [1], 29, [1] pl. ; 32 cm.

Addenda & corrigenda: p. 39.

Supplier: p. 39.

Contents: p. [1] at the back.

List of prints sold by Arthur Tooker: p. [2] at the back.

§ The same thirty plates as in the 1669 edition, this time with a letterpress title page and one extra plate. *Levis* notes that in all the copies he has seen the same plates are present, but that the numbering of the plates varies.

Published before as: A compendious drawing-book : collected from the drawings of the most celebrated painters in Europe / composed by Alexander Browne ; engraven by Arnold de Jode, and others. - London : printed for Austin Oldisworth, [1669 or before].

A later edition in OCLC: [London]: Printed for Austin Oldisworth, [1677?].

In: BL (2×); *Blas Benito 1994*: 67; CCB; DBI-VK; KCA; *Levis 1912*: 22–25, 555; MET; NG; NUC1956; OCLC; RMA; *Singer & Strang 1897*: nos. 21–22; *Wing 1972–1988*: no. 5098 (9×).

Brugghen (Gerard ter) 050.1

Verlichtery kunst-boeck : inde welke de rechte fondamenten, ende het volcomen gebruyck der illuminatie met alle hare eygenschappen klaerlijcken werden voor oogen gestelt / ghemaeckt door den voortreffelijcken kunst-verlichter Gerard ter Brugghen ; [sculp. Claes Jansz. Visscher]. - Amsterdam : by Herman Allersz. Koster, 1616. - Fol. A-C8D4 [= 56 p.] : woodcut title ; 15 cm.

MIP: fol. D3r-D4r.

§ Title means: Treatise about illumination: in which the right principles, and the complete use of illumination with all its properties is clearly shown

The authorship of the part on etching is disputed. Because Ter Brugghen is not known as an etcher it is suggested that the text was written by Marcus Gheeraerdts Sr; *Bosters 1989*, pp. 112–113. Gheeraerdts Sr indeed made etchings, but he was active in the southern Netherlands and England and died after 1590. His son, Marcus Gheeraerdts Jr, is known as a painter and was also active in the southern Netherlands and England. Chris Schuckman suggested instead that the engraver Claes Jansz. Visscher, who was active in Amsterdam, cut the decorative frame for the title page and wrote the text on etching.

Printing: Amsterdam: ghedrukt by Paulus van Ravesteyn, 1616.

The first and main part is the oldest Netherlands monograph on painting in watercolours. The second part is the oldest Netherlands instructive text on making an etching. The part on watercolours is known through many editions and reworked versions. The part on etching is found in the editions 1616, 1634 and 1667

The complete treatise is copied in the manuscript by Jacoba van Veen: 1650–1660 [No. 050.3].

The first recipe on etching ground, acid and etching (fol. D3r–v) is more or less the same as a similar recipe in: **Overbeke** (?1650–1700) [No. 225]: fol. 25r–v.

1 –

Line Etching

2 –

Copper

3 –

Ink

4 –

Painting

In: CCB; NCC; RMA (missing); UBA.

050.2

Verlichtery kunst-boeck : in de welke de rechte fondamenten, ende het volcoomen ghebruyck der illuminatie met alle hare eyghenschappen klaerlijcken werden voor oogen ghestelt / ghemaeckt door Gerard ter Brugghen. - Leyden : Jacob Roels, 1634. - Fol. A–C8D4 [= 56 p.] ; 16 cm.

MIP: fol. D3r–D4r.

§ The text is identical, but has been reset.

In: BL; BLBS; NCC; UBA.

050.3

De wetenschap van de manieren om alderhande couleuren van say of sayetten te verwen etc. / compiled by Jacoba van Veen. - [Den Haag?], [1650–1660]. - II, 454 p. ; 20 cm.

MIP: pp. 205–208.

§ Title means: The science of the manners of dyeing silk in all kinds of colours etc.

Manuscript.

Language: Dutch.

Volume with art technological and household recipes. Contains a copy of the text from the edition: **Brugghen** (Amsterdam 1616) [No. 050.1], or **Brugghen** (Leyden 1634) [No. 050.2]. The copy is close to the original. The part on etching ground, printing ink and printing is rendered in a different order: first is the printing ink (pp. 205–206), then preparing acid and etching ground (pp. 207–208).

Little more is known about Jacoba van Veen (fl. 1650–1660) other than that she is a grand-daughter of the painter Pieter van Veen (1563–1629) who worked in Den Haag.

In: KB, Ms. 135 K 44.

Verlichtery kunst-boeck, in de welcke de rechte fondamenten, ende het volkoomen ghebruyck der illuminatie met alle hare eyghenschappen klaerlijcken werden voor oogen ghestelt / ghemaeckt door Gerard ter Brugghen. - Den laetsten druck vermeerdert en verbetert. - Amsterdam : voor Jan Hendricksz. de de Vries, 1667. - Fol. A-E8 ; 15 cm.
MIP: fol. E2v-E3v.
§ With a new title page. The text has been reset and slightly modernised. New text on fol. E4r-E7v. Fol. C5 is marked as B5. Fol. E8 is blank.
1 –
Line Etching
2 –
Copper
3 –
Ink
4 –
Nature Printing / Painting
In: CCB; NCC; RKD; UBA.

Hollandse etsrecepten vóór 1645 / door J[an] G[errit] van Gelder.
In: Oud Holland. - Vol. 56 (1939). - P. 113–124.
MIP: pp. 117–118.
English summary: p. 124.
With literature.
§ Title means: Dutch etching recipes before 1645
Transcription of the part on etching in the edition Amsterdam 1616: pp. 117–118.
Discussed together with Gerard ter Borch's manuscript, see: **Borch** (Zwolle 1632) [No. 041].
1 –
Line Etching
2 –
Copper
3 –
Ink
In: RKD; RMA; UBL.

Heliogravure : technische handleiding / Jan de Bruin ; voorwoord Fred Sötebeer. - Dokkum : Kalamiteit, 1980. - 71 p. : 36, [15] ill. ; 21.5 cm.
Literature: p. 71.
§ Title means: Photogravure: technical manual
The preface is dated, p. 5: 'juni 1980'.
The illustrations are diagrams, photographs and reproductions.
1 –
Photomechanical Etching
2 –
Copper
3 –
Printing in Black
In: Priv.Coll. (2×).

The technique of etching and engraving / John Brunsdon ; [photogr. Leslie Wilson]. - [1st ed.]. - London : Batsford, 1965. - 152 p. : 68 diagrams, 40 photogr. & reprod. ; 25.5 cm.
Contents: p. 5.
Suppliers: p. 113.
Literature: p. 116.
Index p. 149.
§ Acknowledgment dated: Woburn 1965.
The diagrams are entered into the text, the photographs and reproductions are in between pp. 116 and 149.
1 –
Aquatint / Collagraph / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Photomechanical Etching / Mezzotint / Relief Etching / Soft-ground
2 –
Aluminium / Copper / Steel / Steelfacing / Zinc
3 –
Casting / Chine Collé / Ink / Jigsaw Print / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Viscosity Colour Printing
4 –
Linocut / Lithography / Screen Printing / Troubleshooting / Woodcut / Wood Engraving
5 –
Art Dealing / Conservation and Restoration
In: *Blas Benito 1994*: 75; BL; BLBS; BN; *Figueras Ferrer 1992*: 1034; OBA; GDH; NCC; OCLC (13×); RAA; ULC.

The technique of etching and engraving / John Brunsdon ; [photogr. Leslie Wilson]. - [1st ed.] - New York : Reinhold, 1965. - 152 p. : 68 diagrams, 40

photogr. & reprod. ; 25.5 cm.
Contents: p. 5.
Suppliers: p. 113.
Literature: p. 116.
Index: p. 149.
Stocklist: back flap.
In: OCLC (14×); Priv.Coll. (2×).

052.3

The technique of etching and engraving / John Brunsdon ; [photogr. Leslie Wilson]. - Repr. - London : Batsford ; New York : Reinhold, 1967. - 152 p. : 68 diagrams, 40 photogr. & reprod. ; 25.5 cm.
Contents: p. 5.
Suppliers: p. 113.
Literature: p. 116.
Index p. 149.
Stocklist: back flap.
In: *Blas Benito 1994*: 75; OCLC (25×); Priv.Coll.

Buckland-Wright (John) 053.1

Etching and engraving : techniques and the modern trend / by John Buckland-Wright ; preface by John Piper. - First published. - London : The Studio Limited ; New York : The Studio Publications, 1953. - I–xi, 12–240 p. : front., [158] reprod. ; 25.5 cm.
Contents: p. v.
List of illustrations: p. vii.
MIP: pp. 15–171.
Index on artists: p. 240.
Stocklist: backside of the paper cover.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Relief Etching / Soft-ground / Stipple Engraving
2 –
Copper / Iron / Zinc
3 –
Casting / Ink / Multiple-plate Printing / Press / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Woodcut / Wood Engraving
5 –
Art History
In: BL; *Blas Benito 1994*: 75; BNB50; BNM; CCB; *Figueras Ferrer 1992*: 1034; KABK; KB; KVB; MBvB; NCC; NUC–1956; OBA; OBDH; OCLC (12×); OBU; PBM; Priv.Coll. (4×); RAL; RMA; SMA; TUD; UBA (3×); UBAB; UBG; UBL-KHI; UBU; ULC.

053.2

Etching and engraving : techniques and the modern trend / by John Buckland-Wright ; preface by John Piper. - Unabridged and unaltered repr. - New York : Dover ; Toronto : General Publishing Company ; London : Constable and Company, first published 1973. - [2], I–xi, 12–240, [11] p. : front., [157] reprod. ; 23.5 cm.
Contents: p. v.
List of illustrations: p. vii.
MIP: pp. 15–171.
Index on artists: p. 240.
Stocklist: inside front- and backcover, p. [3] at the back.
ISBN 0-486-22888-6 (softcover)
§ Photomechanical reprint of: London 1953 [No. 053.1].
In: BIP+; *Blas Benito 1994*: 75; MMW; NCC; OCLC; Priv.Coll.; SBH.

053.3

Etching and engraving : techniques and the modern trend / by John Buckland-Wright ; preface by John Piper. - Magnolia, Mass. : Smith, 1973. - I–xi, 12–240, [11] p. : front., [158] reprod. ; 25.5 cm.
Contents: p. v.
List of illustrations: p. vii.
MIP: pp. 15–171.
Index on artists: p. 240.
Stocklist: p. [3].
ISBN 0-8446-4714-4 (hardcover)
§ Hardcover school edition of: New York 1973.
In: Priv.Coll.

Buonaccorsi (Giorgio von) 054

Radierung und Kupferstich. Eine Anleitung für Anfänger und Fortgeschrittene / von G[iorgio] von Buonaccorsi. - Ravensburg : Maier, [1916]. - VIII, 150, [2] p. : front., 14 Fig., [12] reprod., II Taf. ; 20–21 cm.
Contents: p. V.
Literature: p. 139.
Glossary & index: p. 144.
Advertisement: p. [1].
Stocklist: backside cover.
§ Title means: Etching and engraving. A manual for beginners and more experienced

The dedication is dated, p. III: 'Im November 1916'.
See also: **Buonaccorsi** (1913) [No. 403].
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Copper / Steelfacing
3 –
Chine Collé / Hand-colouring / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Monotype / Screen Printing
5 –
Art History / Conservation and Restoration
In: DBI-LINK; DNB-L; CCB; DBI-VK; GLVA; OBDH; Priv.Coll. (2×); UBAB.

Buonanni (Filippo)   055.1

Trattato sopra la vernice detta communemente cinese / Filippo Bonanni. - [1st ed.]. - Roma : per Giorgio Placco e Gettatore di Caratteri, 1720. - 16, 142 p. : 4 fig. ; 18 cm.
Contents: p. 14 at the beginning.
MIP: pp. 82–88 : fig. 3.
§ Title means: Treatise on the varnish commonly called Chinese
Filippo Bonanni is Buonanni, Filippo.
Imprimatur by Michael Angelus Tamburinus, p. 11: 'Romae 20. Martii 1720'.
Imprimatur by Giovanni Bortoni, p. 12: 'Dal Quirinale a di 1. Giugno 1720'.
P. 13 at the beginning is numbered '31'.
Recipes for etching grounds and acids derived from **Bosse** (Paris 1645) [No. 042.2]: p. 83.
Title description after microfilm.
1 –
Line Etching
2 –
Copper / Iron
In: BL; BLBS; BN; DBI-VK; NUC–1956; OCLC; *Schießl 1989*: no. 913.

055.2

Trattato sopra la vernice ... [etc.] / Filippo Bonanni. - [2nd ed.]. - Roma : Antonio de'Rossi, 1731. - XII, 142 p. : 4 ill.
NOT SEEN
In: BN; NUC–1956; OCLC.

055.3

Trattato sopra la vernice ... [etc.] / Filippo Bonanni. - [3rd ed.]. - Bologna : per le Stampe di Lelio dalla Volpe, 1786. - 96 p. ; 8º
NOT SEEN
In: BL; BN; OCLC; SBS.

055.4

Traité des vernis, où l'on donne la maniere d'en composer un, qui ressemble parfaitement à celui de Chine, & plusieurs autres qui concernent la peinture, la dorure, la gravure à l'eau forte, &c. / [le Reverend Pere Bonanni Jesuite] ; [transl. from the Italian]. - [1st ed.]. - Paris : chez Laurent d'Houry, 1723. - [12], 207 p. : 4 fig. ; 16 cm.
Contents: p. [3].
MIP: pp. 120–129 : fig. 2.
Addenda & corrigenda: p. 207.
§ Title means: Treatise on varnish, in which one gives the manner to compose one, which resembles the Chinese perfectly, and many other concerning painting, gilding, etching, etc.
The approbation is dated, p. [6]: 'Fait à Paris ce 27. Mars 1723'.
The royal privilege is dated, p. [8]: 'Donné à Paris le quinziéme jour du mois d'Avril l'an grace 1723. & de notre Regne le huitiéme'.
Registered, p. [8]: 'A Paris le 31. May 1723'.
The figures are etchings and faithful copies after the originals.
The etching recipes are given with reference to **Bosse** (Paris 1645) [No. 042.2].
In: NUC–1956; RKD; *Schießl 1989*: no. 913.

055.5

Traité des vernis ... [etc.] / Pater Buonanni ; traduit von A.J. Dézallier d'Argenville. - [2nd ed.]. - Paris : Imprimerie de la Veuve Laurent d'Houry, 1733. - VIII, 205, [3] p. ; ill.
NOT SEEN
In: BL; BLBS; NUC–1956.

055.6

Traité de la composition des vernis en géneral ... [etc.] / Filippo Buonanni. - [3rd ed.]. - Paris : Chez Nyon l'ainé, 1780. - VIII, 205 p.
Although this edition seems to have been published in Den Haag ('La Haye'), no copy could be traced in any public library in the Netherlands, unless a town La Haye in France is meant. NOT SEEN
In: DBI-VK; NUC–1956; V&A.

055.7

Traité de la composition des vernis en géneral ... [etc.] / Filippo Buonanni. - La Haye [= Den Haag?] : chez les Libraires Associés, 1802. - [4th ed.]. - VIII, 205 p. ; 18 cm.
NOT SEEN
In: NUC–1956; V&A.

Neuer Tractat von Firniß-, Laquir- und Mahler-Künsten / nach dem Original des berühmten pater Bonanni in Rom ; vermehrt ans Licht gestellet von J.J. R[embold]. - [1st ed.]. - Berlin ; Leipzig : [Rembold?], 1727. - 144 p. : 4 Taf. ; 8°.
§ Title means: New treatise of varnish, lacquer and painting arts
NOT SEEN
In: DBI-VK; KVK; *Schießl 1989*: no. 913.

Neuer Tractat von Firniß-, Laquir- und Mahler-Künsten / von Pater Bonani ; ans Licht gestellet von J.J. R[embold]. - Zweyte und vermehrte Aufl. - Berlin ; Leipzig : bey J.J. Rembold, 1730. - 160 p. : IV Fig.
NOT SEEN
In: KVK; NUC–1956; *Schießl 1989*: no. 914.

Neuer Tractat von Firniß-, Laquir- und Mahler-Künsten / von Pater Bonani ; ans Licht gestellet von J.J. R[embold]. - [3rd ed.]. - Berlin ; Leipzig : bey J.J. Rembold, 1735. - 160 p. : ill.
NOT SEEN
In: KVK; *Schießl 1989*: no. 915.

Neuer Tractat von Firniß-, Laquir- und Mahler-Künsten / von Pater Bonani ; ans Licht gestellet von J.J. R[embold]. - Vierte und vermehrte Aufl. - Breslau : Daniel Pietsch, 1744. - 160 p. : 4 ill. ; 8°
NOT SEEN
In: KVK; *Schießl 1989*: no. 916.

Neuer Tractat von Firniß- Laquir- und Mahler-Künsten, nach dem Original des berühmten Pater [Filippo] Bonani [= Buonanni]. Mit vielen neuen Arcanis, unterschiedlichen Beschreibungen des Gummi Copal und Bernsteins, deren Eigenschaften, Praeparation und Auflösung zu Firnissen etc. vieler Gummaten Tugenden auch andern nützlich- und curieusen Anmerckungen / ans Licht gestellet, von J.J. R[embold]. - Und bey dieser fünften Aufl. mit einem Anhange eines wohl approbirten Processes zum Lacquiren vermehret. - Breßlau ; Leipzig : bey Daniel Pietsch, 1746. - 160 p. : IV Fig. ; 18 cm.
Contents: p. 3.
MIP: pp. 93, 95–98 : Fig. II.
§ The *Figuren* are etchings.
Recipes for etching grounds and acids derived from **Bosse** (Paris 1645) [No. 042.2], see p. 93, n. 1.
– Appendix: Ein wohl approbirter Process zum Laquiren, als ein Anhang zu des berühmten Pater [Filippo] Bonani [= Buonanni] Tractat von Firniß- Laquir- und Mahler-Künsten / zum Erstenmal ans Licht gegeben von einem Liebhaber [J.J. Rembold?] dieser Kunst. - Breßlau ; Leipzig : Daniel Pietsch, 1746. - 38 p. ; 18 cm.
In: BN; BS; CCB; DBI-VK; GV; KVK; NSUG; NUC–1956; *Schießl 1989*: no. 917; UBA.

Neuer Tractat von Firniß-, Laquir- und Mahler-Künsten / von Pater Bonani ; [ans Licht gestellet] von J.J. R[embold]. - 6. Aufl. - Breßlau ; Leipzig : Daniel Pietsch, 1753. - 160, 38, [8] p. : ill.
NOT SEEN
In: BL; BLBS; KVK; *Schießl 1989*: no. 918.

Verhandeling over de vernissen, waar in de wyze opgegeeven wordt, om 'er een toe te stellen, dat 't Chineesch vernis volmaakt gelykt : benevens verscheyde andere zaken rakende de schilderkunst, 't vergulden, 't etsen, etc. / in 't Italiaansch beschreeve [by Bonnani (= Filippo Buonanni)] ; en nu uyt de Fransche in de Nederduytsche taal overgebragt. - [1st ed.]. - Leyden : Jacobus Willeke, 1742. - 16, 218, [24] p. : [4] Fig. ; 17.5 cm.
Contents: p. 11 at the beginning
MIP: pp. 125–135 : Fig. 2.
Index: p. [1].
Addenda & corrigenda: p. [24].
With literature.
§ Title means: Treatise on the varnishes, in which the way is given, to make one which equals the Chinese varnish: as well as several other affairs concerning painting, guilding, etching, etc.
Probably a translation of the edition: Paris 1733.
With comments on Buonanni's text by both the French and the Dutch translators.
The recipes are seen as a form of amusument: p. 3 (Dutch translator), p. 8 (French translator).
In: CCB; UBL-KHI; RMA.

Zeer korte en teffens klaare beschryving van de chineese vernis, de wyse om deselve te beryden, en met goed succes te gebruyken, benevens verscheide andere vernissen / te saamen gebragt uyt verscheide soo Grieksche als Latynsche schryvers, door een voornaam liefhebber der schilderkonst [Filippo Buonanni]. - [2nd ed.]. - Leyden : by Cornelis de Pecker, 1756. - 16, 218, [24] p. : [4] pl. ; 16.5 cm.
Contents: p. 11 at the beginning
MIP: pp. 125–135 : 1 pl.
Index: p. [1].
Addenda & corrigenda: p. [24].
With literature.
§ Title means: Very short and also very clear description of the Chinese varnish, the way to prepare the same, and to use it with success, as well as several other varnishes
A re-edition using old stock. The title page has been reset and printed separately. Type and watermarks of the rest of the text are identical to the first edition.
In: DBI-VK; RKD; RMA.

Tratado de barnices y charoles / [Filippo Buonanni]. - [1st ed.]. -Valencia : Joseph Estevan, 1735. - […] p. : ill. ; 20 cm.
MIP: part 1, chapter 12.
§ Title means: Treatise on varnishes and lacquers
NOT SEEN
In: *Figueras Ferrer 1992*: 1035.

Tratado de barnices y charoles : enmendado, y añadido en esta segunda impression de muchas curiosidades, y aumentado al fin con otro de miniatura para aprender facilmente á pintar sin maestro, y secreto para hacer los mejores colores, el oro bruñido y en concha / [Filippo Buonanni] ; traducido del idioma frances al castellano por Francisco Vicente Orellana. - [2nd ed.]. - Valencia : en la Imprenta de Joseph García ; se hallara en la libreria de Manuel Cabero y Cortès, 1755. - [26], 252 p. : ill. ; 21 cm.
NOT SEEN
In: BNM; *Figueras Ferrer 1992*: 1061; NUC–1956.

Tratado de barnices y charoles : enmendado, y añadido en esta segunda impression de muchas curiosidades, y aumentado al fin con otro de miniatura para aprender facilmente á pintar sin maestro, y secreto para hacer los mejores colores, el oro bruñido y en concha / [Filippo Buonanni] ; traducido del idioma frances al castellano por Francisco Vicente Orellana. - [Photom. repr.]. - Valladolid : Maxtor, [2006]. - [28], 252 p. ; 21 cm.
NOT SEEN
In: BNM.

Bylaert (Joannis Jacobus)   056.1

Nieuwe manier om plaet-tekeningen in 't koper te brengen, van een, twee of meer couleuren, soo datse de natuur van tekeningen behouden, al schoon dezelve op eene ordinaire plaet-perse gedrukt worden = Nouvelle maniere de graver en cuivre des estampes coloriées; de façon que, quoiqu'imprimées dans une presse ordinaire, elles conservent l'air & le caractère du dessin / aengetoond en uitgevoerd door Joannis Jacobus Bylaert = demontrée et executée par Jean Jacques Bylaert ; traduit du Hollandais par L[odewijk] G[abriël] F[lory] Kerroux. - Leiden : by Sam. & Joh. Luchtmans, 1772. - 77, [1] p. : pl. A-B, folding, partly in colour ; 20.5–23 cm.
§ Title means: New manner to bring drawings into copper, with one, two or more colours, in order to reproduce drawings, although they are printed on a common roller press
Dedication to stadtholder Willem V, p. 6: 'Leyden Jan. 1772'.
Every opening with Dutch text on the left and French text on the right on facing pages.
Plate A is printed in black. Plate B is printed from two copper plates, one in brown for the upper part and one in black for the lower part.
This Dutch publication gained some renown in international studies on colour printing and on printmaking, because it was bilingual (Dutch–French), and because it was translated into German.
Meynier (Hof 1804) [No. 208]: 3, was not so positive about this publication: 'Enthält theils sehr langsame Methoden, durch welche nichts Schönes und Kräftiges zu Wege gebracht werden kann, theils ganz alberne und durchaus nicht auf Erfahrung gegründete Handgriffe.'
1 –
Aquatint / Crayon Engraving / Crayon Etching
2 –
Copper
3 –
Ink / Multiple-plate Printing / Printing in Black / Printing Monochrome / Printing Polychrome
5 –
Aesthetics / Art History
In: BL; BLBS; BN; CCB; DBI-VK; KB; MBvB (3×); MET; MVvG; NCC; NG; NSUG; NUC–1956; OCLC; ÖNB; RMA; *Singer & Strang 1897*: nos. 60–61; UBA; UBG; UBH; UBL; UBN; UBU, KHI.

056.2

Neue Manier Kupferstiche von verschieden Farben zu verfertigen nach Art der Zeichnungen / von Johann Jakob Bylaert ; aus dem französischen und holländischen übersetzt ; [front. and pl. by the anonymous transl.]. - Amsterdam ; Leipzig : bey Johann Schreuder, 1773. - [2], VI, 80 p. : front., pl. A-B., folding, partly in colour ; 16–17 cm.
§ Title means: New manner to make engravings in various colours in order to reproduce drawings
Translation of the edition: Leiden 1772.
P. VI is numbered 'IV'.
Only a small number of copies are printed: pp. V–VI.
The frontispiece is newly made in Bylaert's stipple engraving technique by the anonymous translator and printed in red-brown. Plates A and B are copied after the originals. Plate A is printed in black. Plate B is printed from two copper plates, one in red-brown for the upper part and one in black for the lower part.
In: ABK; *Blas Benito 1994*: 67; DBI-VK; *Figueras Ferrer 1992*: 1031; HAUM; NCC; ÖNB; SBB; *Singer & Strang 1897*: no. 62; UBA.

C

C. (C.I.C.A.L.)
See: **C.I.C.A.L.C.** [No. 057].

C. (J.F.A.)
See: **J.F.A.C.** [No. 160].

Der nützliche und curiöse Künstler, oder neu- und wohl approbirtes Haus- und Kunst-Buch, aus welchem nicht nur allein Mahler, Bildhauer, Kupfferstecher, Goldschmiede, Wachs-Boßierer, Illuministen, etc. sondern auch andere in ihren Professionen scharff-nachsinnende und Kunst-liebende Gemüther; als da sind Jubelirer, Goldschlager, Glocken- und Stückgiesser, Glaß- Stein- und Eisenschneider, Lacquirer, Fürnis-Sieder, Silber- Bein- und Holtz-Drechsler, Schreiner, Cattundrucker, Kunst- und andere Färber, Buchbinder- Spiegel- Futteral- und Spanisch-Wachsmacher, Kriegs- Schiff- und allerhand Bauleute, Weinhändler, Wirth und Methsieder etc. Eine gute Wissenschafft von sehr vielen bewahrten und approbirten Kunst-Stücken heben und erlangen können. Endlich haben auch sorgfältige Hauß-Vätter und Hauß-Mütter viel Gutes und Nützliches darinnen zu ersehen und zu begreiffen / aus Christ-schuldigster Liebe mitgetheilet und zum Druck befördert von C.I.C.A.L.C. - Nürnberg : Verlegts Sebastian Trautner, 1728. - [11], 800, [64] p. : front ; 17.5 cm.
MIP: pp. 793–800.
Index: p. [1] at the back.
§ Title means: The useful and curious artist, or new and well tried house and art book (etc.)
1 –
Line Engraving / Line Etching
2 –
Copper
In: Priv.Coll.; *Schießl 1989*: no. 41.

Cantón (F.J. Sánchez)
See: **García Hidalgo** (José) [No. 115].

The carborundum print : a circular describing a new process for print makers suitable for black and white or color, with instructions on the preparation of the ground and method of printing / foreword by F. C. Harrington. - Washington, D.C. : Federal Works Agency Work Projects Administration, 1940. - [2] p., 11, [5] fol. : 5 pl ; 26.5–27 cm. - (W.P.A Technical Series ; Art Circular no. 5)
§ Federal Works Agency Work Project Administration was a division of Professional and Service Projects.
1 –
Carborundum Print / Mezzotint
2 –
Copper
3 –
Multiple-plate Printing / Printing in Black / Printing Polychrome / Relief Printing
In: MET; UAL.

Primera parte del arte de escrivir todas formas de letras / escrito, y tallado por Ioseph de Casanova ; [pl. engr. by Juan de Casanova], [portrait by] Pedro de Villafranca inven. y esculp. - Madrid : Diego Díaz de la Carrera, 1650. - [6], 58 p. : portrait, [30] engr. ; [c. 29] cm.
MIP: prologo p. [2].
§ Title means: First part of the art of writing all letter forms
The frontispiece is dated: 'Madrid 1649'.
The frontispiece shows a portrait of Juan de Casanova.
Pp. 20–37, 44–55 contain examples of calligraphy.
Title description after partial photocopy.
Digital reprint: Madrid 1999 [No. 059.2].
1 –
Line Engraving
2 –
Copper
4 –
Calligraphy
In: BNM.

Primera parte del arte de escrivir todas formas de letras / Ioseph de Casanova. - Madrid : Fundación Histórica Tavera, Digibis, 1999. - [1] CD-ROM ; 12 cm. - (Textos clásicos sobre la Historia de la Ortografía Castellana Clásicos Tavera ; 26. Serie VIII, Lingüística y antecedentes literarios de la Península Ibérica ; 10).
Digital reprint of: Madrid 1650 [No. 059.1].
ISBN 84-89763-50-X
NOT SEEN

Etching described and simplified, with progressive illustrations / by a practical engraver [C. Castle] ; [plates by C. Castle]. - London : W.S. Orr, 1849. - 24 p. : III pl. ; 17–18 cm.
Supplier: p. 22.
1 –
Drypoint / Line Etching
2 –
Copper / Steel
5 –
Aesthetics
In: *Bridson & Wakeman 1984*: no. B19; *Levis 1912*: 104, suppl. p. 11; OCLC (2×); NUC–1956 (2×); *Singer & Strang 1897*: no. 199.

Castro y Velasco (Antonio)
See: **Palomino de Castro y Velasco** (Antonio) [No. 230].

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Catafal (Jordi) & **Oliva** (Clara)   061.1
</div>

El grabado / Jordi Catafal, Clara Oliva ; [history of engraving] Ramón Serra ; [photogr.] Nos & Soto ; [ill.] Jaume Farrés. - [1st ed.] - Barcelona : Parramón, 2002. - 160 p. : [606] colour ill. ; 31 cm. - (Colección Artes y oficios).
Glossary: p. 156.
Literature: p. 160.
ISBN 84-342-2480-1 (hardcover?)
§ Title means: Engraving
NOT SEEN
In: BNM.

<div align="right">

061.2
</div>

El grabado / Jordi Catafal, Clara Oliva ; [history of engraving] Ramón Serra ; [photogr.] Nos & Soto ; [ill.] Jaume Farrés. - [2nd ed.]. - Barcelona : Parramón, [c. 2005?]. - 160 p. : [606] colour ill. ; 31 cm. - (Colección Artes y oficios).
ISBN 978-84-342-2480-3 (hardcover?)
NOT SEEN

<div align="right">

061.3
</div>

El grabado / Jordi Catafal, Clara Oliva ; [history of engraving] Ramón Serra ; [photogr.] Nos & Soto ; [ill.] Jaume Farrés. - [3rd ed.]. - Barcelona : Parramón, 2007. - 160 p. : [606] colour ill. ; 31 cm. - (Colección Artes y oficios).
ISBN 978-84-342-2480-3 (hardcover?)
NOT SEEN

<div align="right">

061.4
</div>

La gravure / Jordi Catafal, Clara Oliva ; Michel Hourst, Sabine Wyckaert-Fetick [transl., eds.]. - [Paris] : Gründ, 2004. - 160 p. : ill. ; 31 cm. - (Artisanat et traditions).
ISBN 2-7000-2082-0 (hardcover)
ISBN 978-2-7000-2082-3 (hardcover)
NOT SEEN
In: BNP.

<div align="right">

061.5
</div>

A gravura / Jordi Catafal, Clara Oliva ; tradução Rita Silva ; história da gravure Ramón Serra ; fotografias Nos & Soto ; ilustrações Jaume Farrés. - Lisboa : Estampa, 2003. - 160 p. : [606] colour ill. ; 31 cm. - (Colecção artes e ofícios).
Contents: p. 4.
MIP: pp. 50–113, 132–151 : [366] ill.
Glossary: p. 156.
Literature: p. 160.
ISBN 972-33-1931-4 (hardcover)
§ Title on front cover: A gravura. A técnica e os procedimentos em relevo, em cavado e por adição explicados com rigor e clareza
The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Carborundum print / Collagraph / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Aluminium / Copper / Iron / Plastic / Zinc
3 –
Chine Collé / Jigsaw Print / Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Linoleum Cut / Woodcut / Wood Engraving
5 –
Art History / Health and Safety / Original and Reproduction
In: Priv.Coll.

<div align="right">

061.6
</div>

Het complete handboek etsen en andere grafische technieken / Jordi Catafal, Clara Oliva ; [photogr. Nos & Soto] ; [ill. Jaume Farrés] ; [transl. Anna Eijkelboom] ; [ed.: Jos Breuring]. - [1st ed.]. - Baarn : Tirion Art, 2007. - 160 p. : [606] colour ill. ; 31 cm.
Contents: p. 4.
Glossary: p. 156.
Literature: 160.
ISBN 978-90-4391-046-0 (hardcover)
§ Translation of: Barcelona 2007.
In: KB; NCC.

<div align="right">

061.7
</div>

Het complete handboek etsen en andere grafische technieken / Jordi Catafal, Clara Oliva ; [photogr. Nos & Soto] ; [ill. Jaume Farrés] ; [transl. Anna Eijkelboom] ; [ed.: Jos Breuring]. - [2nd ed.]. - Baarn : Tirion Art, [2010]. - 160 p. : [606] colour ill. ; 31 cm.
Contents: p. 4.
Glossary: p. 156.
Literature: 160.
ISBN 978-90-4391-046-0 (hardcover)
§ Republished at reduced price.
In: KB; Priv.Coll.

NB: the various editions, reworked versions, translations and reprints after or containing Cellini's *Due Trattati* are placed in chronological order only instead of ordering them chronologically by language, as is common with the other titles in the Bibliography, because after the initial edition, all following publications can be seen as scholarly studies of Cellini's texts rather than as continuing editions of his practical manual.

062.1

Due trattati / Benvenuto Cellini. - [Firenze], [1565–1567].
§ Manuscript.
Language: Italian.
The unedited text of the ms. was first published by Milanesi: Firenze 1857 [No. 062.13].
1 –
Line Etching
2 –
Copper
4 –
Goldsmithing / Sculpture
NOT SEEN
In: BMa, Ms. Marciana cod. 5134.

062.2

Due trattati. Uno intorno alle otto principali arti dell'oreficeria. L'altro in materia dell'arte della scultura; dove si veggono infiniti segreti nel la vorar le figure di marmo, & nel gettarle di bronzo / composti da Benvenuto Cellini ; [ed.] Gherardo Spini ; [poems by] Benedetto Varchi … et al.]. - Fiorenza [= Firenze] : par Valente Panizzij, & Marco Peri, 1568. - [6], 61, [7] fol. : vign. ; 20.5–23 cm.
Index: fol. [2r] at the beginning.
MIP: fol. 43v–44r.
Poems on Cellini's sculptural work: fol. [1]–[7] at the back.
§ Title means: Two treatises. One about the eight principal arts of goldsmithing. The other about the art of sculpture; containing numerous secrets about shaping figures in marble, and casting in bronze
Dedication, fol. [2v] at the beginning: 'Di Fiorenza adi 26 di Febbraio MDLXVIII.' Fol. [7r] at the back: 'In Fiorenza Appresso Valente Panizij & Marco Peri Compagni MDLXVIII.'
The illustrations are a large woodcut on the title page and woodcut historised initials at the start of each chapter.
Some mistakes in foliation: fol. [1] is possibly numbered '3'; fol. [26] is numbered '29'; fol. [33] is unnumbered; fol. [35] is numbered '33'; fol. 46 is correctly numbered '46' and fol. [47] is numbered '46[bis]'; fol. 51 is numbered '47[bis]', fol. 52 is unnumbered; fol. 61 is numbered '47[ter]'.
The chapters of this first edition are not numbered; this is only done with later editions.
This volume contains the oldest published instructions on etching a copper intaglio printing plate.
For the manuscript on which this publication was based see: Firenze 1565–1567 [No. 062.1].
Photomechanical reprint: Modena 1983 [No. 062.34].
In: BL (3×); BNP; BNM; *Brinckmann 1867*: 39 (see [No. 062.14]); KB; KSM; NCC; NSUG; RMA; *Scarpellini 1967*: XXVI (see [No. 062.27]); UBU; ULC (2×).

062.3

Due trattati di Benvenuto Cellini scultore fiorentino, uno dell'oreficeria l'altro della scultura. - Firenze : nella stamperia di S.A.R. Per li Tartini, e Franchi, 1731. - XXXII, 162, 13, [1] p. ; 21.5–22 cm.
MIP: pp. 106–107.
Contents: p. 1 at the back.
Index: p. 5 at the back.
Addenda & corrigenda: p. [1] at the back.
§ The spelling of the text is slightly adapted and the chapters are numbered. The chapter on etching is Capitolo XXI.
The 1568 text was reprinted because Cellini was famous; this book was not seen as a manual for eighteenth-century artists.
In: BL (2×); BNP; KB; NCC; *Scarpellini 1967*: XXVI (see [No. 062.27]); NSUG; NUC–1956; UBU; ULC.

062.4

Due trattati di Benvenuto Cellini scultore fiorentina, uno dell'oreficeria l'altro della scultura. - Firenze [= Torino] : per li Tartini, e Franchi, [1795]. - XXVII, 156, [2], XV, [1], 42, [1] p. ; 28 cm.
§ Reprint of: Firenze 1731 [No. 062.3].
Although the *impressum* gives 'Firenze' the book is published in Turino.
NOT SEEN
In: *Brinckmann 1867*: 39 (see [No. 062.14]); NUC–1956; NUC–1956, Supplement.

062.5

Le opere / di Benvenuto Cellini ; con note di Gio. Palamede Carpani. - Milano : Società tipografia de' classici italiana, 1806–1811. - 3 vol. : ill. ; 21–22 cm. - (Collezione de'classici italiani ; 142–144).
§ Contains according to CLIO, p. 1030: 'Dell' oreficeria e della scultura coll' aggiunta di altre operette del medesimo Vita scritta da lui medesimo.'
– Vol. 1: Vita di Benvenuto Cellini ... / da lui medesimo scritta ; ora per la prima volta ridotta a buona lezione ed accompagnata con note da Gio. Palamede Carpani. - Milano : Società tipografia de' classici italiani, 1806. - XXVIII, 465 p.
– Vol. 2: Vita di Benvenuto Cellini ... / da lui medesimo scritta ; ora per la prima volta ridotta a buona lezione ed accompagnata con note da Gio. Palamede Carpani. - Milano : Società tipografia de' classici italiani, 1811. - XLVI, 502 p. : front.
– Vol. 3: Due trattati ... uno dell'oreficeria ... l'altro della scultura. Con aggiunta ... di altre operette de medesimo / con una prefazione da Antonio Cocchi. - Milano : Società tipografia de' classici italiani, 1811. - LX, 417 p. : front., portrait ; 8º
§ According to *Brinckmann* published after the edition: Firenze 1731.
NOT SEEN
In: BL (3×); BNP; BNM; *Brinckmann 1867*: 39 (see [No. 062.14]); BSB; CLIO: 1030 (3×); *Maier 1968*: 37 (see [No. 062.29]); NUC–1956; *Scarpellini 1967*: XXVI (see [No. 062.27]); UBA; UBH; ULC.

Opere / di Benvenuto Cellini ; ed. L Choulant. - Lipsia [= Leipzig] : Presso L. Voss, 1833–1835. - 3 vol. : tav. ; 18.5 cm.
– Vol. 1–2: Vita di Benvenuto Cellini / scritta da lui medesimo ; giusta l'autografo pubblicato dal Franceso Tassi. - Lipsia : Presso L. Voss, 1833 [?]. - […] p. : 5 tav.
– Vol. 3: Trattati e discorsi. - Lipsia : Presso L. Voss, 1835. - XIV, 176 p. : 1 tav.
§ Contains according to NUC–1956: 'Trattato dell'oreficeria. Trattato della scultura. Frammento di uno discorso sopra i principe e il modo d'imparare l'arte del disegno. Discorso dell'architettura. Sopra il suggello dell'accademia de'pittori in Firenze.'
NOT SEEN
In: BL; GV; NUC–1956.

Oeuvres complètes / de Benvenuto Cellini ; traduites par Léopold Leclanché. - [1st ed.]. - Paris : Garnier, [c. 1840?]. - 478 p. ; 19 cm.
§ Estimated date.
For the 2nd edition see: Paris 1847 [No. 062.11].
NOT SEEN
In: KVK.

Le opere : arricchite di note e illustrazioni, volume unico / di Benvenuto Cellini ; prefazione di Francesco Tassi. - Firenze : Società Editrice Fiorentina, 1843. - 600 p. : ill. ; 26.5 cm. - (Collezione generale dei classici italiani).
Due trattati: p. 427.
MIP: pp. 488.
Contents: p. 587.
§ According to *Brinckmann* published after the edition: Firenze 1731 [No. 062.3].
P. 7: 'Nel 1829 il Tipografo Guglielmo Piatti ... volle condurre una Vita di Benvenuto Cellini', this is a reprint including the *Due trattati*.
P. 428: 'Per la ristampa di questi trattati abbiamo scrupolosamente seguita le edizione dei Classici di Milano sopravveduta dall'eruditissimo Carpani, che arricchi di sue note la bella Prefazione della edizione citata dalla Crusca del 1731, sopra la quale egli condusse la sua.'
Printer: Tipografia di Felice le Monnier.
In: BL; BNP; *Brinckmann 1867*: 39 (see [No. 062.14]); GV; *Maier 1968*: 37 (see [No. 062.29]); KSM; RMA; *Scarpellini 1967*: XXVI (see [No. 062.27]).

Traité de l'orfèvrerie / Benvenuto Cellini ; traduit de l'italien pour la première fois par Eugène Piot. - [S.l.] : [s.n.], [c. 1845?]. - 77 p. : ill. ; […] cm.
§ Estimated date.
NOT SEEN
In: KVK; NUC–1956.

Oeuvres complètes / de Benvenuto Cellini ; traduites par Léopold Leclanché. - Nouvelle éd. - Paris : Garnier, 1846. - 2 vol. ; 19 cm.
NOT SEEN
In: NUC–1956; UBH.

Oeuvres complètes / de Benvenuto Cellini ; traduites par Léopold Leclanché. - Deuxiéme éd. - Paris : Paulin, 1847. - 2 vol. ; 12º
– Vol. 1: Mémoires.
– Vol. 2: Suite de Mémoires. Traités de l'orfèvrerie et de la sculpture. Discours sur le dessin et l'architecture.
For the first edition see: Paris 1840 [No. 062.7].
NOT SEEN
In: BNP; *Brinckmann 1867*: 39 (see [No. 062.14]); *Fröhlich & Fröhlich 1974* (see [No. 062.32]); NUC–1956.

Due trattati, uno intorno alle otto principali arti dell'oreficeria, l'altro dell'arte della scultura, dove si ragiona del lavorare le figure di marmo e gettarle in bronzo / composti da Benvenuto Cellini. - Milano : Giovanni Silvestri, 1852. - VI, [2], 302, [2] p. ; 17–18 cm. - (Biblioteca scelta di opere italiane ; 564).
Manuele diepdruk: pp. 186–187.
Contents: pp. 191, 287.
Index: p. 289.
Stocklist: p. [1] at the back.
§ Both parts have their own contents.
Published after the edition: Firenze 1731 [No. 062.3].
In: BNP; NCC; NUC–1956 Supplement; *Scarpellini 1967*: XXVI (see [No. 062.27]); UBU.

I trattati dell'oreficeria e della scultura di Benvenuto Cellini : novamente messi alle stampe secondo la originale dettatura del codice Marciano. Si aggiungono: i discorsi e i ricordi intorno all'arte. Le lettere e le suppliche. Le poesie / per cura di Carlo Milanesi. - Firenze : Le Monnier, 1857. - LVIII, 487 p. : [1] folded genealogical table ; 18–19 cm.
MIP: pp. 155–156.
Person index: p. 415.
Glossary: p. 121.
Contents: p. 485.
§ The first unedited publication of Cellini's original manuscript, see: Firenze 1565–1567 [No. 062.1].
The genealogical table is bound between pp. LVIII and 1.
In: BL; BNM; *Brinckmann 1867*: 39 (see [No. 062.14]); CLIO: 1031; *Maier 1968*: 37 (see [No. 062.29]); NSUG; NUC–1956; *Scarpellini 1967*: XXVI (see [No. 062.27]); UBAB; UBH.

Abhandlungen über die Goldschmiedekunst und die Sculptur von Benvenuto Cellini / übersetzt und verglichen mit den Parallelstellen aus Theophilus 'Diversarum artium schedula' von Justus Brinckmann. - Leipzig : Seemann, 1867. - VI, 193 p. : front., 5 Fig. ; 8º.
Contents: p. V.

Bibliography of the *Due trattati*: p. 39.
MIP: pp. 127–128.
List of artists in the *Due trattati*: p. 191.
With literature.
§ Title description after: Osnabrück 1978 [No. 062.33].
NOT SEEN
In: BL (Missing); GV; KSM.

062.15

I trattati dell'oreficeria e della scultura / Benvenuto Cellini ; novamente messi alle stampe secondo la originale dettatura del codice marciano per cura di Carlo Milanesi ; si aggiungono: i discorsi e i ricordi intorno all'arte, le lettere e le suppliche, le poesie. - Firenze : Successori Le Monnier, 1893. - LVIII, 487 p. : [1] folded tab. ; 18 cm.
§ Publication after the original manuscript: Firenze 1565–1567 [No. 062.1].
With a genealogical table.
NOT SEEN
In: KVK; NUC–1956.

062.16

The treatises of Benvenuto Cellini on goldsmithing and sculpture / [introd. and transl. by C.R. Ashbee] ; [etch. by 'Le Rat']. - London : Guild and school of handicraft ; Arnold, 1898. - XIV, [2], 164, [4] p. : [18] ill. ; 30.5 cm.
MIP: pp. 105.
Glossary and index: p. 147.
Addenda & corrigenda: p. [3] at the back.
Stocklist: p. [4] at the back.
With literature
Edition: 600 copies.
§ P. [3]: 'Made into English from the Italian of the Marcian Codex by C.R. Ashbee.' It is not clear whether the author translated directly after the original manuscript (Firenze 1565–1567 [No. 062.1]) or after a publication of the text of the manuscript.
Le Rat is a pseudonym.
Date of printing, p. [3]: '[Printing] begun April, 1898; finished October, 1898'.
The illustrations are seven line blocks for the diagrams in the text, six reproductions in etching by Le Rat and four reproductions in photogravure.
Photomechanical reprint: New York 1967 [No. 062.27].
In: BL; NCC; NUC–1956; RMA; UBU; ULC.

062.17

La vita di Benvenuto Cellini : seguìta dai trattati dell'oreficeria e della scultura e dagli scritti sull'arte / prefazione e note di Arturo Jahn Rusconi e A[ntonio] Valeri. - Roma : Società Editrice Nazionale, 1901. - XXIV, 857 p. : 196 reprod. ; 24.5 cm.
Due trattati: pp. 643–789.
MIP: p. 749.
Index: p. 829.
List of illustrations: p. 841.
Contents: p. 846.
§ Publication after the original manuscript: Firenze 1565–1567 [No. 062.1].
In: BL; *Maier 1968*: 37 (see [No. 062.29]); NCC; UBU.

062.18

Scritti scelti a illustrazione della sua vita e della sua arte / Benvenuto Cellini ; a cura di Giulio Urbini. - Milano : Vallardi, 1923. - LXIX, 348 p. : ill. ; 21 cm. - (Biblioteca di classici italiani annotati).
NOT SEEN
In: KVK; *Scarpellini 1967*: XXVI (see [No. 062.27]).

062.19

Oeuvres complètes / de Benvenuto Cellini ; traduites par Léopold Leclanché. - Deuxiéme éd. - Paris : Ed. Garnières Frères, 1908. - 2 vol.
– Vol. 1: Mémoires.
– Vol. 2: Suite de Mémoires. Traités de l'orfèvrerie et de la sculpture. Discours sur le dessin et l'architecture.
NOT SEEN
In: KVK; *Fröhlich & Föhlich 1974* (see [No. 062.32]).

062.20

I trattati dell'oreficeria e della scultura, secondo il Codice Marciano / Benvenuto Cellini ; a cura di L. de Mauri ; ed. Sarasìno. - Firenze : Hoepli, 1927. - XXIV, 289 p. : XX pl. ; 19.5 cm.
§ *Scarpellini*: 'è l'edizione più attendibile, riscontrata sul Codice Marciano'.
The editor is 'Serasino', according to *Maier 1968*: 38.
NOT SEEN
In: *Maier 1968*: 37 (see [No. 062.29]); NUC–1956; *Scarpellini 1967*: XXVI (see [No. 062.27]).

062.21

Tratados de la orfebrería y de la escultura : con dos apéndices sobre los 'Discursos' del dibujo y de la arquitectura / por Benvenuto Cellini. - México : Leyenda, [1930–1940?]. - 154 p. ; 20 cm.
NOT SEEN
In: KVK.

062.22

Tratados de la orfebrería y de la escultura : con dos apéndices sobre los 'Discursos' del dibujo y de la arquitectura / por Benvenuto Cellini. - México : Leyenda, [1940–1950?]. - 154 p. ; 20 cm. - (Atalaya ; 7).
NOT SEEN
In: KVK.

Tratados de la orfebrería y la escultura : seguidos de los discursos sobre el arte / Benvenuto Cellini. - Buenos Aires : Schapire, 1949. - 214 p. : ill. ; […] cm.
NOT SEEN
In: KVK.

Tratados de la orfebrería y de la escultura : con dos apéndices sobre los "discursos" del dibujo y de la arquitectura / por Benvenuto Cellini. - México : Leyenda, [1950–1960?]. - 154 p. ; 20 cm.
NOT SEEN
In: KVK.

Le opere / Benvenuto Cellini ; a cura di G. Cattaneo. - Milano : […], 1958. - […] p. : 69 ill. […] cm.
§ Unclear what this is, not in KVK. *Maier*, p. 37, gives as the title: '*La vita* con l'aggiunta di: *Trattato dell'oreficeria*, *Trattato della scultura*, *Discorsi sopra l'arte*, *Lettere e suppliche*, *Poesie*', with the reference: 'cfr. B. Maier, in "La Rass. della lett. ital.", LXIII, 1959, pagg. 452–55'.
NOT SEEN
In: *Maier 1968*: 37 (see [No. 062.29]); *Scarpellini 1967*: XXVI (see [No. 062.27]).

Opere di Baldassarre Castiglione, Giovanni della Casa, Benvenuto Cellini / a cura di Carlo Cordié. - Milano ; Napoli : Ricciardi, 1960. - LXXX, 1164 p. ; 23 cm. - (La Letteratura italiana. Storia e testi ; 27).
Contents: p. V (general), p. 1161 (detailed).
Bibliography of Cellini: p. LV.
Due trattati: pp. 971–1107; comments: pp. 1125–1132.
MIP: pp. 1068–1069.
Index: p. 1135
§ *Scarpellini*: 'Un'accurata edizione critica, che ha detto una parola definitiva sul Cellini.'
In: HAB; *Maier 1968*: 37 (see [No. 062.29]); *Scarpellini 1967*: XXVI (see [No. 062.27]).

The treatises of Benvenuto Cellini on goldsmithing and sculpture / transl. from the Italian by C.R. Ashbee / [ill. by Le Rat]. - [Photom. repr.]. - New York : Dover, first published 1967. - XIV, [2], 164, [17] p. : 25 ill. ; 23.5–24 cm.
Contents: p. V.
List of illustrations: p. VIII.
MIP: p. 105.
Glossary: p. 147.
Addenda & corrigenda: p. [3].
Stocklist: inside frontcover, p. [7], inside backcover.
ISBN 0-486-21568-7 (softcover)
§ The coins reproduced on one page between pp. 68 and 69 in the original editions are divided over four pages in the present reprint. The breviary cover reproduced on one page between pp. 32 and 33 in the original edition is divided over two pages in the present reprint. The jewels reproduced on two pages between pp. 22 and 23 and pp. 24 and 25 in the original edition are spread over two pages each in the present reprint.
Typically for Dover publications there are several issues, all 'first published 1967', but without and with ISBNs, with different covers and the contents of the stocklists differ per issue.
Photomechanical reprint of: London 1898 [No. 062.16].
In: KB; NUC 1956–1967; RCE; RMA; UBG; UBU; ULC (2×).

Benvenuto Cellini : la vita, i trattati, i discorsi / introduzione e note di Pietro Scarpellini. - Roma : Casini, 1967. - XXX, 580 p. : [33] reprod. ; 20–21 cm. - (I grandi secoli).
Contents: p. V.
Bibliography Cellini: p. XXVII.
Due trattati: pp. 411–560.
MIP: pp. 520–521.
With literature.
§ Publication after the original manuscript: Firenze 1565–1567 [No. 062.1]. Without the titles of the chapters.
In: *Maier 1968*: 37 (see [No. 062.29]); NCC; NUC 1968–1972; RMA; UBH; UBU.

Benvenuto Cellini, opere : vita, trattati, rime, lettere / a cura di Bruno Maier. - Milano : Rizzoli, 1968. - 1024 p. : 5 tav. ; 19–19.5 cm. - (I classici Rizzoli).
Bibliography Cellini: p. 37.
Due trattati: pp. 619–868.
MIP: pp. 787–788.
List of illustrations: p. 1019.
Contents: p. 1021.
§ Publication after the original manuscript text: Firenze 1565–1567 [No. 062.1].
The *Tavole* are reproductions.
In: NCC; NUC 1968–1972; RMA; UBH; UBU; ULC.

Benvenuto Cellini, Abhandlungen über die Goldschmiedekunst und die Bildhauerei / übersetzt von Ruth [Fröhlich] und Max Fröhlich ; technische Bearbeitung und Zeichnungen von Max Frölich ; Vorwort des Herausgebers Gustav Kyburz. - Basel : Gewerbemueum, [c. 1970]. - 143 p. : ill., partly in colour ; 4º.
NOT SEEN
In: HAB.

Opere / Benvenuto Cellini ; a cura di Giuseppe Guido Ferrero ; con un profilo della Vita celliniana di Enrico Carrara. - Torino : Unione Tipografico-Editrice Torinese, 1971. - 1022 p. : [ill.?] ; 24 cm. - (Classici italiani).
NOT SEEN
In: BL; ULC.

Benvenuto Cellini : Abhandlungen über die Goldschmiedekunst und die Bildhauerei / übersetzt von Ruth [Fröhlich] und Max Fröhlich ; technische Bearbeitung und Zeichnungen von Max Fröhlich ; redaktionele Mitarbeit Alex Cizinsky ; Vorwort des Herausgebers Gustav Kyburz. - Basel : Gewerbemuseum, 1974. - 144 p. : [72] ill., of which [2] in colour ; 21.5 × 24 cm.
Contents: p. 4.
Translation of the *Due Trattati*: pp. 11–123.
MIP: pp. 96–97, noten op p. 138.
Notes: pp. 133–138.
Glossary: p. 139.
Measures, weights and currencies: p. 143.
Literature: p. 143.
§ Annotated German translation of the original manuscript text: Firenze 1565–1567 [No. 062.1].
In: HAB; UBH; UBU; UBL.

Abhandlungen über die Goldschmiedekunst und die Sculptur / von Benvenuto Cellini ; übersetzt und verglichen mit den Parallelstellen aus Theophilus' Diversarum artium schedula von Justus Brinckmann. - [Photom. repr.]. - Osnabrück : Illmer, 1978. - VI, 193 p. : front., 5 Fig. ; 21.5 cm.
Contents: p. V.
Bibliography of the *Due trattati*: p. 39.
MIP: pp. 127–128.
List of artists in the *Due trattati*: pp. 191–193.
With literature.
§ The *Figuren* are reproductions.
Photomechanical reprint of: Leipzig 1867 [No. 062.14].
In: NCC; UBU.

Due trattati : uno intorno alle otto principali arti dell' oreficeria, l'altro in materia dell'arte della scultura ... [etc.] / Benvenuto Cellini ; introd. di Antonio Altomonte. - Modena : Aldini, 1983. - 23, (145) p.
§ Photomechanical reprint of: Fiorenza 1568 [No. 062.2].
NOT SEEN
In: RMA; UBA; UBH.

Tratados de orfebrería, escultura, dibujo y arquitectura / Benvenuto Cellini ; prólogo, Fernando Checa Cremades ; traducción, Juan Calatrava Escobar. - Reissue. - Torrejon de Ardoz ; Madrid : Akal, 1989. - 223 p. ; 18 cm. - (Fuentes de Arte ; 8).
MIP: pp. 146–147.
ISBN 84-7600-392-7
NOT SEEN
In: BNM; KVK.

I trattati dell' oreficeria e della scultura / di Benvenuto Cellini ; novamente messi alle stampe secondo la originale dettatura del codice Marciano per cura di Carlo Milanesi. - [Photom. repr.]. - Firenze : Paoletti, 1994. - XIV, LVIII, 487 p. ; 18 cm.
ISBN 88-00-70004-7
NOT SEEN
In: KVK.

Traktate über die Goldschmiedekunst und die Bildhauerei = I trattati dell'oreficeria e della scultura / di Benvenuto Cellini; auf der Grundlage der Übersetzung von Ruth und Max Fröhlich als Werkstattbuch kommentiert und herausgegeben von Erhard Brepohl. - Köln ; Weimar ; Wien : Böhlau, 2005. - 208, [3] p. : front., 22–12, IV Bilder, XVI Taf. ; 28 cm.
Contents: p. 5.
MIP: pp. 160–161.
Literature: p. 205.
Index: p. 207.
Advertisement: p. [3].
ISBN 3-412-24705-7 (softcover)
§ Based on the text of the manuscript in *Fröhlich & Fröhlich 1974* [No. 062.32].
In: RCE.

The Thames and Hudson manual of etching and engraving / Walter Chamberlain ; [diagrams by Susan Chamberlain] ; [b/w photogr. by John Warwick] ; [colour photogr. on the jacket by John Edler. - [1st ed.]. - London : Thames and Hudson, cop. 1972. - 200 p. : 103 ill. in b/w, 8 ill. in colour ; 24.5 cm. - (The Thames and Hudson Manuals).
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Glossary: p. 185.
Suppliers and plate printers: p. 195.
Index: p. 198.

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§ The illustrations are diagrams, photographs and reproductions.

The diagrams of two burins on p. 116 are copied in **Lehtinen** (Helsinki 1992) [No. 185]: 20.

The different editions have differently coloured covers, while texts and contents are identical.

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5 –

Art History

In: *Blas Benito 1994*: 76; BL; BLBS; BNB50; BNM; CCB; CCB 2/2; DBI-VK; *Figueras Ferrer 1992*: 1037; GDH; KVB; NCC; OBA; OCLC (61×); Priv.Coll.; RAA; RAL; SBB; SBH; UBA; UBU.

063.2

Etching and engraving / Walter Chamberlain ; [diagrams by Susan Chamberlain] ; [b/w photogr. by John Warwick] ; [colour photogr. on the jacket by John Edler]. - New York : The Viking Press, cop. 1972. - 200 p. : 104 ill. in b/w, 8 ill. in colour ; 25 cm. - (A Studio Book).

Contents: p. 5.

Literature: p. 182.

Glossary: p. 185.

Suppliers and plate printers: p. 195.

Index: p. 198.

Stocklist: inside backflap.

SBN 670-29827-1 (hardcover)

§ Date of publishing: 'Published in 1973'.

In: OCLC (87×); Priv.Coll.

063.3

The Thames and Hudson manual of etching and engraving / Walter Chamberlain ; [diagrams by Susan Chamberlain] ; [b/w photogr. by John Warwick] ; [colour photogr. on the jacket by John Edler]. - [2nd repr.]. - London : Thames and Hudson, 1977. - 200 p. : 103 ill. in b/w, 8 ill. in colour ; 24 cm. - (The Thames and Hudson Manuals).

Contents: p. 5.

Literature: p. 182.

Glossary: p. 185.

Suppliers and plate printers: p. 195.

Index: p. 198.

Stocklist: backside cover.

ISBN 0-500-68001-9 (softcover)

In: CCB 2/2; DBI-VK; NCC; KABK; MMW; MBKL; OBA; OBDH; OCLC (12×); Priv.Coll.; RAA; ULC.

063.4

The Thames and Hudson manual of etching and engraving / Walter Chamberlain ; [diagrams by Susan Chamberlain] ; [b/w photogr. by John Warwick] ; [colour photogr. on the jacket by John Edler]. - [3rd repr.]. - London : Thames and Hudson, 1981. - 200 p. : 103 ill. in b/w, 8 ill. in colour ; 24 cm. - (The Thames and Hudson Manuals).

Contents: p. 5.

Literature: p. 182.

Glossary: p. 185.

Suppliers and plate printers: p. 195.

Index: p. 198.

Stocklist: backside cover.

ISBN 0-500-68001-9 (softcover)

In: DBI-VK; Priv.Coll.

063.5

The Thames and Hudson manual of etching and engraving / Walter Chamberlain ; [diagrams by Susan Chamberlain] ; [b/w photogr. by John Warwick] ; [colour photogr. on the jacket by John Edler]. - [4th repr.]. - London : Thames and Hudson, 1984. - 200 p. : 103 ill. in b/w, 8 ill. in colour ; 24 cm. - (The Thames and Hudson Manuals).

Contents: p. 5.

Literature: p. 182.

Glossary: p. 185.

Suppliers and plate printers: p. 195.

Index: p. 198.

Stocklist: backside cover.

ISBN 0-500-68001-9 (softcover)

In: Priv.Coll.

063.6

The Thames and Hudson manual of etching and engraving / Walter Chamberlain ; [diagrams by Susan Chamberlain] ; [b/w photogr. by John Warwick] ; [colour photogr. on the jacket by John Edler]. - [5th repr.]. - London : Thames and Hudson, 1992. - 200 p. : 103 ill. in b/w, 8 ill. in colour ; 24 cm. - (The Thames and Hudson Manuals).

Contents: p. 5.
Literature: p. 182.
Glossary: p. 185.
Suppliers: p. 195.
Plate printers: p. 197.
Index: p. 198.
Stocklist: backside cover.
ISBN 0-500-68001-9 (softcover)
§ The cover is redesigned.
The list of suppliers is revised.
In: BIP+; DBSM; Priv.Coll.

063.7

Manual de aguafuerte y grabado / Walter Chamberlain ; traducción Alfredo Cruz Herce ; [diagrams by Susan Chamberlain] ; [b/w photogr. by John Warwick] ; [colour photogr. on the jacket by John Edler]. - [Ed. en castellano]. - Madrid : Herman Blume, 1988. - 200 p. : 103 ill. in b/w, 8 ill. in colour ; 24 cm.
§ Translation of the edition: London 1972.
NOT SEEN
In: *Blas Benito 1994*: 76; *Figueras Ferrer 1992*: 1037.

063.8

Manual de aguafuerte y grabado / Walter Chamberlain ; traducción Alfredo Cruz Herce ; [diagrams by Susan Chamberlain] ; [b/w photogr. by John Warwick] ; [colour photogr. on the jacket by John Edler]. - [Ed. en castellano, 1st repr.]. - Madrid : Tursen, Herman Blume, 1995. - 200 p. : 103 ill. in b/w, 8 ill. in colour ; 24 cm.
Contents: p. 5.
Literature: p. 182.
Glossary: p. 185.
Suppliers and plate printers: p. 195.
Index: p. 198.
Stocklist: backside softcover.
ISBN 84-87756-58-1 (hardcover)
ISBN 84-87756-59-X (softcover)
§ The suppliers are the same as in the English original, no Spanish suppliers are mentioned.
Design and contents are the same as in the original, even the cover looks almost the same.
In: BNM; Priv.Coll.

Chapman (John Gadsby)   064.1

The American drawing-book: a manual for the amateur, and basis of study for the professional artist: especially adapted to the use of public and private schools, as well as home instruction / by J[ohn] G[adsby] Chapman. - New York : J.S. Redfield, 1847. - 168 p. ; ill., diagr. ; 28–30 cm.
§ Cover title: Chapman's American drawing-book
Without information on printmaking techniques yet in this edition.
Title description after microfilm.
4 –
Calligraphy / Drawing / Geometry
In: OCLC.

064.2

The American drawing-book: a manual for the amateur, and basis of study for the professional artist: especially adapted to the use of public and private schools, as well as home instruction / by J[ohn] G[adsby] Chapman. - New York : J.S. Redfield ; Boston : B.B. Mussey & Co. ; Cincinnati : J.A. & U.P. James, 1847–1858. - 4 pts. (304 p.) : ill. ; 30 cm.
§ Instructions on printmaking are probably added to this issue because the increased number of pages (304) are consistent throughout all later editions.
NOT SEEN
In: LC; NUC–1956; OCLC.

064.3

The American drawing book : a manual for the amateur, and basis of study for the professional artist : especially adapted to the use of public and private schools, as well as home instruction / by J[ohn] G[adsby] Chapman. - New York : J.S. Redfield, 1858. - VIII, 304 p. : ill. ; 29 cm.
§ NUC: 'Introduction and chapters 1–4 published in London, under title: The elements of art.'
Hubbard 1 (London, 1920) [No. 153] 147: 'Well illustrated chapter on etching and aquatint.'
NOT SEEN
In: NUC–1956; OCLC.

064.4

The American drawing book : a manual for the amateur, and basis of study for the professional artist : especially adapted to the use of public and private schools, as well as home instruction / by J[ohn] G[adsby] Chapman. - New York : S.A. Rollo, 1859. - VIII, 304 p. : ill. ; 28–29 cm.
§ OCLC: 'introduction and chapters 1–4 (later) published in London, under title: The elements of art.'
NOT SEEN
In: OCLC.

064.5

The American drawing-book : a manual for the amateur, and basis of study for the professional artist : especially adapted to the use of public and private schools, as well as home instruction / by J[ohn] G[adsby] Chapman. - New York : W.J. Widdleton, 1864. - viii, 304 p. : ill. ; 31 cm.
NOT SEEN
In: LC; NUC–1956.

The American drawing book: a manual for the amateur, and basis of study for the professional artist: especially adapted to the use of public and private schools, as well as home instruction / by J[ohn] G[adsby] Chapman. - A new ed. / carefully rev. and corr. by the author. - New York : A.S. Barnes, 1870. - viii, 304 p. : [297] ill. ; 29 cm.

Contents: p. iii.
MIP: pp. 253–278 : [44] ill.
Suppliers: p. 267.
With literature.
§ NUC: 'Introduction and chapters 1–4 published in London, under title: The elements of art.'
The illustrations are diagrams and reproductions.
Title description after microfilm.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Glass / Steel / Stone
4 –
Calligraphy / Drawing / Lithography / Painting / Photography / Sculpture / Wood Engraving
In: LC; OCLC.

The American drawing book ... [etc.]. - New ed. / carefully rev. and corr. by the author ... [etc.]. - New York : A.S. Barnes, 1873. - viii, 304 p. : ill. ; 29 cm.
NOT SEEN
In: NUC–1956.

The American drawing book ... [etc.]. - A new ed. - New York : A.S. Barnes, 1877. - viii, 304 p. : ill. ; 31 cm.
NOT SEEN
In: OCLC.

Chattock (Richard Samuel)

Practical notes on etching / by Rich[ard] S[amuel] Chattock. - [1st ed.]. - London : Sampson Low, Martson, Searle, & Rivington [?], 1882. - V, 74 p. : ill., 8 pl. ; 23 cm.
§ Originally published as a series of articles, see: **Chattock** (1880–1882) [No. 412].
Largely the same as the text in the articles, a few paragraphs are added, with some minor changes and with additional plates. The author discusses particular techniques by referring to the plates.
Bridson & Wakeman: 'The pls. comprise 7 etch. and a drypt. They incl. demonstrations of 2 etch. in 2 states, and an etch. printed clean-wiped and with retroussage. Good descriptions of methods of working the desing on the plate, of auxiliary processes such as dry-point, re-biting and re-etching.'
Announcement: *The Etcher*, 4 (1882): 18.
Review: *The Art-Journal*, new series (1883): 240.
NOT SEEN
In: *Bridson & Wakeman 1984*: nos. B27, B31; OCLC (10×).

Practical notes on etching / by Rich[ard] S[amuel] Chattock. - [2nd ed.]. - New York : Scribner and Welford, 1883. - V [?], 74 p. : ill., 8 leaves of pl. ; 23 cm.
NOT SEEN
In: BAI-1901, vol. 61: 256; *Levis 1912*: 107; NUC–1956; OCLC (8×).

Practical notes on etching / by Rich[ard] S[amuel] Chattock. - [2nd ed.]. - London : Sampson Low, Martson, Searle, & Rivington, 1883. - 74 p. : ill., 8 pl. ; 23 cm.
NOT SEEN
In: BL; BLBS; *Levis 1912*: 107; NUC–1956; OCLC (3×); ULC.

Practical notes on etching / by R[ichard] S[amuel] Chattock ; [etch. by Richard Samuel Chattock]. - Third ed., rev. - London : Sampson Low, Marston, Searle, & Rivington, 1886. - [6], 74 p. : 8 fig., 8 etch.; 23 cm.
Contents: p. [3].
List of illustrations: p. [5].
Index: p. 73.
With literature.
§ One etching is a frontispiece. The 'figures' are diagrams.
1 –
Drypoint / Electrolytic Etching / Line Etching
2 –
Copper / Steelfacing / Zinc
3 –
Ink / Paper / Press / Printing in Black
In: *Levis 1912*: 107; NUC–1956; OCLC (4×); Priv.Coll. (2×).

Clarke (Hewson)
See: **Hodson 2** (Thomas) [No. 147.2].

Clarke (Richard)
See: **Hartill** (Brenda) & **Clarke** (Richard) [No. 134].

Clerc (Sébastien le)
See: **Bosse** (Paris 1701) 1st issue [No. 042.6].
See: **Bosse** (Paris 1701) 2nd issue [No. 042.7].
See: **Le Comte** (Florent) [No. 181].

Cochin fils (Charles-Nicolas)
See: **Bosse** (Paris 1745) [No. 042.8].
See: **Bosse** (Paris 1758) [No. 042.11].

Coker (Peter)   066.1

Etching techniques / Peter Coker. - London : Batsford, 1976. - 95 p. : front., [103] ill. ; 25.5 cm.
Contents: p. 5
Appendix: p. 90.
Suppliers: p. 94.
ISBN 0-7134-3063-X (hardcover)
§ The illustrations are diagrams, photographs, reproductions and tables.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Zinc
3 –
Ink / Press / Printing in Black
5 –
Conservation and Restoration
In: BL; BNB50; DBI-VK; KABK; GBR; NCC; OBDH; OCLC (18×); Priv.Coll. (3×); RAA; RAL; UBA; ULC.

066.2

Etstechnieken / Peter Coker ; vertaling Hans Walenkamp. - [1st ed.]. - De Bilt : Cantecleer ; Schoten, B[elgium] : Westland, cop. 1979. - 93, [2] p. : front., 103 [1] ill. ; 21 cm. - (Werken en spelen).
Contents: p. 5.
Suppliers: p. 93.
Stocklist: p. [1] at the back.
ISBN 90-213-1363-4 (softcover)
§ Title means: Etching techniques
Translation of the edition: London 1976.
The suppliers are all Dutch firms.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Zinc
3 –
Ink / Press / Printing in Black
5 –
Conservation and Restoration
In: GBR; KB; MMW; NCC (20×); OBA; OBDH; RAA; SPKA.

066.3

Etstechnieken / Peter Coker ; vertaling Hans Walenkamp. - [1st repr.]. - De Bilt : Cantecleer ; Schoten, B[elgium] : Westland, 1981. - 93, [2] p. : front., 103 [1] ill. ; 21 cm. - (Werken en spelen).
Contents: p. 5.
Suppliers: p. 93.
Stocklist: p. [1] at the back.
ISBN 90-213-1363-4 (softcover)
In: KB; OBU; Priv.Coll.

Compendium   067

A compendium of colors, and other materials used in the arts dependant on design, with remarks on their nature and uses: including the method of drawing in chalk, crayons, &c. of painting in water colors, crayons, &c. of engraving in strokes, chalks, mezzotinto, aquatinta, &c. of modelling, and of sculpture, &c. &c. - [Ed. 7]. - [London] : [Charles Taylor], [1797]. - 224 p. : [2] front., [17] pl. ; 22–24 cm.
Glossary: p. 7.
MIP: pp. 9–10, 50–52, 177–202.
With literature.
§ The bibliography of this publication is unclear, as the contents and collations of the copies consulted are different; hence the copy of the National Gallery, London, is described. The text seems to be part of: The artist's repository and drawing magazine, exhibiting the principles of the polite arts in their varous branches / [by Francis FitzGerald]. - London : Charles Taylor, 1788–1794. - 5 vol. At the bottom of p. 81 it says: 'vol. 2 edit 7 Introductory beginning of gather L'. This might mean volume two of the seventh edition.
Items on engraving and etching in the glossary (pp. 51–52) largely after **Dossie** (London 1758) [No. 080.1] 2: 56–57, 84, or from a later edition.
Similarly, the part on mezzotint (pp. 190–192) is summarised and quoted after **Dossie** (London 1758) [No. 080] 2: 173–182.
1 –

Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Stipple Engraving
2 –
Copper / Glass
3 –
Hand-colouring / Multiple-plate Printing / Print behind Glass / Printing à la Poupée / Printing Polychrome
4 –
Woodcut
5 –
Aesthetics / Art History / Health and Safety
In: BL; *Carlyle 2001*: 294–295; ESTC: no. n032339; NG; NUC–1956 (3×); OCLC.

Complete aquatinter
See: **Green** (J.H.) [No. 128].

Comte (Florent le)
See: **Le Comte** (Florent) [No. 181].

Cox (Alan)
See: **Russ** (Stephen) [No. 279].

Critical and familiar notices
See: **Huband** (Wilcocks) [No. 152].

Cröker (Johann Melchior) 068.1
Der zur Oel-Farben-Mahlerey und zu vielen anderen curieusen Wissenschaften wol anführende Maler ... [etc.] / J[ohann] M[elchior] C[röker]. - [1st ed.]. - Frankfurt [am Main]; Leipzig : [Cröker?], 1719. - 2 vol. (536 p.) : front., ill.
§ Title means: The painter introducing painting in oils and many other curious sciences (etc.)
Perhaps the book was published in Jena because all other editions were published there.
According to *Schießl 1982* [No. 068.9]: VI, instructions for intaglio printmaking were added only in the second edition (Jena 1729).
NOT SEEN
In: BS; DBI-VK; *Schießl 1982* [No. 068.9]: XVII, no. 1; *Schießl 1989*: no. 470.

068.2
Der wohl anführende Mahler, welcher curiöse Liebhaber lehret, wie man sich zur Mahlerey zubereiten, mit Oel-Farben umgehen, Gründe, Fürnisse und andere darzu nöthige Sachen verfertigen, die Gemählde geschickt auszieren, vergölden, versilbern, accurat lacquiren, und saubere Kupfferstiche ausarbeiten solle. Diesem ist noch beygefüget ein Kunst-Cabinet, rarer und geheim-gehaltener Erfindungen / Alles aus eigener Erfahrung aufgezeichnet von Johann Melchior Crökern. - Neue [2nd] viel vermehrte und verbesserte Aufl. - Jena : bey Johann Rudolph Crökern, 1729. - [14], 544 p. : front., [69] woodcuts; 17–18 cm.
Contents: p. [7] at the beginning.
MIP: pp. 269–294, 400–405 : [12] woodcuts.
With literature.
§ Several new subjects are added to this edition, such as on engraving, mezzotint and etching in chapter five; see p. [5].
The preface is dated: 'Jena 1729. den 2. May, der Verleger'.
The frontispiece is an etching, all illustrations are woodcuts inserted in the text. The woodcutter might be Heinrich Christoph Cröker; *Schießl 1982* [No. 068.9]: VI.
1 –
Échoppe / Line Engraving / Line Etching / Mezzotint / Relief Etching
2 –
Bone / Brass / Copper / Iron / Ivory / Steel
3 –
Casting / Print behind Glass
4 –
Drawing / Painting / Woodcut
In: BS; NSUG; OCLC; DBI-VK; *Schießl 1982* [No. 068.9]: no. 2; *Schießl 1989*: no. 473; UBH.

068.3
Der wohl anführende Mahler, welcher curiöse Liebhaber lehret, wie man sich zur Mahlerey zubereiten, mit Oel-Farben umgehen, Gründe, Fürnisse und andere darzu nöthige Sachen verfertigen, die Gemählde geschickt auszieren, vergülden, versilbern, accurat lacquiren, und saubere Kupffer-Stiche ausarbeiten solle. Diesem ist noch beygefüget ein Kunst-Cabinet rarer und geheim gehaltener Erfindungen / alles aus eigener Erfahrung aufgezeichnet von Johann Melchior Crökern ; [front. Hoffmann delin., Krügner sc.]. - Neue [3rd] vielvermehrte und verbesserte Aufl. - Jena : bey Johann Rudolph Crökern, 1736. - [14], 536, [8] p. : front., [77] woodcuts ; 8º.
Contents: p. [8] at the beginning.
MIP: pp. 273–296, 394–396 : [14] woodcuts.
With literature.
Index: p. [1] at the back.
§ The preface is dated, p. [7]: 'Jena 1736, den 14. April der Verleger'.
A year later Cröker died and the subsequent editions published after his death changed little except for the final edition of 1804.
This is the first edition with an index.
Title description after: Mittenwald 1982 [No. 068.9].
NOT SEEN
In: BS; DBI-VK; *Schießl 1982* [No. 068.9]: no. 3; *Schießl 1989*: no. 474.

Der wohl anführende Mahler welcher curiöse Liebhaber lehret, wie man sich zur Mahlerey zubereiten, mit Oel-Farben umgehen, Gründe, Fürnisse und andere darzu nöthige Sachen verfertigen, die Gemählde geschickt auszieren, vergülden, versilbern, accurat lacquiren, und saubere Kupffer-Stiche ausarbeiten solle. Diesem ist noch beygefüget ein Kunst-Cabinet rarer und geheim gehaltener Erfindungen / alles aus eigener Erfahrung aufgezeichnet von Johann Melchior Crökern. - Neue [4th] vielvermehrte und verbesserte Aufl., welcher zugleich ein vollständiges Register beygefüget worden. - Jena : bey Joh[ann] Rudolph Crökers seel. Wittbe, 1743. - [14], 536, [8] p. : front., [77] woodcuts ; 18 cm.
Contents: p. [8] at the beginning
Index: p. [1] at the back.
MIP: pp. 273–296, 394–395 : [14] woodcuts.
With literature.
§ The text has been reset but the contents and illustrations are the same.
The preface is dated: 'Jena, 1743. den 24. September. Die Verlegerin.'
Photomechanical reprint: Rottenburg 1987 [No. 068.10].
Title description after photocopy and: Rottenburg 1987 [No. 068.10].
In: CCB; DBI-VK; KB; *Schießl 1982* [No. 068.9]: no. 4; *Schießl 1989*: no. 475.

Der wohl anführende Mahler welcher curiöse Liebhaber lehret wie man sich zur Mahlerey zubereiten, mit Oel-Farben umgehen, Gründe, Fürnisse und andere darzu nöthige Sachen verfertigen, die Gemählde geschickt auszieren, vergülden, versilbern, accurat lacquiren, und saubere Kupffer-Stiche ausarbeiten solle. Diesem ist noch beygefüget ein Kunst-Cabinet rarer und geheim gehaltener Erfindungen / Alles aus eigener Erfahrung aufgezeichnet von Johann Melchior Crökern. - Neue [5th] vielvermehrte und verbesserte Aufl., welcher zugleich ein vollständiges Register beygefüget worden. - Jena : bey Joh. Rudolph Crökers seel. Wittbe, 1753. - [6], [7], 536, [8] p. : front., woodcuts ; 8˚.
NOT SEEN
In: BL; BLBS; DBI-VK; NUC–1956; *Schießl 1982* [No. 068.9]: no. 5; *Schießl 1989*: no. 476.

Der wohl anführende Mahler, welcher curiöse Liebhaber lehret, wie man sich zur Mahleren zubereiten, mit Oel-Farben umgehen, Gründe, Fürnisse und andere darzu nöthige Sachen verfertigen, die Gemählde geschickt auszieren, vergülden, versilbern, accurat lacquiren, und saubere Kupffer-Stiche ausarbeiten solle. Diesem ist noch beygefüget ein Kunst-Cabinet rarer und geheim gehaltener Erfindungen / alles aus eigener Erfahrung aufgezeichnet von Johann Melchior Crökern. - Neueste [6th] Aufl. - Jena : Bey Dorotheen Rosinen Cröckerin, 1764. - [14], 536, [8] p. : front., [77] woodcuts ; 18 cm.
Contents: p. [8] at the beginning.
MIP: pp. 273–296, 394–396 : [14] woodcuts.
With literature.
Index: p. [1] at the back.
§ The text has been reset but the contents and illustrations are the same.
The preface is dated, p. [7]: 'Jena den 6ten Januarii, 1764. die Verlegerin'.
The woodcuts show signs of wear with bits of wood broken off.
In: BL; BLBS; BS; DBI-VK; OCLC; Priv.Coll.; *Schießl 1982* [No. 068.9]: no. 6; *Schießl 1989*: no. 477.

Der wohl anführende mahler welcher curiöse liebhaber lehret, wie man sich zur mahlerey zubereiten, mit oel-farben umgehen, gründe, fürnisse und andere dazu nöthige sachen verfertigen, die gemählde geschickt auszieren, vergülden, versilbern, accurat lacquiren, und saubere kupferstiche ausarbeiten solle. Diesem ist noch beygefüget ein Kunst-cabinet rarer und geheim gehaltener erfindungen / alles aus eigener erfahrung aufgezeichnet von Johann Melchior Crökern. - Neueste [7th] Aufl. - Jena : bey J.R. Crökers seel wittbe, 1778. - [7], 536, [8] p. : ill. ; 17 cm.
§ Title description after MET.
NOT SEEN
In: MET; NUC–1956; OCLC; *Schießl 1982* [No. 068.9]: no. 7; *Schießl 1989*: no. 478.

Der wohl anführende Mahler oder Anweisung wie man sich zur Mahlerey vorbereiten, mit Oel-Farben umgehen, Gründe, Fürnisse und andere dazu nöthige Sachen verfertigen, die Gemählde geschickt auszieren, vergolden, versilbern, lackiren, und saubere Kupferstiche ausarbeiten soll. Nebst einem Kunstcabinet seltener und geheim gehaltener Erfindungen / aus eigener Erfahrung aufgezeichnet von Johann Melchior Cröker. - Neueste [8th] sehr verbesserte Aufl. - Jena : in der Crökerschen Buchhandlung, 1804. - [2], [5], 546, [8] p. : woodcuts ; 8˚.
§ Slightly altered with some new references and Cröker's autobiographical notes are removed; *Schiessl 1982*: XX.
NOT SEEN
In: *Schießl 1982* [No. 068.9]: no. 8; *Schiessl 1989*: no. 480.

Der wohl anführende Mahler / Johann Melchior Cröker ; hrsg. und mit einer Einleitung, Bibliographie und Glossar versehen von Ulrich Schiessl. - Nachdruck. - [Mittenwald] : Mäander, cop. 1982. - XLII, [16], 536, [8] p. : front., [77] ill. ; 23.5 cm.
Literature to the introduction: p. XIV.
The different editions of Cröker: p. XVII.
Literature used by Cröker: p. XXI.
Glossary: p. XXXIV.
Contents: p. [8] at the beginning.
MIP: pp. 273–296, 394–395 : [14] ill.
Index: p. [1] at the back.
With literature
Edition: 800 copies.
ISBN 3-88219-200-3 (hardcover)
§ Photomechanical reprint of: Jena 1736 [No. 068.3].
This text and the various editions are extensively commented on by Schießl.
In: BS; DNB-F; DBI-VK; HAB; NCC; OCLC; RCE; RMA; UBH; UBU.

Der wohl anführende Mahler welcher curiöse Liebhaber lehret, wie man sich zur Mahlerey zubereiten, mit Oel-Farben umgehen, Gründe, Fürnisse und andere darzu nöthige Sachen verfertigen, die Gemählde geschickt auszieren, vergülden, versilbern, accurat lacquiren, und saubere Kupffer-Stiche ausarbeiten solle. Diesem ist noch beygefüget ein Kunst-Cabinet rarer und geheim gehaltener Erfindungen / alles aus eigener Erfahrung aufgezeichnet von Johann Melchior Crökern. - Unveränderte Nachdruck der Aufl. von 1743. - Rottenburg : Dr. Kremer-Reprint, 1987. - [14], 536, [8] p. : front., [77] ill. ; 21 cm.
Contents: p. [8] at the beginning.
Index: p. [1] at the back.
MIP: pp. 273–296, 394–395 : [14] ill.
With literature.
Edition: 200 copies.
§ Photomechanical reprint of: Jena 1743 [No. 068.4].
Without comments.
In: UBH

Crujera (Alfonso) 069

Manual del grabado electrolítico / Alfonso Crujera. - [Santa María de Guía, Las Palmas] : A. Crujera, [2008] ; [Arucas, Las Palmas] : Gráf. Guiniguada [printer?], 2008. - 150 p. : ill., partly in colour ; 21 cm.
Glossary: p. 148–150.
ISBN 978-84-612-4703-5
§ Title means: Manual for electrolytic etching
1 –
Electrolytic Etching
5 –
Health and Safety
NOT SEEN
In: BNM; KVK.

Cutner (Herbert) 070.1

Teach yourself etching : a manuel for students, artists and collectors / by Herbert Cutner. - First printed. - [London] : Hodder & Stoughton for The English Universities Press, 1947. - 148 p. : [25] reprod., [10] pl. with diagrams; 18 cm. - (The English Universities Press teach yourself books).
List with titles in the series: p. 2.
Contents: p. 5.
List of reproductions: p. 7.
Literature: p. 144.
Suppliers: p. 146.
Index: p. 147.
§ The plates with the diagrams show the different materials and techniques.
1 –
Aquatint / Drypoint / Line Etching / Soft-ground
2 –
Copper / Zinc / Steelfacing
3 –
Ink / Paper / Press / Printing in Black
4 –
Troubleshooting
5 –
Aesthetics / Art History / Conservation and Restoration
In: BL; BLBS; NUC–1956; OCLC (2×); Priv.Coll.

070.2

Teach yourself etching : a manuel for students, artists and collectors / by Herbert Cutner. - New impression. - London : English Universities Press, 1951. - 148 p. : [25] reprod., [10] diagrams ; 18 cm. - (The English Universities Press teach yourself series).
List with titles in the series: p. 2.
Contents: p. 5.
List of reproductions: p. 7.
Literature: p. 144.
Suppliers: p. 146.
Index: p. 147.
§ Identical to the first edition except for the titles in the series.
In OCLC; Priv.Coll.

D

D'Arcy Hughes (Ann) & **Vernon-Morris** (Hebe) 071.1

Printmaking : traditional and contemporary techniques / Ann d'Arcy Hughes, Hebe Vernon-Morris ; contributing authors Eric Bates … [et al.] ; ed. Nicola Hodgson ; studio photogr. Simon Punter. - Mies : Rotovision, 2008. - 416 p. : [c. 1,200] ill., mainly in colour ; 27 cm.
Contents: p. 7.

MIP: pp. 13–163 : [305] ill.
Workshops: pp. 396–402.
Artist contacts: p. 403.
Suppliers: pp. 404–405.
Literature: pp. 406–407.
Glossary: pp. 408–411.
Index: pp. 412–415.
ISBN 978-2-940361-53-3 (hardcover)
§ The illustrations are diagrams, photographs and reproductions. Processes are shown in series of photographs. Artists' statements have portraits of the artists.
Review: J. Stobart, in *Printmaking Today*, 18 (2009) 2: 34.
1 –
Aquatint / Collagraph / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Blind Embossment / Chine Collé / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Viscosity Colour Printing
4 –
Digital Printmaking / Linocut / Lithography / Monotype / Screen Printing / Troubleshooting / Woodcut / Wood Engraving
5 –
Art History
In: Priv.Coll.

071.2
The printmaking bible : the complete guide to materials and techniques / Ann d'Arcy Hughes, Hebe Vernon-Morris; contributing authors Eric Bates … [et al.] ; ed. Nicola Hodgson ; studio photogr. Simon Punter. - San Francisco : Chronicle Books, 2008. - 416 p. : [c. 1,200] ill., mainly in colour ; 27 cm.
Contents: p. 7.
MIP: pp. 13–163 : [305] ill.
Workshops: pp. 396–402.
Artist contacts: p. 403.
Suppliers: pp. 404–405.
Literature: pp. 406–407.
Glossary: pp. 408–411.
Index: pp. 412–415.
ISBN 0-8118-6228-3
ISBN 978-0-8118-6228-8
§ Identical publication, different publisher.
In: LC; Priv.Coll.

071.3
Le grand livre de la gravure : techniques d'hier à aujourd'hui / Ann D'Arcy Hughes, Hebe Vernon-Morris ; Claire Rascle [transl.]. - Paris : Pyramyd, 2010. - 415 p. : ill., mainly in colour ; 27 cm.
ISBN 2-35017-187-6 (hardcover)
ISBN 978-235017-187-6 (hardcover)
NOT SEEN
In: KVK.

Dake (Carel Lodewijk)   072
Beknopte handleiding voor de techniek der etskunst / door C[arel] L[odewijk] Dake. - Amsterdam : Scheltema & Holkema, [1894]. - 16 p. ; 19.5 cm.
Suppliers: pp. 5, 9, 15.
§ Title means: Short manual for the technique of etching
Meant for 'young artists': p. 3.
1 –
Drypoint / Line Etching
2 –
Copper
In: CCB; GMPL; KB; NCC; Priv.Coll.; RMA; UBA; UBN; UBL; UBU.

Daniels (Harvey Morton)   073.1
Printmaking / Harvey [Morton] Daniels ; photogr. Michael Holford ; diagrams Tony Truscott. - [1st ed.]. - London [etc.] : Hamlyn, 1971. - 224 p. : 201 ill. ; 27.5 cm.
Contents: p. 6.
List of colour illustrations: p. 8.
Literature: p. 11.
MIP: pp. 162–189 : ill. 145–178.
Glossary: p. 217.
Suppliers: p. 220.
Index: p. 223.
ISBN 0-600-36911-0 (hardcover)
1 –

Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint
2 –
Aluminium / Copper / Iron / Plastic / Steel / Zinc
3 –
Ink / Multiple-plate Printing / Press / Printing in Black / Printing Polychrome / Relief Printing / Screen Printing / Viscosity Colour Printing
4 –
Frottage / Monotype / Linocut / Lithography / Screen Printing / Stamping / Woodcut / Wood Engraving
5 –
Art History / Conservation and Restoration
In: BL; BLBS; CCB; OBDH; UBA.

073.2

Printmaking / Harvey [Morton] Daniels ; photogr. Michael Holford ; diagrams Tony Truscott. - [1st ed.]. - New York : Viking, 1971. - 224 p. : colour ill. ; 28 cm. - (A Studio book).
With literature.
ISBN 0-676-57757-X (hardcover)
NOT SEEN
In: BL; ULC.

073.3

Printmaking / Harvey [Morton] Daniels ; photogr. Michael Holford ; diagrams Tony Truscott. - Rev. and repr. [2nd ed.]. - London [etc.] : Hamlyn, 1972. - 224 p. : 201 ill. ; 27.5 cm.
Contents: p. 6.
List of colour illustrations: p. 8.
Literature: p. 11.
MIP: pp. 162–189 : ill. 145–178.
Glossary: p. 217.
Suppliers: p. 220.
Index: p. 223.
ISBN 0-600-36911-0 (hardcover)
In: CCB; NCC; UBA.

073.4

Printmaking / Harvey [Morton] Daniels ; photogr. Michael Holford ; diagrams Tony Truscott. - Repr. [3rd ed.] . - London [etc.] : Hamlyn, 1974. - 224 p. : 201 ill. ; 27.5 cm.
Contents: p. 6.
List of colour illustrations: p. 8.
Literature: p. 11.
MIP: pp. 162–189 : ill. 145–178.
Glossary: p. 217.
Suppliers: p. 220.
Index: p. 223.
ISBN 0-600-36911-0 (hardcover)
In: *Figueras Ferrer 1992*: 1040; Priv.Coll.

Delaborde (J.A.)
See: **Lalanne** (François Antoine Maxime) [No. 178].

Delâtre (Auguste-Marie)   074.1

Eau-forte, pointe sèche et vernis mou / par Auguste [Marie] Delâtre; lettre de Félicien Rops ; préface de Castagnary ; gravures inédites par F[élicien] Rops, H[enry] Somm, A[rmand] Point et [August Marie] Delâtre. - Paris : Lanier, Vallet, 1887. - 35, [1] p. : 6 pl. ; 26.5 cm.
Letter by Rops: p. 22–30 : pl. 6.
Supplier: p. 33.
Contents: p. [1].
§ Title means: Etching, drypoint and soft-ground
The letter by Rops on soft-ground etching is dated: '15 novembre 1886'. See also: **Rops** (1873–1894) [No. 271].
All plates are printed by Delâtre.
The *planches* are etchings and drypoints and therefore specimens of the processes described.
1 –
Aquatint / Drypoint / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Printing in Black
In: BL; *Blas Benito 1994*: 68; BLBS; BN; *Figueras Ferrer 1992*: 1040; NUC–1956; OCLC; RKD; *Singer & Strang 1897*: no. 341; UBA.

074.2

Félicien Rops, 1833–1898 : lithographies, gravures, dessins, peintures / coord. Jean Hanon, Guy Cuvelier. - Namur : Musée Félicien Rops, [c. 1986?]. - 96 p. : [62] reprod., of which [5] in colour ; 20 × 20 cm.
Letter by Rops: p. 49–54.
Contents: p. 5.
Biography: p. 78.
Literature: p. 80.
Catalogue raisoné: p. 87.

§ Re-edition of the letter Rops wrote to Delâtre about his soft-ground technique and some other techniques. Missing are Rops' address, the quote by Alfred Musset and the note about the dust-grain technique. Rops' soft-ground plate is not reproduced. The spelling is the same, some paragraphs are joined together, quotation marks are removed and italics straightened.

1 –
Aquatint / Mezzotint / Soft-ground
2 –
Copper
5 –
Art History
In: Priv.Coll.

Deleschamps (Pierre)   075.1

Des mordans, des vernis et des planches, dans l'art du graveur, ou traité complet de la gravure / par Pierre Deleschamps. - Paris : chez Mme Huzard [née Vallat la Chapelle], 1836. - xv, 284 p. : [1], 3 pl. ; 23 cm.
Other titles in the series: p. II.
MIP: pp. iiI–xv, 1–174 : 3 pl.
Index: p. 273.
With literature.
§ Title means: Acids, grounds and plates in the art of the engraver, or complete treatise on engraving
Some of the etching ground recipes (pp. 56–58) are copied from **Bosse** (Paris 1745) [No. 042.8] 3–4, 49–50. Parts of Deleschamp's work are copied in **Perrot** (Paris 1844) [No. 234.2] and from Perrot in **Villon** (Paris 1894) [No. 349]. *Planche* 1 shows Longhi's turntop working desk; **Longhi** (1793) [No. 510].
Deleschamps is the first author with a chemical background to write about etching intaglio printing plates, which makes his manual very modern for his time compared with all earlier manuals.
P. III–XV and pl. [1] are: Rapport sur un nouveau mordant pour la gravure sur acier / présenté par M. Deleschamps ; raport fait par A. Chevallier au nom d'une commission spéciale. Offprint from: Bulletin de la Societé d'Encouragement pour l'Industrie nationale, (1835), no. CCCLXXI (May): III–XV, pl. 62. See: **Deleschamps** (1835) [No. 423].
The report is dated, p. XV: 'Approuvé en séance, le 13 mai 1835'.
1 –
Aquatint / Crayon Engraving / Line Engraving / Line Etching / Ruling Machine / Stipple Engraving
2 –
Bronze / Copper / Glass / Steel / Stone / Tin / Type Metal / Zinc
3 –
Ink / Multiple-plate Printing / Printing à la Poupée / Printing Polychrome
4 –
Line block / Photography / Woodcut / Wood Engraving
5 –
Art History
In: BL; *Blas Benito 1994*: 68; BLBS; BN; *Figueras Ferrer 1992*: 1040; NUC–1956; OCLC; Priv.Coll.; RMA; *Singer & Strang 1897*: no. 145.

075.2

Vollständiges Handbuch der Gravirkunst, enthaltend gründliche Belehrungen über die Aetzwässer, die Aetzgründe, die Platten und die Gravirmaschinen. Für Kupfer- und Stahlstecher, Lithographen, Graveurs, Holz-, Schrift- und Stempelschneider etc. / von Pet[er] Deleschamps ; Deutsch bearbarbeitet und mit Zusätzen versehen von Christ[ian] Heinr[ich] Schmidt. - Quedlinburg ; Leipzig : Gottfr[ied] Basse, 1838. - VIII, 196, [4] p. : 8 Taf., folding ; 21 cm.
Contents: p. VI.
Stocklist: p. [1].
§ Translation of the edition: Paris 1836.
The *Tafel* are original and not copied after the French edition.
Comments: **Roller** (Wien 1911) [No. 270.3]: 124–125.
In: DBI-VK; MLU; NUC–1956; OCLC; *Singer & Strang 1897*: no. 152; UBAB.

Denaro (Furio de)
See: **Tempesti** (Domenico) [No. 334].

Denison (Herbert)   076.1

A treatise on photogravure in intaglio by the Talbot-Klic process / by Herbert Denison ; historical notes by Tho[ma]s Bolas. - London : Iliffe, [1895?]. - 140 p. : 8 fig., 2 pl. ; 23 cm.
Contents: p. 6.
Specimens: 2 plates.
§ Although strictly speaking this book does not fit within the boundaries of the present bibliography – and the author does indeed make a distinction between the 'etcher' as opposed to the 'photograveur' (p. 92) – its close relation to the manual processes (plate preparation, application of aquatint, printing) makes it informative about the same processes that are used by 'etcher' and 'photograveur'.
Not dated, but 1895 or a little earlier because the author is referred to in **Sanger Shepherd** (1895) [No. 573].
P. 95: 'The plates in this book are printed on a Japanese paper.' NB: plates are often missing in copies.
P. 3: 'The author trusts that his labours may enable many who are now strangers to the process to experience some of the pleasures enjoyed by himself in becoming intimately acquatinted with its resources.' He is clearly writing for amateurs and professional photographers who want to print their own plates, not for industrial photo-engravers.
Photomechanical reprint: Rochester 1974.
1 –
Aquatint / Photomechanical Etching

2 –
Copper / Steelfacing
3 –
Ink / Paper / Press / Printing in Black
5 –
Art History
In: BL; LC; NLS; RMA; WLL.

A treatise on photogravure / Herbert Denison. - Repr. - Rochester, NY : The Visual Studies Workshop, Light Impressions, 1974. - 140 p. : 8 fig. ; 21 cm. - (The visual studies workshop reprint series).
Contents: p. 6.
ISBN 0-87992-004-1 (softcover)
ISBN 0-87992-005-X (hardcover)
§ Photomechanical reprint of: London [1895].
In: LC; Priv.Coll.

Dohmen (Walter)   077
Der Tiefdruck. Vom Kupferstich bis zur Fotoradierung : Geschichte - Kunst - Technik / Walter Dohmen. - Köln : DuMont, cop. 1986. - 315, [1] p. : front., 175 b/w ill., 23 colour ill. ; 18 cm. - (DuMont-Taschenbucher ; 180).
Contents: p. 5.
Index on tools and materials: p. 298.
Suppliers: p. 299.
Glossary: p. 304.
Literature: p. 304.
Index on persons and subjects: p. 307.
Stocklist: p. [1].
ISBN 3-7701-1658-5 (softcover)
§ Title means: Intaglio printmaking. From engraving to photo-etching: history – art – technique
The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Carborundum print / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Relief Etching / Soft-ground
2 –
Aluminium / Brass / Copper / Iron / Magnesium / Plastic / Steel / Steelfacing / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Art History / Health and Safety
In: ABK; DNB-F; DBI-VK; DNB-L; HGKB; KB; NSUG; OCLC; Priv.Coll.; RMA; UBH; UBAB (inc.); UBLz.

Domingo (Francesc)   078
Principios técnicos de calcografia : manual do aguafortista / Francesc Domingo. - [Sao Paulo?] : [s.n.], [1956?]. - 31 p. ; 16 cm.
§ Title means: Technical principles of intaglio printmkaing; manual of the etcher
NOT SEEN
In: BCB; BNM; *Figueras Ferrer 1992*: 1041.

Donjean (A.)   079.1
La gravure à l'eau-forte : traité pratique et simplifié a l'usage des artistes, élèves & amateurs / par A. Donjean. - [1st ed.]. - Paris : Le Bailly, 1889. - 48 p. : front. ; 22.5 cm. - (Bibliothèque artistique).
Titles in the series: backside cover.
§ Title means: Engraving with acid: practical and simplified treatise for the use of arists, pupils and amateurs
The name of the publisher Le Bailly is pasted over with the label: 'Paris : Dupré'.
The frontispiece is an etching.
Reprint: Paris 1980.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Rubbing
5 –
Art History
In: BN; Priv.Coll.

079.2
La gravure à l'eau-forte : traité pratique et simplifié a l'usage des artistes, élèves & amateurs / par A. Donjean. - [? ed.]. - Paris : Bornemann, [s.a.]. - 48 p. ; 23 cm. - (Collection artistique).
Titles in the series: backside cover.
§ The text has been reset.
Printer, p. 48: 'Enghlen-les-Bains: E. Veillon. 2–27–9207'.
With a different cover and without frontispiece.

In: BNL; *Figueras Ferrer 1992*: 1042 (?); Priv.Coll. (2×).

079.3

La gravure à l'eau-forte : traité pratique et simplifié a l'usage des artistes, élèves & amateurs / par A. Donjean. - Paris : [Bornemann?], 1949.
NOT SEEN
In: *Blas Benito 1994*: 78.

079.4

Initiation à la gravure : traité pratique et simplifié à l'usage des artistes, élèves et amateurs / A. Donjean. - Paris : Bornemann, 1972. - 48 p. : ill. ; 22 cm.
ISBN 2-85182-009-5
NOT SEEN
In: KVK.

079.5

Initiation à la gravure : eau-forte, pointe seche, aqua-tinte, burin / A. Donjean ; illustrations et photos de Jacques Rayez. - Paris : Bornemann, 1975. - 48 p. : ill. ; 24 cm.
ISBN 2-85182-009-5
§ The text has been reprinted without any changes several times given the different years (1980, 1984) of the *dépôt légal* found in different copies.
NOT SEEN
In: *Blas Benito 1994*: 78; BNM; *Figueras Ferrer 1992*: 1042; KVK; OCLC.

079.6

Initiation à la gravure : eau-forte, pointe seche, aqua-tinte, burin / A. Donjean ; illustrations et photos de Jacques Rayez ; photo couverture Jacques Vainstain. - Reéd. - Paris : Bornemann, 1980. - 48 p. : 10, [7] fig. : 24 cm. - (Initiation).
Titles in the series: p. 2.
List of suppliers: p. 2.
ISBN 2-85182-09-5 (softcover)
§ Reprint of: Paris 1889.
P. 1: '© 1976'. P. 48: 'Dépôt légal 1er trimestre 1980'.
The text is nearly identical to the original edition, with an additional chapter on intaglio printing.
1 –
Aquatint /Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Printing in Black / Printing Monochrome / Paper / Press / Rubbing
5 –
Art History
In: Priv.Coll.

079.7

Initiation à la gravure : eau-forte, pointe seche, aqua-tinte, burin / A. Donjean ; illustrations et photos de Jacques Rayez ; photo couverture Jacques Vainstain. - Reéd. - Paris : Bornemann, 1984. - 48 p. : 10, [7] fig. : 24 cm. - (Initiation).
Titles in the series: p. [2].
ISBN 2-85182-009-5 (softcover)
§ P. 1: '© 1976'. P. 48: 'Dépôt légal effectué: Novembre 1984'.
In: KVK; Priv.Coll.

Dossie (Robert)   080.1

The handmaid to the arts / [comp. by Robert Dossie]. - [1st ed]. - London : printed for J. Nourse, 1758. - 2 vol. ; 8º.
§ The publication is anonymous, but is attributed to Robert Dossie.
– Vol. 1: Teaching, I. A perfect knowledge of the materia pictoria: or the nature, use, preparation, and composition, of all the various substances employed in painting; as well vehicles, dryers, &c. as colours: including those peculiar to enamel and painting on glass. II. The several devices employed for the more easily and accurately making designs from nature, or depicted representations; either by off-tracing, calking, reduction, or other means: with the methods of taking casts, or impressions, from figures, busts, medals, leaves, &c. III. The various manners of gilding, silvering, and bronzing, with the preparation of the genuine gold and silver powders, and imitations of them, as also of the fat oil, gold sizes, and other necessary compositions: - the art of Japanning as applicable not only to the former purposes, but to coaches, snuffboxes, &c. in the manner lately introduced: - and the methods of staining different kinds of substances, with all the several colours. The whole being calculated, as well for conveying a more accurate and extensive knowledge of the matters treated of to artists; as to initiate those, who are desirous to attempt these arts, into the method of preparing and using all the colours, and other substances employed in painting in oil, miniature, enamel, varnish, and fresco; as also in gilding, &c. - xxiv, [8], 448, [14] p. : [1] woodcut.
Contents: p. [1] at the beginning.
MIP: pp. 363–364.
Index: p. [1] at the back.
Stocklist: p. [14] at the back.
– Vol. 2: Volume the second. Teaching, I. The preparation of inks, cements, and sealing-wax, of every kind. II. The art of engraving, etching, and scraping mezzotintoes; with the preparation of the aqua fortis, varnishes, or grounds, &c. in the best manner now practised by the French: as also the manner of printing copper-plates; an improved method of producing washed prints; and of printing in chiaro oscuro, and with colours, in the way practised by Mr. Le Blon. III. The nature, composition, and preparation of glass of every sort. As also the various methods of counterfeiting gems of all kinds, by coloured glass, pastes, doublets, or the use of foils. IV. The nature and composition of porcelain; as well according to the methods practised in China, as in the several European manufactories: with the best manner of burning, glazing, painting, and gilding the ware. V. The manner of preparing and moulding papier maché, and whole paper, for the forming boxes, frames, festoons, &c. and of varnishing, painting, and gilding the pieces of each kind: with the method of making the light Japan-ware. To which is added, an appendix containing several supplemental articles belonging, in some manner, to heads before treated of, either in this or the first volume: particularly, the method of marbling

paper, of taking off paintings from old and transferring them to new cloths, of weaving tapestry, both by the high and low warp; of manufacturing paper hangings of every kind; and of preparing transparent and coloured glazings for earthen and stone ware: with several other particulars. - xv, [13], 448, [12] p.

Contents: p. [1], at the beginning.

Printing ink: pp. 15–18.

MIP: pp. 41–218.

Index: p. [1] at the back.

Stocklist: p. [12] at the back.

With literature.

§ Reworked and commented translation after: **Bosse** (Paris 1745) [042.2]. The cited passages are placed between quotation marks.

The section on mezzotint (2: 173–182, or from a later edition) is summarised and quoted in **Compendium** (London 1797) [No. 067]: 190–192; the definition of the term 'Ground for etching' in its glossary and recipes for etching grounds by Rembrandt, Callot and others are probably taken from Dossie, too. The part on the appearance of the engraved print (2: 62–69, or from a later edition) is partly summarised and partly quoted in **Fielding** (London 1841) [No. 100]: 34–58.

1 –

Échoppe / Line Engraving / Line Etching / Mezzotint

2 –

Copper

3 –

Casting / Counterproof / Ink / Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome

4 –

Monotype / Nature Printing / Woodcut

5 –

Aesthetics / Art History

In: BL; BCIN; BLBS; BN (2×); *Bridson & Wakeman 1984*: nos. B6, B69, B82; CCI; ESTC: no. t116409 (31×); *Levis 1912*: 87–88, 118; NUC–1956, vol. 147 (8×); OCLC; *Singer & Strang 1897*: no. 47.

080.2

The handmaid to the arts / [comp. by Robert Dossie]. - The second ed., with considerable additions and improvements. - London : printed for J. Nourse, 1764. - 2 vol. : ill. ; 23 [?] cm.

§ The text has been reset with the same contents, spelling revised, and some mistakes corrected. *Bridson & Wakeman*: 'Slightly revised version of the 1758 edition.'

There are four issues of this edition; the title pages are different, the rest is the same:

(1) ESTC, no. n032883 (1×): 'In this second edition the vol. 1 title page, eighth line, reads: "teria pictoria; or, the nature,"; the second line of the imprint reads: "printed J. Nourse, bookseller in ordinary to his". - The title page to vol. 2 reads: "... Teaching, I. The preparation of inks, ... VI. The manner of preparing and moulding papier mache, ..."'.

(2) ESTC, no. n032886 (2×): 'In this second edition the vol. 1 title page, eighth line, reads: "materia pictoria; or, the"; the second line of the imprint reads: "printed for J. Nourse, bookseller in ordinary to his". - The title page to vol. 2 reads: "... Teaching, I. The preparation of inks, ... VI. The manner of preparing and moulding papier mache. ..."'.

(3) ESTC, no. t125947 (14×): 'In this second edition in vol. 1 the eighth line of the tile reads: "materia pictoria: or the", the second line of imprint reads: "printed for J. Nourse, bookseller in ordinary" and on p. [1] sig. B is under "c" of "tenacity"'.

(4) ESTC, no. t125950 (13×): 'In this second edition in vol. 1 the eighth line of the title reads: "teria pictoria, or, the nature," the second line of imprint reads: "printed for J. Nourse, bookseller in ordinary to his" and on p. [1] sig. B is under the "e" of "tenacity"'.

– Vol. 1: Volume the first. Teaching, I. A perfect knowledge of the materia pictoria; or, the nature, use, preparation, and composition, of all the various substances employed in painting, as well vehicles, dryers, &c. as colours; including those peculiar to enamel and painting on glass. II. The means of delineation, or the several devices employed for the more easily and accurately making designs from nature, or depicted representations; either by off-tracing, calking, reduction, or other means; with the methods of taking casts, or impressions, from figures, busts, medals, leaves, &c. III. The various manners of gilding, silvering, bronzing, with the preparation of the genuine gold and silver powders, and imitations of them, as also of the fat oil, gold sizes, and other necessary compositions; - the art of Japanning, as applicable not only to the former purposes, but to coaches, snuffboxes, &c. in the manner lately introduced; - and the methods of staining different kinds of substances, with all the several colours. The whole being calculated, as well for conveying a more accurate and extensive knowledge of the matters treated of to professed artists, as to initiate those who are desirous to attempt these arts, into the method of preparing and using all the colours, and other substances employed in painting in oil, miniature, crayons, encaustic, enamel, varnish, distemper, and fresco, as also in gilding, &c. - xxvii, [9], 522, [10] p. : ill.

Contents: p. [1], at the beginning.

Index: p. [1], at the back.

MIP: pp. 418–419.

– Vol. 2: Volume the second. Teaching, I. The preparation of inks, cements, and sealing-wax, of every kind. II. The art of engraving, etching, and scraping mezzotintos; with the preparation of the aqua fortis, varnishes, or other grounds, &c. in the best manner now practised by the French; as also the best manner of printing copper-plates; an improved method of producing washed prints, and of printing in chiaro obscuro, and with colours, in the way practised by Mr. Le Blon. III. The nature, composition, and preparation of glass of every sort; as also the various methods of counterfeiting gems of all kinds, by coloured glass, pastes, doublets, or the use of foils. IV. The nature and composition of porcelain, as well according to the methods practised in China, as in the several European manufactories; with the best manner of burning, glazing, painting, and gilding the ware. V. Preparation of transparant and coloured glazings, for stone or earthen-ware. VI. The manner of preparing and moulding papier mache, and whole paper, for the forming boxes, frames, festoons, &c. and of varnishing, painting, and gilding the pieces of each kind; with the method of making the light Japan-ware. To which is added an appendix; containing several supplemental articles belonging, in some manner, to heads before treated of, either in this or the first volume; particularly, the method of marbling paper, of taking off paintings from old and transferring them to new cloths; of weaving tapestry, both by the high and low warp; and of manufacturing paper hangings of every kind. - xiv, [14], 462, [10] p. : ill.

Contents: p. [1], at the beginning.

Printing ink: pp. 15–18.

MIP: pp. 43–216.

Index: p. [1], at the beginning.

§ Some details added on damping the paper (pp. 198–199) and on running the plate through the press twice (double run, pp. 205–206).

In: *Bigmore & Wyman 1880–1886*, 1: 298; BL (2×); BS (under 'Handmaid', 'Nicht mehr vorhanden'); *Bridson & Wakeman 1984*: nos. B6, B69, B82; CCB; DBI-VK; ESTC, nos. n032883, n032886 (2×), t125947 (14.), t125950 (13×); KB; *Levis 1912*: 88; NUC–1956, vol. 147 (9×); OCLC; *Singer & Strang 1897*: no. 52; ULC.

080.3

The handmaid to the arts / [comp. by Robert Dossie]. - A new [3rd] ed., with considerable additions and improvements. - London [= York?] : printed for A. Millar, W. Law and R. Cater ; York : Wilson, Spence and Mawman, 1796. - 2 vol. ; 8º or 12º

§ ESTC: 'Anonymous. By Robert Dossie'.

ESTC: 'The London part of the imprint is false; probably printed at York.'

– Vol. 1: XXV, [3], 344 p.

– Vol. 2: XX, 324 p.

NOT SEEN

In: BL (2×); BLBS; *Bridson & Wakeman 1982*, nos. B6, B69, B82; ESTC: no. t129094 (12×); *Levis 1912*: 88; NUC–1956, vol. 147 (6×); NUC 1982, vol. 5; OCLC; *Singer & Strang 1897*: no. 75.

Dougall (John)   081

NB: See also: **Bowles** (Carington) [No. 045]; **Hodson 2** (Thomas) [No. 147].

081.1

The complete young man's companion; or, self instructor: being an introduciton to all the various branches of useful learning and knowledgte … to which is added, The artist's assistant: comprising the arts of drawing, perspective, etching, engraving, mezzotinto scraping, painting, colouring of maps, &c &c. - Manchester : printed by Sowler and Russel, 1801. - VIII, 495, [1] p. : front, [6] pl. ; 21 cm.

§ Given the number of copies in OCLC this book might have been produced for the North American market.

The bibliography of this text needs further clarification.

Spelman: 'An adaption of Carrington Bowles *Artist's Assistant* [No. 045] which was pirated to add artistic instructions to various provincially printed self-help manuals in the early 19th century. cf. *The Self Instructior, or, Young Man's Best Companion*, Liverpool, c1814.'

NOT SEEN

In: OCLC; *Spelman 2002*, cat. 48 (Nov.): 17, no. 30.

081.2

The self instructor, or, young man's best companion : being an introduction to all the various branches of useful learning and knowledge. Containing writing, grammar, arithmetic, astronomoy, geography, chronology, and miscellaneous articles. To which is added, The artist's assistant : comprising the arts of drawing, perspective, etching, engraving, mezzotinto scraping, painting, dyeing, colouring of maps, etc. : a brief account of naval and military affairs : also, various useful medicinal receipts. - Liverpool : printed and published by Nuttall, Fisher and Dixon, 1807. - [2], 593, [3] p. : 6 pl. ; 22 cm.

NOT SEEN

In: OCLC (2×).

081.3

The self instructor, or, young man's best companion : being an introduction to all the various branches of useful learning and knowledge. Containing writing, grammar, arithmetic, astronomoy, geography, chronology, and miscellaneous articles : to which is added, The artist's assistant : comprising the arts of ... engraving, etching ... : a brief account of naval and military affairs : also, various useful medicinal receipts. - Liverpool : printed and published by Nuttall, Fisher and Dixon, 1808.

NOT SEEN

In: OCLC.

081.4

The complete young man's companion; or, self instructor; being an introduction to all the various branches of useful learning and knowledge. Containing writing, grammar, arithmetic, geography, chronology, and miscellaneous articles. To which is added, The artist's assistant: comprising the arts of drawing, perspective, etching, engraving, mezzotinto scraping, painting, colouring of maps &c. &c. - Manchester : printed by Russel and Allen, 1810. - VIII, 495, [1] p. : front., [7] pl., [3] ill., tab. ; 22 cm.

Contents: p. V.

MIP: pp. 465–472.

List of plates: p. [1] at the back.

§ The part 'The artist's assistant' is taken from **Bowles** (London 1760) [No. 045], with some additional information. The part on intaglio printmaking is nearly identical to Bowles.

The frontispiece and the plates are etchings, the illustrations are woodcuts.

1 –

Line Engraving / Line Etching / Mezzotint

2 –

Copper

3 –

Print behind Glass

4 –

Drawing / Painting

5 –

Aesthetics

In: BL.

081.5

The self instructor, or, young man's best companion : being an introduction to all the various branches of useful learning and knowledge. Containing writing, grammar, arithmetic, astronomoy, geography, chronology, and miscellaneous articles : to which is added, The artist's assistant : comprising the arts of ... engraving, etching ... : a brief account of naval and military affairs : also, various useful medicinal receipts. - Liverpool : printed and published by Nuttall, Fisher and Dixon, [1810?].

NOT SEEN

In: OCLC.

The young man's best companion and guide to useful knowledge / by John Dougall. - Bungay : T. Kinnerley, 1815. - VII, 476 p. : front., ill., pl. ; 23 cm.
§ OCLC: 'Add. t.p. engr.: The young man's companion'.
NB: uncertain if this is the same text.
NOT SEEN
In: OCLC.

The young man's best companion and guide to useful knowledge / by John Dougall. - Bungay : J. and R. Childs, 1821.
§ OCLC: 'Add. t.p. engr.: The young man's companion'.
NB: uncertain if this is the same text.
NOT SEEN
In: OCLC.

The self instructor, or, young man's best companion ... To which is added, The artist's assistant; comprising the arts of drawing, perspective, etching, engraving, mezzotinto scraping, painting, dyeing, colouring of maps, etc. ... [etc.]. - A new and improved ed. - London : H. Fisher, Son and Co., 1837.
§ OCLC: 'Added t.-p., illustrated: The young man's companion: or Self-instructor. 1834.'
NOT SEEN
In: OCLC.

Self-instructor, or, young man's best companion; being an introduction to all the various branches of useful learning and knowledge. containing writing, grammar, arithmetic, astronomy, geography, chronology, and miscellaneous articles. to which is added, the artist's assistant; comprising the arts of drawing, perspective, etching, engraving, mezzotinto scraping, painting, dyeing, colouring of maps, etc. a brief account of naval and military affairs. also, various useful medicinal receipts. - [New and improved ed.]. - London : H. Fisher, 1834. - [4], 593, [3] : ill. ; 8º.
NOT SEEN

The self instructor, or, young man's companion : being an introduction to various branches of usefull knowledge ... [etc.] / by John Dougall. - London : M'Gowan, 1839, - 720 p. : 2 fol. pl. ; 24 cm.
§ OCLC: 'Added t.p., with vignette, has title: The young man's companion.'
NOT SEEN
In: OCLC.

The self instructor, or, young man's companion : being an introduction to various branches of usefull knowledge ... [etc.] / by John Dougall. - Halifax : printed and published by William Milner, 1847. - IV, 764 p. : front, [2] folding maps, wood engravings ; 21 cm.
Correspondence with Barry McKay, d.d. 01 July 2003: 'I can confirm that there is no "Artist's Assistant" within.'
NOT SEEN
In: *McKay*, cat. 70 (2003): no. 282.

The self instructor, or, young man's best companion ... To which is added, The artist's assistant; comprising the arts of drawing, pervective, etching, engraving, mezzotinto scraping, painting, dyeing, colouring of maps, etc. ... [etc.]. - New and improved ed. - London : Fisher, [1840]. - 593 p. : 10 folding pl., map ; 22 cm.
NOT SEEN
In: OCLC.

The self instructor, or, young man's best companion ... To which is added, The artist's assistant; comprising the arts of drawing, pervective, etching, engraving, mezzotinto scraping, painting, dyeing, colouring of maps, etc. ... [etc.]. - New and improved ed. - London : Fisher, [1849]. - 593 p. : 10 folding pl., map ; 22 cm.
NOT SEEN
In: OCLC.

The self instructor, or, young man's companion : being an introduction to various branches of usefull knowledge ... [etc.] / by John Dougall. - Halifax : Milner and Soverby, 1863. - 571 p. : front., [2] folding pl. ; 23 cm.
NOT SEEN
In: OCLC.

Dröge (Karl)

Die Preßspanradierung / von Karl Dröge; Bildmaterial von [Karl] Dröge, Schülern der Kunstgewerbeschule Hannover und Volksschülern. - Berlin : Heintze & Blanckertz, [c. 1930]. - 24 p. : 16 Abb. ; 21.5 cm. - (Tif-Jugend-Bücherei ; 1).
Advertisement: pp. 20–23.
Stocklist: p. 24.
§ Title means: Drypoint on pressed board (Preßspan)
1 –
Crayon Engraving / Drypoint / Mezzotint
2 –
Cardboard
3 –
Printing in Black / Rubbing
In: DNB-L; TUB.

Précis élémentaire de gravure sur cuivre / par Henri [Joseph] Dubouchet et G[ustave] Dubouchet. - Paris : Leroux, [1891?]. - [4], 90, [2] p. : 61 ill. ; 18–19 cm. - (Bibliothèque de l'art pratique).
List of titles in the series: p. [2] at the beginning.
Glossary: p. 77.
Contents: p. 89.
Advertisements: p. [1] at the back.
Stocklist: backside cover.
§ Title means: Elementary course on copper engraving
Dating uncertain, perhaps the book was published in 1890 or there might have been an earlier edition published in 1890.
1 –
Crayon Engraving / Line Engraving / Line Etching / Mezzotint
2 –
Bronze / Copper
5 –
Art History
In: *Blas Benito 1994*: 68; BN; MET; NCC; NUC–1956; UBA; UBU.

L'art de graver au pinceau, à la plume ... [etc.] / [Abraham] Louis [Rodolphe] Ducros. - Rome : […], 1785.
§ The treatise was announced in *Meusel 1786*, p. 246: 'Der Landschaftmaler Ducros, der in Gesellschaft mit Volpato die Aussichten von Rom in Farben hrsg. hat, arbeitet an einem Werke, in dem er alle seine Entdeckungen und Kenntnisse in der Art mit dem Pinsel in Kupfer zu ätzen, bekannt machen wird. Er wird auch die Kunst mit der Feder oder Rohr in Kupfer zu ätzen, desgleichen die Kunst in verschiedenen Tinten zu ätzen, um die Zeichnungen nachzumachen, hinzufügen.'
Tischbein (Cassel 1790) [No. 337.1]: note on p. 6, writes that the treatises on aquatint by Ducros and **Stapart** [No. 319] are unclear: 'Dieses ist der Fall von oben erwähnten Manieren, mit dem Pinsel in Kupfer zu stechen, von Herr Stappart, und einer andern ähnlichen von Msr. du Cros, welche im Jahr 1785 zu Rom erschienen ist; Beyde enthalten Weitläufigkeiten, welche widersinnig sind.' The same sentence is found in the edition Zwickau 1827 [No. 337.3], except that the word *widersinnig* (absurd) is omitted. This seems to suggest that the manual did exist. *Thieme Becker* (10: 48, 'Ducross') was in doubt as to whether it was issued. Chessex, in his monograph on Ducros, confirms the treatise was never published, however; *Chessex 1987*: 16.
NOT PUBLISHED

Dyck (Antonie van)
See: **Van Dyck** (Antonie) [No. 343].

E

Die Anwendung des Zincs statt der Stein- und Kupferplatten zu den vertieften Zeichnungsarten. Nebst einer Anweisung Metalabgüsse, von erhaben- und tiefgeätzten Steinzeichnungen zu machen / dargestellt von H[einrich] W[ilhelm] Eberhard ; [(...) Börner inv. et scu., Eberhard inv. et scu.]. - Darmstadt : C.W. Leske, 1822. - [8], 36 p. : 10 Probeblätter ; 18 cm.
Contents: p. [7].
§ Title means: The use of zinc instead of stone and copper plates for intaglio printmaking. With a description of how to make metal casts from drawings in stone in relief and intaglio
P. 23: the *Probeblätter* are etchings.
1 –
Aquatint / Soft-ground
2 –
Zinc
3 –
Printing in Black
4 –
Lithography / Typography
5 –
Health and Safety
In: BL; BLBS; BS ('Nicht mehr vorhanden'); DBI-VK; GV); NUC–1956; OCLC; ÖNB; RMA; *Singer & Strang 1897*: no. 111.

Etching / Leonard Edmondson. - [1st ed.]. - New York [etc.] : Van Nostrand Reinhold, [1973]. - 136 p. : [197] ill., 16 reprod. in colour ; 28.5–29 cm.
Contents: p. 5.
Literature: p. 132.
Glossary: p. 132.
Index: p. 135.
ISBN 0-442-22235-1 (hardcover)
§ The illustrations are diagrams, photographs and reproductions.
The book is intended for those who want to learn the etching technique but also for printmakers and print collectors.

1 –
Aquatint / Collagraph / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Aluminium / Brass / Cardboard / Copper / Iron / Wood / Zinc
3 –
Casting / Blind Embossment / Jigsaw Print / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Decalcomania / Lithography / Screen Printing / Woodcut
5 –
Aesthetics / Conservation and Restoration
In: *Blas Benito 1994*: 78; BLBS; BNB50; NCC; OCLC (18×); Priv.Coll.; TUD; ULC.

086.2

Etching / Leonard Edmondson. - [2nd ed.]. - New York [etc.] : Van Nostrand Reinhold, [1979]. - 136 p. : [197] ill., 16 reprod. in colour ; 28 cm.
Contents: p. 5.
Literature: p. 132.
Glossary: p. 132.
Index: p. 135.
ISBN 0-442-22239-4 (softcover)
In: BL; BNB77; OCLC; Priv.Coll.

Ehrström (Eric O.W.) 087.1

Konsthantverk. Teknisk rådgivare / Eric O.W. Ehrström. - Helsingfors : Holger Schildts Förlagsaktiebolag, 1924. - 224 p. : [129] fig., XXIV [?] bilage ; 18 cm.
Contents: p. 7.
MIP: pp. 118–136 : fig. 52–68, bilage XIV, XVI–XXII.
Literature: p. 136.
§ Title means: Craft. Technical advisor
Printer: Helsingfors: Holger Schildts Tryckeri, 1924.
The *figurerar* are diagrams, the *bilage* are reproductions. The chapter on intaglio processes has 19 figures, but the numbering is not continuous. There are figures '53A' en '53B', the next one is not numbered and is followed by figure '54'. The edition Stockholm 1924 is the same but the numbering is continuous in the Finnish translation (Helsingissä 1924). Reproductions XIV and XIV are placed in the section on woodcutting and wood engraving. The reproductions are ordered slightly differently in the two Swedish editions (Helsingfors 1924, Stockholm 1924) and the Finnish translation (Helsingissä 1924).
The recipe for soft-ground in **Ehrström** (Helsingors 1924, p. 129) is the same as in **Blom** (Helsingfors 1922, p. 6), without reference. The part on troubleshooting in **Ehrström** (Helsingors 1924, pp. 134–136) is translated after **Seibold** (Esslingen 1909, seen 1920, pp. 69–74), with reference, while fig. 64 and 66 are also after Seibold (seen 1920, Abb. 1, 7).
Ehrström has been a model for: Konsthantverk / av Åke H. Huldt. - Stockholm : Wahlström & Widstrand, 1944. Huldt's book is descriptive, has a selection of paragraphs from Ehrström and is illustrated with modern material.
Title description after partial photocopy.
1 –
Aquatint / Crayon Engraving / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Press
4 –
Troubleshooting / Woodcut / Wood Engraving
5 –
Conservation and Restoration
In: HELKA.

087.2

Konsthantverk. Teknisk rådgivare / Eric O.W. Ehrström. - Stockholm : Albert Bonniers Förlag, 1924. - 224 p. : [129] fig., XXIV [?] bilage ; 18 cm.
Contents: p. 7.
MIP: pp. 118–136 : fig. 52–68, [8] bilage.
Literature: p. 136.
§ Reproductions are in a slightly different order compared to the editions: Helsingfors 1924 and Helsingissä 1924.
Printer, back of title page: Helsingfors: Holger Schildts Tryckeri, 1924.
Title description after partial photocopy.
In: LIBRIS (3×).

087.3

Taidekäsityö: teknillinen opas / Eric O.W. Ehrström ; suomentanut Frans Nykänen [= transl.]. - [1st ed.]. - Helsingissä : Kustannusosakeyhtiö Otava, 1924. - 229 p. : 129 tekstikuvaa, XXIV liitettä ; [c. 22] cm.
Contents: p. 7.
MIP: pp. 123–141 : kuva 52–70, liite XV–XXII.
Literature: p. 141.
§ Title means: Craft. Technical advisor
Manual on various crafts with a chapter on printmaking techniques.
The *tekstikuvaa* (*kuvaa*) are diagrams, the *kuvaliitettä* (*liite*) are reproductions. Figures and reproductions are the same as in the edition Helsingfors 1924. All reproductions relevant to manual intaglio processes are now within its text, the numbering of the figures is now continuous and the order

of the reproductions has been changed.
Title description after: Fiskars 1998 [No. 087.4].
In: HELKA.

087.4

Taidekäsityö : teknillinen opas / Eric O.W. Ehrström ; suomentanut Frans Nykänen. - 2. Painos. - Fiskars : Suomen Antiikki–ja Taidekirjat Oy, 1998. - 229 p. : 129 tekstikuvaa, XXIV liite ; 21 cm.
Contents: p. 7.
MIP: pp. 123–141 : kuva 52–70, liite XV–XXII.
Literature: p. 141.
ISBN 952-5240-01-0
§ This second edition is a photomechanical reprint: Helsingissä 1924 [No. 087.3].
In: HELKA.

Elexpuru (Txema) 088

Las resinas sintéticas y su aplicación al grabado / Txema Elexpuru. - Bilbao : Bilbao Bizkaia Kutxa, 1995. - 132 p. : 5 diagrams, [9] reprod., [3] tab. ; 21 cm. - (Grabados & dibujos : historia, crítica, técnica ; 6).
Index: p. 9.
Literature: p. 129.
ISBN 84-8056-134-3 (softcover)
§ Title means: Synthetic resins and their use in engraving (= intaglio printmaking)
1 –
Carborundum Print / Collagraph
2 –
Plastic
3 –
Blind embossment / Ink / Multiple-plate Printing / Paper / Printing in Black / Printing à la Poupée / Printing Polychrome / Relief Printing
5 –
Health and Safety
In: BNM; Priv.Coll.

Emanuel (Frank Lewis) 089

Etching and etchings : a guide to technique and to print collecting / by Frank L[ewis] Emanuel ; [preface by W. Russel Flint]. - London [etc] : Pitman, 1930. - XV, [5], 280, [8] p. : front., 237 pl. ; 28 cm.
Contents: p. VII.
List of journals on prints and printmaking: p. XV.
List of some celebrated and interesting painter-etchers: p. 237.
List of materials for etching, with range of current London prices: p. 247.
Suppliers: p. 248.
Plate printers (London): p. 249.
Literature: p. 250.
List of illustrations: p. 253.
Notes to the plates: p. 259.
Index: p. 274.
Advertisement: p. [1] at the back.
Stocklist: p. [6] at the back.
With addenda & corrigenda.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Zinc / Steelfacing
3 –
Counterproof / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Monotype / Photography
5 –
Art History / Collecting
In: BL; BLBS; MET; NUC–1956; OCLC (49×); Priv.Coll. (2×); SBB; UBAB; ULC.

Encyclopädie für Künstler
See: **Praktisches Handbuch** [No. 249].

Enfield (William) 090

NB: see also: **Artist's assistant** (Birmingham 1773) [No. 014]; **Bowles** (London 1760) [No. 045]; **Valuable secrets** (London 1775) [No. 342].

090.1

Elementary view of the fine arts, containing the principles of drawing, painting in general, crayon painting, oil painting, portrait painting, miniature painting, designing, colouring, engraving, &c. &c. / by William Enfield ; assisted by eminent professional gentlemen. - [1st ed.]. - London : printed for T. Tegg, 1809. - 318, [2] p. ; 15 cm.
NOT SEEN
In: NUC–1956.

Young artist's assistant, or elements of the fine arts. Containing the principles of drawing, painting in general, crayon painting, oil painting, portrait painting, miniature painting, designing, colouring, engraving &c. &c. / by William Enfield. - Second ed. - London : printed for Simpkin and Marshall, A.K. Newman and Co., Thomas Tegg, E. Edwards ; Glasgow : Griffin and Co., 1822. - [4], 319, [1] p. : front., [5] pl. ; 18–20 cm.
Contents: p. [3].
MIP: pp. 297–319.
Stocklist: p. [1] backside cover.
§ Printer: Plummer & Brewis.
The bibliography of this publication is unclear. The various copies and catalogues give the 2nd, 3rd, 4th, 5th as well as 6th edition as being published in 1822. *Levis* had a 'second edition' of '1822', now in the V&A Museum; several collections keep a 'fourth edition' of '1822'.
1 –
Aquatint / Crayon Etching / Drypoint / Line Engraving / Mezzotint
2 –
Copper
3 –
Multiple-plate Printing / Printing à la Poupée / Printing Polychrome
4 –
Drawing / Painting
5 –
Aesthetics / Art History
In: BL; *Levis 1912*: 89; NCC; NSTC 2; NUC–1956; Priv.Coll.; UBG.

English academy 091

The English academy. A drawingbook, containing variety of examples of the external parts of men, women, and childrens bodies; with the shapes of several creatures frequently used amongst heralds, gold-smiths, &c. Likewise, the arts of drawing, etching, engraving in copper and wood, painting and limning: all being carefully performed. Wherein the aforesaid arts are exemplified, with plain and easie directions to guide you to their attainment, with much delight. Also the real method how to wash or colour globes, maps, pictures, landskips, flowers, fruits, birds, beasts, fish and fowl. A work worthy acceptation of all those that are friends to art, as, drawers, embroiderers, stone-cutters, carvers, goldsmiths, needle-workers, gum-workers, &c. / performed according to the order of the first and most eminent masters of proportion, viz. P.L., H.G., P.R., H.B. - London : printed by H. Lloyd for for Dixy Page, 1672. - [4], 36 p. : front., 12 engr. ; 19 cm.
MIP: pp. 26–29.
§ *Wing* attributes this work to P.L., though according to the text on the title page P.L is one of the four 'masters of proportion' whose texts are copied.
NLA: "Printed by H. Lloyd for Dixy Page".
P. 34 is numbered '36'.
Title description after microfilm and digital scan.
Intended audience, p. [3]: 'Young Practitioners, for whose Use chiefly this Piece is intended'.
1 –
Line Engraving / Line Etching
2 –
Copper
3 –
Hand-colouring
4 –
Drawing / Painting / Woodcut
5 –
Aesthetics
In: BLO; *Wing 1972–1988*: no. L50.

Erremes (H.) 092

Graveeren en etsen / H. Erremes en R. Mels. - Leuven : Reekmans, [1942]. - 77 p. : 30 pl. ; 21.5 cm. - (Kunsttechnische bibliotheek).
Titles in the series: inside backcover.
§ Title means: Engraving and etching
The 30 plates are 25 reproductions and 5 illustrations.
1 –
Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Cardboard / Copper / Plastic
3 –
Ink / Paper / Press / Printing in Black / Rubbing
4 –
Aesthetics / Art History
In: CCB; CCB 2/2; NUC–1956; PBM; Priv.Coll. (2×); RKD.

Ertzney unnd Kunstneri 093

Ertzney unnd Kunstneri. - […], 1546. - 358 fol.
MIP: Abtrucken. - Fol. 119r.
§ Title means: (A book on) medicine and arts
Manuscript.
Language: German.

Summary recipe for the preparation of an intaglio ink, inking and wiping, before intaglio printing. No details on the printing given, which supposedly is by press, but could also have been performed by rubbing.

3 –

Ink / Printing in Black

In: HAB, Cod. Guelf. 38.14 Aug. 2º, fol. 119r.

Gravure : polymer photogravure, a new method for photographers and graphic artists / Taneli Eskola, Kari Holopainen. - Helsinki : University of Art and Design, 1996. - 132 p. : [56] ill. ; 24 cm.

Glossary: p. 119.

Literature: p. 131.

§ Basically meant for photographers, but eventually became a link in the development of safer printmaking procedures.

The illustrations are diagrams and reproductions.

Continuing on the work by **Ponsaing** (Valby 1995) [No. 245].

2 –

Photopolymer Plate

3 –

Printing in Black

4 –

Photography

5 –

Art History / Health and Safety

In: Priv.Coll.

[Recipe for etching ground]. - [S.l.], [1600–1625]. - [1] p.

§ Manuscript.

Language: Dutch, probably a Flemish dialect.

Manuscript on verso of drawing.

Undated, but perhaps from the early seventeenth century.

Title description after photograph.

Etching is carried out with nitric acid of two strengths, stronger for the foreground, diluted for the background.

1 –

Line Etching

In: FC-CL, 132 DN 08161.

Etstechnieken / onder redactie van Robert Klatser en Jaap Kruijff ; voorwoord R[obert] Klatser. - Amsterdam : Van Dobbenburgh, cop. 1983. - 96 p. : 14, [1], 24, [2], 21, [4], 26, [2], 26, 8, 27, [3], 26, [2], 36, [2], 24, [1], 26, [1], 24, 26, 26, 26, [1], 24, 8, 20, [1] ill. in colour ; 28.5 cm. - (De kunst van het doen).

Contents: p. 5.

Titles in the series: p. 96.

ISBN 90-6577-017-8 (hardcover)

§ Title means: Etching techniques

Originally published as a series of articles in the journal: Taller de las artes. - Madrid : UVE, cop. 1980. The text is completely rewritten. Some of the articles are described in: *Blas Benito*, pp. 80, 88.

The illustrations are photographs and reproductions.

Every technique is illustrated with a series of photographs with captions.

1 –

Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Etching / Mezzotint / Nature Printing / Soft-ground

2 –

Zinc

3 –

Blind Embossment / Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Monochrome / Printing Polychrome / Relief Printing / Viscosity Colour Printing

In: *Blas Benito 1994*: 82; BNM; GBR; KB; NBLC; NCC; OBA; PBM; Priv.Coll.; RKD; UBA.

Radiertechniken / Redaktion Robert Klatser, Jaap Kruijff ; Übersetzung Stichting Tekstverzorging ; deutsche Textbearbeitung Helga Reuter ; Einleitung R[obert] Klatser. - Gogh : NIWA, 1983. - 95, [1] p. : 14, [1], 24, [2], 21, [4], 26, [2], 26, 8, 27, [3], 26, [2], 36, [2], 24, [1], 26, [1], 24, 26, 26, 26, [1], 24, 8, 20, [1] ill. in colour ; 28.5 cm. - (Bild-Kurs-Buch).

Contents: p. 5.

Titles in the series: p. [1].

ISBN 3-88934-007-5 (hardcover)

§ Translation of the edition: Amsterdam 1983.

In: DBI-VK; DNB-L; Priv.Coll.

Etching techniques / ed. Robert Klatser & Jaap Kruijff ; translation The Old Rectory. - Amsterdam ; Kidderminster : Van Dobbenburgh, cop. 1985. - 95 p. : 14, [1], 24, [2], 21, [4], 26, [2], 26, 8, 27, [3], 26, [2], 36, [2], 24, [1], 26, [1], 24, 26, 26, 26, [1], 24, 8, 20, [1] ill. in colour ; 28 cm. - (The art of doing).

Contents: p. 5.

ISBN 9-06-577036-4 [sic!, should be 90-6577-036-4] (softcover)
§ Translation of the edition: Amsterdam 1983.
Distribution: Ruskin Book Services Ltd., Kidderminster.
In: OCLC; Priv.Coll. (2×).

096.4

Iniciación al grabado / [director Joaquín Gómez Burón] ; [redactor Rafael Gómez Rivera]. - Madrid : Génesis, 1992. - 47 p. : [6], 15, [2], 15, [2], 10, [2], 12, [3], 20, [5], 23, [4], 18, [3], 23, 22 colour ill. ; 29 cm. - (Técnicas de pintura y diseño. Técnicas diversas ; 8).
Contents: p. 3.
MIP: pp. 18–47 : front., [2], 12, [3], 20, [5], 23, [4], 18, [3], 23, 22 ill.
Stocklist: backside cover.
ISBN 84-87-809-61-8 [sic!]
§ The series is probably an edited version with fewer illustrations of the series of articles in: Taller de las artes. - Madrid : UVE, cop. 1980.
In: BNM.

096.5

El grabado tradicional / [director Joaquín Gómez Burón] ; [redactor Rafael Gómez Rivera]. - [Madrid] : Génesis, 1992. - 47 p. : colour ill. ; 29 cm. - (Técnicas de pintura y diseño. Técnicas diversas ; 9).
Contents: p. 3.
Stocklist: backside cover.
NOT SEEN
In: BNM.

096.6

Estampaciones especiales / [director Joaquín Gómez Burón] ; [redactor Rafael Gómez Rivera]. - Madrid : Génesis. 1992. - 47 p. : front., [3], 7, [2], 7, [2], 17, [1], 15, [1], [2], 30, [1], 5, [2], 7, [2], 28, [2], 14, [4], 16, [1] ill. in colour ; 29 cm. - (Técnicas de pintura y diseño. Técnicas diversas ; 10).
Contents: p. 3.
MIP: pp. 9–18 : [2], 17, [1], 15, [1] colour ill.
Stocklist: backside cover.
ISBN 84-87-809-49-9 [sic!]
1 –
Photomechanical Etching
2 –
Zinc
3 –
Multiple-plate Printing / Printing Polychrome / Viscosity Colour Printing
4 –
Lithography / Monotype / Screen printing
In: BNM.

Evelyn (John)   097.1

[Notes on mezzotint] / John Evelyn. - [London?], [1661?]. - [2] p. : [4] drawings ; […] cm.
§ Manuscript.
Language: English.
Description of the tools and manner of mezzotint.
Evelyn intended these notes to be kept in the archives of the Royal Society, see: London 1662 [No. 097.2]: 148. Instead they were kept in Christ Church College, Oxford University, as ms. no. 52; from there Evelyn's papers were moved to the British Library in 1995.
Title description based on a reproduction of p. 307, see: **Wax** (New York 1990) [No. 350]: 172.
1 –
Mezzotint
2 –
Copper
In: BL, Evelyn papers, ms. no. 52, pp. 307–308.

097.2

Sculptura: or the history, and art of chalcography and engraving in copper. With an ample enumeration of the most renowned masters, and their works. To which is annexed a new manner of engraving, or mezzo tinto, communicated by his Highness Prince Rupert to the author of this treatise / [John Evelyn] ; J[ohn] E[evelyn] inve. ; A. H[ertochs] scu. ; Prins Ruprecht. - [1st ed.]. - London : printed by J.C. for G. Beedle, and T. Collins, and J. Crook, 1662. - [32], 148, [3] p. : front., vign., [1] engr., [1] mezzotint folding; 16–17 cm.
Contents: p. [19].
Addenda & corrigenda: p. [31].
Literature: p. [32].
MIP: pp. 145–148 ; [1] mezzotint.
§ Title on frontispiece: History of Chalcography by J.E.
The dedication is dated, p. [8]: 'Sayes-Court 5. April 1662. J. Evelyn'.
The engraving of a projection of parallel lines on a curved surface is after: Moyen universel de pratiquer la perspective sur les tableaux ou surfaces irrégulières, ensemble quelques particularites concernant cet art et celui de la graveure en taille douce / Abraham Bosse, Robert Nanteuil. - Paris : Abraham Bosse, 1653. - Pl. 31.
Evelyn is the first to publish information about mezzotint (p. 145) and shows a 'specimen' (his terms, p. 147) of this new printmaking process, although he does not give any instructions. The plate for this, *The Little Executioner*, is prepared differently from the manner in which *The Large Executioner* was prepared. The plate is made by Prins Ruprecht himself and can thus be seen as a specimen of his way of working at that time.
Evelyn attended demonstrations of the mezzotint process on 21 February and 13 March 1661 and made notes and drawings of the technique, which were to be kept in the archives of the Royal Society (p. 148), but he did not want to describe the mezzotint process in this book (pp. 147–148); *Levis 1912*: 29–30; **Wax** (New York 1990) [No. 350]: 21. For the notes see: London 1660–1662 [No. 097.3].

Evelyn presented his 'History of Chalcography', ie the present publication, to the 'Royal Society of London for Improving Natural Knowledge', of which he was a member, on 10 June 1662 [No. 097.3].

Evelyn intended to add his translation of **Bosse** (Paris 1645) [No. 042.2] to the 'History of Chalcography', but refrained from this when he heard that Wiliam Faithorne was preparing to publish a translation of the treatise; see 'Advertisement', p. [1] at the back; *Levis 1912*: 30. Nevertheless Evelyn's translation of the chapter on the construction of the roller press and intaglio printing was read to the Royal Society on 14 May 1662. For Faithorne's translation see: **Bosse** (London 1662) [No. 042.29].

Photomechanical reprint: Oxford 1906 [No. 097.12].

For Evelyn's manuscript translation of the chapter on the construction of the roller press and intaglio printing see: London 1660–1662 (ms.) [No. 097.3]; London 1906 [No. 097.12].

For the part on printing ink only see: London 1726 [No. 097.4].

For Evelyn's manuscript description of the mezzotint process see: London 1660–1662 [No. 097.3].

1 –
Mezzotint
2 –
Copper
5 –
Art History

In: *Bigmore & Wyman 1880–1886* 1: 206–207; BL (4×); *Blas Benito 1994*: 93; BLBS; BM (3×); BN; *Bridson & Wakeman 1984*: no. B5; BS; DBI-VK; *Figueras Ferrer 1992*: 1044; *Hind 1963-1*: 397; *Keynes 1968*: no. 33 (17×); *Levis 1912*: 28–30, 115; MET; NSUG; NUC–1956, vol. 164 (12×); OCLC; *Peddie 1962*, vol. 2; SAH; UBU; ULC (3×); *Wing 1972–1988*: no. E3513 (13×).

<div align="right">097.3</div>

The construction of the rowling press, and manner how to worke off the plates / [transl.] by John Evelyn. - [London?], [c. 1660–1662]. - [15] fol. ; […] cm.
§ Manuscript.
Language: English.
Title according to BL catalogue: 'History of the rowling press for etching'.
Evelyn's translation of the part on intaglio printing after: **Bosse** (Paris 1645) [No. 042.2]: 55–75.
The text was read to the Royal Society on 14 May 1662. *Keynes 1968*: 260–261, note: 'Evelyn made other contributions to the Royal Society's proceedings that were not printed in the *Transactions*. Thus the Register Book of the Royal Society, vol. I, contains: … ii. "The Construction of the Rowling Press and manner how to work off the Plates. By Mr Evelins" (no. 39).'
The part on printing ink was published separately by Hooke in 1726, see the edition: London 1726 [No. 097.4].
The complete text of the ms. was published by Bell in 1906, see the edition: London 1906 [No. 097.12].
Title description after the edition: London 1906 [No. 097.12].
3 –
Ink / Paper / Press / Printing in Black
NOT SEEN
In: BL, Ms. Sloane 243, fol. 127b-141b; *Keynes 1968*: 260–261, no. 124.

<div align="right">097.4</div>

Philosophical experiments and observations of the late eminent Dr. Robert Hooke, S.R.S. And Geom. prof. Gresh. And other eminent virtuoso's in his time / publishe'd by W. Derham. - London : Printed by W. and J. Innys, 1726. - [8], 391, [9] p. ; ill. ; 20 cm.
Addenda & corrigenda: p. [4] at the beginning.
MIP: pp. 188–190.
Index: p. [1] at the back.
Stocklist: p. [7] at the back.
§ *Keynes 1968*: 264, no. 131: '(2) Pp. 188–190. "Ink for the Rolling Press", signed J. Evelyn. Note: These notes were found by Derham among Hooke's papers [see "to the reader", pp. 5–6], and so came to be included here. Evelyn had made a communication to the Royal Society on printing copper-plates (see no. 124, note).' Hooke's text on intaglio printing ink is freely copied after Evelyn's translation after Bosse; **Bosse** (Paris 1645) [No. 042.2]: 66–68; **Evelyn** (Oxford 1906) [No. 097.12] 2: 17–20.
W. and J. Innys were 'Printers to the Royal Society'.
3 –
Ink / Printing in Black
In: BL; UBU.

<div align="right">097.5</div>

Sculptura; or, the history and art of chalcography, and engraving in copper: with an ample enumeration of the most renowned masters and their works. To which is annexed, a new manner of engraving, or mezzotinto, communicated by His Highness Prince Rupert to the author of this treatise / John Evelyn. - The second ed. Containing some corrections and additions taken from the margin of the author's printed copy; an etching of his head, by Mr. [Thomas] Worlidge; an exact copy of the mezzotinto done by Prince Rupert, by Mr. [Richard] Houston; a translation of all the Greek and Latin passages; and memoirs of the author's life. - London : printed for J. Payne, 1755. - [4], xxxvi, 140 p. : front., [1] vign., [1] engr., [1] mezzotint, folding ; 18–19 cm.
Biography of Evelyn: p. iii.
Corrections and additions taken from the margin of the author's printed copy: p. xxxiii.
Addenda & corrigenda: p. xxxvi.
Literature: p. 14.
MIP: pp. 127–129 : 1 mezzotint.
Contents: p. 131.
§ The spelling has been changed, some notes are added, all Greek and Latin quotes are translated and the 'Advertisement' has been omitted.
Keynes 1968: 118: 'The author's own copy was preserved at Wotton (now at Christ Church [College, Oxford, and since 1995 at the British Library]), so that this grandson, Sir John Evelyn, was able to communicate to John Payne, the publisher, the corrections and additions which Evelyn had made in the margins. [Note. I: He also wrote opposite the title page: 'I ever intended a second and much improv'd edition of this Historie.'] Payne was thus enabled to insert these marginalia in his second edition of 1755 (see no. 34). As frontispiece to this edition Worlidge made an etching after the

portrait of Evelyn engraved by Nanteuil in 1650, the mezzotint being copied, as already mentioned, by Richard Houston. The book does not seem to have found a ready sale, and the sheets were three times furnished with a new title-page, being re-issued in 1759 and 1765 by T. Jeffreys, who falsely described the book as 'third edition', and finally in 1769 by the first John Murray, who reverted to the correct description.' The notes have been placed before the text (p. xxxiii) and are not inserted.

The frontispiece is an etching by Worlidge after the engraved portrait by Robert Nanteuil and dated 'Tho. Worlidge Fecit 1753'; see Evelyn's diary for 13 June 1650; see this edition, pp. VI, 87; **Le Comte** (Paris, 1699–1700) [No. 181.1], 1: 220; **Le Comte** (Brusselles 1702) [No. 181.2], 1: 353.

The perspective projection opposite p. 108 has been re-engraved and is in reverse.

The mezzotint plate has been remade by Richard Houston in the mezzotint manner common in the mid-eighteenth century.

In: *Bigmore & Wyman 1880–1886*: 206–207; BL; *Blas Benito 1994*: 93; BLBS; BNM; *Bridson & Wakeman 1984*: no. B5; CCB; DBI-VK; ESTC: no. t113409 (41×); *Hind 1963-1*: 397; *Keynes 1968*: no. 34 (7×); *Levis 1912*: 30–31; MET; NSUG; NUC–1956, vol. 164 (22×); OCLC; RMA; UBU; ULC.

097.6

Sculptura; or, the history and art of chalcography, and engraving in copper: with an ample enumeration of the most renowned masters and their works. To which is annexed, a new manner of engraving, or mezzotinto, communicated by His Highness Prince Rupert to the author of this treatise / John Evelyn. - The third ed. Containing some corrections and additions taken from the margin of the author's printed copy; an etching of his head, by Mr. [Thomas] Worlidge; an exact copy of the mezzotinto done by Prince Rupert, by Mr. [Richard] Houston; a translation of all the Greek and Latin passages; and memoirs of the author's life. - London : printed for T. Jefferys, 1759. - [4], xxxvi, 140 p. : front., [1] vign., [1] engr., [1] mezzotint, folding; 18.5 cm.

Literature: p. 14.
Contents: p. 131.
§ *Keynes 1968*: 122 no. 35: 'The sheets of no. 34 [= London 1755] with a cancel title'.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B5; BS; DBI-VK; ESTC: no. n021296 (5×); *Keynes 1968*: no. 35 (3×); NUC–1956, vol. 164 (3×); OCLC; ULC.

097.7

Sculptura; or, the history and art of chalcography, and engraving in copper: with an ample enumeration of the most renowned masters and their works. To which is annexed, a new manner of engraving, or mezzotinto, communicated by His Highness Prince Rupert to the author of this treatise / John Evelyn. - The third [sic! = 4th] ed. Containing some corrections and additions taken from the margin of the author's printed copy; an etching of his head, by Mr. [Thomas] Worlidge; an exact copy of the mezzotinto done by Prince Rupert, by Mr. [Richard] Houston; a translation of all the Greek and Latin passages; and memoirs of the author's life. - London : printed for T. Jefferys, 1765. - [4], xxxvi, 140 p. : front., [1] vign., [1] engr., [1] mezzotint, folding; 18.5 cm.

Literature: p. 14.
Contents: p. 131.
§ *Keynes 1968*: 122 no. 36: 'The sheets of no. 34 [= London 1755, [No. 097.5]] with a cancel title'.
NOT SEEN
In: *Keynes 1968*: no. 36; ULC.

097.8

Sculptura; or, the history and art of chalcography, and engraving in copper : with an ample enumeration of the most renowned masters and their works. To which is annexed, a new manner of engraving, or mezzotinto, communicated by His Highness Prince Rupert to the author of this treatise / John Evelyn ; [sculp. Thomas Worlidge, Richard Houston]. - The second [sic! = 5th] ed. Containing some corrections and additions taken from the margin of the author's printed copy; an etching of his head, by Mr. [Thomas] Worlidge; an exact copy of the mezzotinto, done by Prince Rupert, by Mr. [Richard] Houston; a translation of all the Greek and Latin passages; and memoirs of the author's life. - London : printed for J. Murray (successor to Mr. Sandby), 1769. - [4], xxxvi, 140 p. : front., [1] engr., [1] mezzotint ; 17.5–18 cm.

Directions to the bookbinder: p. xxxvi.
Addenda & corrigenda: p. xxxvi.
Literature: p. 14.
MIP: pp. 127–129: 1 mezzotint.
Literature: p. 131.
§ Dedication dated, p. [3]: 'March 4, 1755'.
ESTC: 'A reissue of the second edition of 1755, with a cancel titlepage. - Horizontal chain lines.' *Keynes*: 'The sheets of no. 34 [= London 1755] with a cancel title.' The chainlines of the paper of the title page run vertically, the chainlines of the paper of the text run horizontally.

The frontispiece is reworked by drypoint to deepen the shades of cloak and hair, but this impression and that of the 1755 edition seem to be on the same paper. The engravings and mezzotints of both editions seem to be on the same paper.

In: *Bigmore & Wyman 1880–1886*: 206–207; BL; BLBS; BN; *Bridson & Wakeman 1984*: no. B5; ESTC: no. t134297 (20×); KCA; *Keynes 1968*: no. 37 (4×); NUC–1956, vol. 164 (12×); OCLC; RKD; RMA; ULC (2×).

097.9

A escultura, ou a historia, e arte da calcographia, e gravura em cobre / [John] Evelyn ; trad. Ingl. - Lisboa : na Typographia Chalcographica, Typoplastica, e Litteraria do Arco do Cego, [s.a.].

§ Mentioned in the publisher's catalogue as *Debaixo do Prelo* (in press), in **Lairesse** (Lisboa 1801) [No. 177. 14]: [4] at the back. No reference to its actual publication has been found.
NOT PUBLISHED

097.10

The miscellaneous writings of John Evelyn / now first collected, with occasional notes, by William Upcott ; mezzotint by William Say. - London : Henry Colburn, 1825. - XXVI, 849 p. : front., 3 pl. ; 30–31 cm.

Contents: p. XXV.
§ Contains: Sculptura / John Evelyn ; mezzotint by William Say. - P. 243–336 : front., [1] engr., [1] mezzotint.
Keynes 1968, p. 119: 'the mezzotint being copied by William Say. The technique of this plate is very much smoother than that of the earlier versions and it could not be mistaken for them.'
NOT SEEN
In: BL; BDI–VK; *Bridson & Wakeman 1984*: no. B5; *Keynes 1968*: 119; *Levis 1912*: 32; NSTC 2: no. 2E14217; NUC–1956; OCLC.

097.11

The miscellaneous writings of John Evelyn / now first collected, with occasional notes, by William Upcott. - London : Henry Colburn, 1834. - XXVI,

849 p. : front., 3 pl. ; 30–31 cm.
§ Perhaps not published.
NOT SEEN
In: NSTC 2: no. 2E14217.

Evelyn's Sculptura : with the unpublished second part / ed. by C[harles] F[rancis] Bell ; introd. to part II by A.H. Church. - [Oxford] : At the Clarendon Press, 1906. - XXIV, [32], 151, [1], VIII, 32 p. : 8 reprod., [1] photogravure ; 19.5 cm. - (Tudor and Stuart Library).
Contents: p. [17].
Literature: p. [30].
Addenda & corrigenda: p. [31].
MIP: part II, p. 1–32 : 8 reprod.
With literature.
§ Part I is a photomechanical reprint of: London 1662 [No. 097.2]. Added are the 'corrections and additions ... taken from the margin of the author's printed copy' from the edition: London 1755 [No. 097.5]. Part II contains Evelyn's unpublished translation of the chapter on intaglio printing after Bosse, see: London 1660–1662 [No. 097.3].
The six illustrations are reproduced from **Bosse** (Paris 1701) [No. 042.6]: pl. 11–16. *The Small Executioner* is reproduced in photogravure after the plate: London 1662 [No. 097.2].
1 –
Mezzotint
2 –
Copper
3 –
Counterproof / Ink / Multiple-plate Printing / Press / Printing in Black / Printing Monochrome / Printing Polychrome
4 –
Monotype
In: BL; *Blas Benito 1994*: 93; *Bridson & Wakeman 1984*: nos. B5, B68; CCB; DBI-VK; *Hind 1963-1*: 397; KB; *Keynes 1968*: no. 38; *Levis 1912*: 31; NUC–1956, vol. 164 (15×); OCLC; RMA; SBB; UBL; UBU; ULC (3×).

Excellency

The excellency of the pen and pencil, exemplifying the uses of them in the most exquisite and mysterious arts of drawing, etching, engraving, limning, painting in oyl, washing of maps & pictures. Also the way to cleanse any old painting, and preserve the colours / collected from the writings of the ablest masters both antient and modern, as Albert Durer, P. Lomantius, and divers others. - [1st ed.]. - London : for Dorman Newman and Richard Jones, 1668. - [16], 1–48, 45–121 p. : front., [20] engr. ; 16 cm.
Contents: p. [7].
Stocklist: p. [14].
MIP: pp. 48–63 : [1] engr.
§ Pages 45–48 are numbered twice, but the text is continuous. This is found in the contents indicating that the contents were compiled after the printing of the text.
Excellency: 57–61 are copied almost literally after Faithorne (**Bosse** (London 1662) [No. 042.29]): 43–48.
The composition of the frontispiece of **Salmon** (London 1672) [No. 284] is partly copied in reverse after the frontispiece of Excellency; see also *Levis 1912*: 33, suppl. p. 9.
The engraving on p. 56 has no page number, the recto side is numbered '55'. The engraving on p. [56] is after Faithorne (**Bosse** (London 1662) [No. 042.29]. Fig. 1, 2, 5 and 6 are on Faithorne's pl. 10, fig. 3 and 4 are Fig. III and IIII on Faithorne's pl. 9.
On the title page: A work usefull for all gentlemen, and other ingenious spirits, either artificers or others
Does not contain any information on mezzotint yet; see the second edition.
See also: **Sanderson** (William) [No. 287].
1 –
Line Engraving / Line Etching
2 –
Copper
3 –
Hand-colouring
4 –
Architecture / Drawing / Painting
In: BL (2×, 'the second one imperfect, coming from BLBS'); MFA; NUC–1956 (plus one more copy (under Evelyn (John)); *Wing 1972–1988*: no. E 3779 (11×).

The excellency of the pen and pencil / Johan. Gurdon scripsit & picturas delineavit. - [S.l.], 1670. - 110 p. : ill. ; 16 cm.
§ Manuscript.
Language: English.
Bound together with a manuscript copy of chapter 3 of Bate's treatise, see also: **Bate** (London 1673) [No. 024.5].
Title description after NUC.
NOT SEEN
In: LC-RC, ms. no. 20; NUC–1956.

The excellency of the pen and pencil, exemplifying the uses of them in the most exquisite and mysterious arts of drawing, etching, engraving, limning, painting in oyl, washing of maps & pictures. Also the way to cleanse any old painting, and preserve the colours / collected from the writings of the ablest masters both ancient and modern, as Albrecht Durer, P. Lomantius and divers others. - [2nd ed.]. - London : printed for Dorman Newman, 1688. - [14], 1–61, 78–91, 76–123 p. : front., [21] engr. ; 15.5 cm.
Contents: p. [7].

MIP: pp. 48–61, 78/I–81/I : [2] engr.

§ The frontispiece is the same as the first edition, the title page is adapted.

The introduction in this edition is identical to that in the first edition and the additions are not mentioned.

The numbering of the pages is interrupted between pp. 61 and 78, and repeated from pp. 76 to 91 (here indicated with Roman numerals I and II), but the text is continuous. This is found in the contents indicating that the contents were compiled after the printing of the text.

The engraving on p. 56 has no page number, the recto side is numbered '55' as in the first edition. The new engraving accompanying p. 80/I ('to front pa. 80. lib. 2.') is the first printed depiction of tools for mezzotint.

1 –

Line Engraving / Line Etching / Mezzotint

2 –

Copper

3 –

Print behind Glass

In: BL; BLBS; CCB; *Levis 1912*: 32–36; MET; NUC–1956; OCLC; RMA; ULC; *Wing 1972–1988*: no. E 3779A (8×).

F

Faithorne (William)

See: **Bosse** (Abraham) [No. 042.29].

Felsing (O.) 099

Verfahren zur Herstellung von Farben-Teilplatten für Mehrfarbendruck von Walter Ziegler, München. D.R.P. 127 254 und patent[iert] in verschiedenen Ländern. Speziell für Kupferdruk (Originalradierung etc.) beschrieben / [O. Felsing] ; [etch. in colour by Hans am Ende]. - Berlin : Hofkupferdruckerei Felsing, [c. 1920]. - 12 p. : [1] etch. in colour ; 24.5 cm.

Supplier: p. 3.

Printshop: p. 6.

§ Title means: Multiple-plate colour printing process by Walter Ziegler, München. German State Patent 127,254 and patented in several countries. Instructed especially for intaglio printing (original etching etc.)

See also: **Ziegler** (Halle an der Saale 1901) [No. 367].

'D.R.P.' means *Deutsches Reichspatent*.

1 –

Soft-ground

2 –

Copper

3 –

Multiple-plate Printing / Printing Polychrome

In: ABK, G a 14.

Ferrer (Eva Figueras)

See: **Figueras Ferrer** (Eva) [No. 101].

Fick (Bill)

See: **Grabowski** (Beth) & **Fick** (Bill) [No. 126].

Fielding (Theodore Henry Adolphus) 100.1

The art of engraving : with the various modes of operation, under the following different visions: etching, soft-ground etching, line engraving, chalk and stipple, aquatint, mezzotint, lithography, wood engraving, electrography and photography / by T[heodore] H[enry] A[dolphus] Fielding. - [1st ed.]. - London : Ackermann, 1841. - VIII, 109, [3], 14 p. : 10 pl., [8] woodengr. ; 25.5–26 cm.

Contents: p. V.

Supplier of nitric acid: p. 22.

'List of requisites for engravers': p. [1].

List of other publications by Fielding: p. [1].

List of prints of contemporaneous engravers: p. [2].

Stocklist: p. 10 at the back.

Ackermann's materials and presses for lithography: p. 13 at the back.

Stationery: p. 13 at the back.

With literature.

§ The first monograph containing a chapter with instructions for photography (pp. 101–109).

All processes described are illustrated with specimens, except electrotype and photography. The plates are numbered: I, II, III, IV, V, VI, [ ], [ ], 9, 10.

Ackermann's cataloque (p. 1–14 at the back) is not bound with every copy.

1 –

Aquatint / Crayon Engraving / Drypoint / Electrotype / Line Engraving / Line Etching / Mezzotint / Ruling Machine / Stipple Engraving / Soft-ground

2 –

Copper / Glass / Steel

4 –

In: BL; BLBS; CCB; DBI-VK; *Levis 1912*: 102, 121, 164; MET; NSTC 2: no. 2F5610; NUC–1956; OCLC; Priv.Coll.; RAL; RMA; *Singer & Strang 1897*: no. 170; ULC.

100.2

The art of engraving : with the various modes of operation, under the following different visions: etching, soft-ground etching, line engraving, chalk and stipple, aquatint, mezzotint, lithography, wood engraving, electrography and photography / by T[heodore] H[enry] A[dolphus] Fielding. - [2nd ed.]. - London : Nattali, 1844. - VIII, 109, [3] p. : 10 pl., [8] woodengr. ; 25–26 cm.
Contents: p. V.
Supplier of nitric acid: p. 22.
With literature.
'List of requisites for engravers': p. [1].
List of other publications by Fielding: p. [1].
List of prints of contemporaneous engravers: p. [2].
§ Some bibliographies mention an edition published in 18<u>8</u>4, but this is erroneous for 18<u>4</u>4.
In: *Blas Benito 1994*: 68; BNP; CCB; DBI-VK; *Figueras Ferrer 1992*: 1045; KCA; *Levis 1912*: 121, 164; MET; NG; NSTC 2: no. 2F5610; NUC–1956; OCLC; Priv.Coll. (2×); *Singer & Strang 1897*: no. 186; UBA.

100.3

The print collector, an introduction to the knowledge necessary for forming a collection of ancient prints. Containing suggestions as to the mode of commencing collector, the selection of specimens, the prices and care of prints. Also notices of the marks of proprietorship used by collectors, remarks on the ancient and modern practice of the art and a catalogue raisonné of books on engraving and prints / [Joseph Maberly] ; [woodengr. by S. Williams and W. Boxall] ; [pl. by E.M.]. - London : Saunders and Otley, 1844. - VIII, 211 p. : 4 woodengr., 3 pl. ; 22.5 cm.
Contents: p. V.
Literature: p. 177.
§ Without instructions on intaglio printmaking techniques. These only appeared when Fielding's text was added, see: New York 1880 [No. 100.4].
This is one of the first publications on prints with a literature list that also contained practical manuals on intaglio printmaking.
In: BL; BN; DBI-VK; *Hind 1963-1*: 399; *Levis 1910*: 57–58; *Levis 1912*: 41–43, 48–49; MMR; NCC; NUC–1956; OCLC; NSTC 2: no. 2M730; NUC–1956 (6×); RMA; ULC.

100.4

The print collector : an introduction to the knowledge necessary for forming a collection of ancient prints / Joseph Maberly. With an appendix containing Fielding's treatise on the practice of engraving / ed. with notes, an account of contemporary etching and etchers, and a bibliography of engraving by Robert Hoe, Jr. - [2nd ed.]. - New York : Dodd, Mead, 1880. - VIII, 350 p. : front., 9 pl. ; 24 & 28 cm.
MIP: Appendix. Treating of the practice of the art of engraving, with the various modes of operation, under the following different divisions, viz.: Etching, Soft-ground Etching, Line Engraving, Aquatint, Mezzotint, Chalk and Stipple, Wood Engraving, and Lithography. - Pp. 201–258 : 1 pl.
Contemporary etchings and engravings: p. 259.
Catalogue of Dürer's engravings on copper and etchings: p. 287.
Catalogue of Dürer's wood engravings: p. 293.
Table of the whole etched work of Rembrandt: p. 297.
Literature: p. 311.
§ Contains the text of Fielding's manual, without the chapter on photography and including the plate with the tools only.
The normal trade edition is 24 cm high, large paper copies are 28 cm high.
Announcement: *American Art Review* (1880) 4: 171.
Review: *American Art Review* (1880) 8: 79–80. The reviewer, Sylvester Rosa Koehler (see: **Lalanne** (London 1880) [No. 178.12 and **Koehler** (New York 1885) [No. 168]) is confident about the addition of a text on printmaking techniques, but considers Fielding's text to be inaccurate, especially concerning soft-ground, 'the misprints … are inexcusable'.
Title description after: New York 1979 [No. 100.8].
NOT SEEN
In: BL; *Hind 1963-1*: 399; *Levis 1910*: 57–58; *Levis 1912*: 71, 102, 164; NUC–1956; OCLC; *Singer & Strang 1897*: no. 289.

100.5

The print collector : an introduction to the knowledge necessary for forming a collection of ancient prints / Joseph Maberly. With an appendix containing Fielding's treatise on the practice of engraving / ed. with notes, an account of contemporary etching and etchers, and a bibliography of engraving by Robert Hoe, Jr. - [3rd ed.]. - New York : Dodd, Mead, 1881. - 3 pts. [VIII, 336 p.] : ill. ; 24–25 cm.
Literature: p. 331.
§ This is the edition New York 1880 [No. 100.4] including an extra part with 'fine prints'.
NOT SEEN
In: NUC–1956 (2×); OCLC.

100.6

The print collector : an introduction to the knowledge necessary for forming a collection of ancient prints / Joseph Maberly. With an appendix containing Fielding's treatise on the practice of engraving / ed. with notes, an account of contemporary etching and etchers, and a bibliography of engraving by Robert Hoe, Jr. - [4th ed.]. - New York : Dodd, Mead, 1885. - VIII, 322 p. : front., ill., 5 pl. ; 23–24 cm.
NOT SEEN
In: NUC–1956 (5×); OCLC.

100.7

The print collector : an introduction to the knowledge necessary for forming a collection of ancient prints / Joseph Maberly. With an appendix containing Fielding's treatise on the practice of engraving / ed. with notes, an account of contemporary etching and etchers, and a bibliography of engraving by Robert Hoe, Jr. - [4th ed.]. - New York : Frederick Keppel, 1885. - VIII, 322 p. : front., ill., 5 pl. ; 23–24 cm.
NOT SEEN
In: OCLC.

The print collector : an introduction to the knowledge necessary for forming a collection of ancient prints / Joseph Maberly. With an appendix containing Fielding's treatise on the practice of engraving / ed. with notes, an account of contemporary etching and etchers, and a bibliography of engraving by Robert Hoe, Jr. - Repr. - New York [etc.] : Garland, 1979. - 309 p. : 8º. - (A dealers' and collectors' Bookshelf. Prints and drawings).
ISBN 0-8240-3331-0
§ Photomechanical reprint of: New York 1880 [No. 100.4].
In: OCLC; UBH.

Figueras Ferrer (Eva)   101
El grabado no tóxico : nuevos procedimientos y materiales / Eva Figueras Ferrer (ed.) ; [with contributions by Cedric Green, Keith Howard en Friedhard Kiekeben, Juan Carlos Ramos, and Rosa Vives]. - Barcelona : Publicacions i Edicions de la Universitat de Barcelona, 2004. - 206 p. : ill. ; 26 cm.
ISBN 84-475-2810-3
§ Title means: Non-toxic engraving: new processes and materials
Green (Cedric; Sheffield 1999) [No. 128] is largely translated and incorporated in this volume.
See also: **Figueras Ferrer** (2008) [No. 441].
1 –
Line Etching
2 –
Copper / Polymer Film
NOT SEEN

Filleau des Billettes (Gilles)   102
[Fragments of the 'Description des arts et métiers' related to letterpress printing and engraving] / Gilles Filleau des Billettes ; [pl. by Louis Simonneau]. - [Paris?], [1693–1698]. - [...] p. : [...] drawings, [4] pl. ; [...] cm.
MIP: pp. 121–165 : [2] drawings, [4] pl.
§ Manuscript.
Language: French.
Part of the initial notes for the 'Description des arts et métiers' (Paris 1761–1789) compiled by members of the Académie des Sciences between 1693 and 1698. Although intended to be published, this was effectuated only during the publication of the 'Encyclopédie' by Diderot & D'Alembert, when the original texts were completely revised and new plates prepared. Not all manuscripts were published, such as this one.
The manuscript is written in 1693, p. 110: 'en cette année 1693 on en a trouvé une mine [pour cuivre] dans les Pyrenées'.
The diagrams are drawn in the margins of the text.
The plates are etchings added to the manuscript. The second state of the plate with the interior of an engraver's studio is dated '1696'. The plate with the interior of a printshop with a wooden press is dated '1697'. There are no references from the text to the plates or vice versa. The layout of the original plates, with a workshop interior in the upper part and a display of the tools below this, became the standard for other similar productions.
The text is not instructive, but is included in the present bibliography because the author must have been well informed given the amount of technical details, many of which were not published before or later.
The manuscript is mentioned by Chomel; *Chomel 1778*, 2: 1684.
Title description after partial photocopy.
1 –
Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Counterproof / Monochrome Printing / Multiple-plate Printing / Printing in Black / Printing Polychrome
4 –
Chiaroscuro Woodcut / Woodcut
In: NLC, Case Wing Ms. Z 4029.225.

Fishpool (Megan)   103
Hybrid Prints : to infinity and beyond! / Megan Fishpool. - London : A&C Black, 2009. - 144 p. : colour ill. ; 23.5 cm.
ISBN 978-0-7136-8650-0 (softcover)
§ Announcement: *Printmaking Today*, 18 (2009) 3: 34.
1 –
Collagraph / Line Etching
4 –
Digital Printmaking / Monotype
NOT SEEN
In: COPAC.

Fitzsimmonds (Bernard)
See: **Hacking** (Nicholas) [No. 132].

Flocon (Albert)   104.1
Traité de burin / Albert Flocon ; préface Gaston Bachelard ; [engr. by Albert Flocon]. - [1st ed.]. - Paris : Blaizot, 1952. - 111 p. : front., [32] engr. ; 23 cm.
Contents: p. 111.
Edition: 260 copies numbered 1–250 and A–K.
§ Title means: A treatise on burin (engraving)

Unbound quires in cassette.
With twenty copies printed on Japanese paper. The final ten copies (nos. A–K) are a series of experimental engravings with accompanying texts.
Photomechanical reprint: Paris 1982.
1 –
Line Engraving
2 –
Copper
3 –
Printing in Black
5 –
Aesthetics
In: *Bachelard 1991*: 93–106; *Blas Benito 1994*: 79; BNP; CCB; NCC; NUC–1956; OCLC; UBA.

104.2

Traité de burin / Albert Flocon ; préface Gaston Bachelard ; [engr. by Albert Flocon]. - [2nd ed.]. - Genève : Cailler, 1954. - 107, [4] p. : front., [32] reprod. ; 18.5 cm. - (Peintres et sculpteurs d'hier et d'aujourd'hui ; 30).
Contents: p. [2].
Stocklist: backside cover.
Edition: the first 120 copies are numbered CH 1 –
CH 120.
§ This is the trade edition reproducing the engravings of the first edition.
In: *Blas Benito 1994*: 79; *Figueras Ferrer 1992*: 1045; NUC–1956; Priv.Coll.; RKD.

104.3

Traité de burin / Albert Flocon ; préface Gaston Bachelard ; [engr. by Albert Flocon]. - Reéd., augm. [3rd ed.]. - Paris : Clancier-Guénaud, 1982. - 139, [3] p. : ill. ; 21.5 cm. - (Bibliothèque des signes).
'Trente ans après': p. 113.
Literature: p. 135.
Manuscripts and publications by Flocon: p. 137.
Contents: p. [2].
Titles in the series: p. [3].
Edition: trade edition and 106 copies numbered 1–80 and A–Z.
ISBN 2-86215-026-6 (softcover)
§ Photomechanical reprint of: Paris 1952. With the extra chapter 'Trente ans après'.
The 106 *hors commerce* copies contain an extra engraving.
Review: M. P[réaud], 'Réédition du Traité du Burin d'A. Flocon', in *Nouvelles de l'Estampe* (1983) 67: 43.
In: BL; *Blas Benito 1994*: 79; OCLC; Priv.Coll.

104.4

Traktat über den Kupferstich / Albert Flocon ; Vorwort von Gaston Bachelard ; Übersetzer Gerhard von Haberbosch. - Vorzugsausg. - Berlin : Laser (Verlag Vis-à-Vis), 1986. - 128 p. : 111 ill., 1 engr. ; 22 cm.
ISBN 3-924040-20-6
§ Although the number of illustrations is given as '111', probably all smaller figures on one plate are counted separately.
NOT SEEN

104.5

Traktat über den Kupferstich / Albert Flocon ; Vorw. von Gaston Bachelard ; Übers. Gerhard von Haberbosch. - Berlin : Laser (Verlag Vis-à-Vis), 1986. - 128 p. : 111 ill. ; 22 cm.
ISBN 3-924949-19-2
§ Although this edition was planned for 1986 it was never published; letter from the publisher.
NOT PUBLISHED

Fokke 1 Simonsz. (Arend)   105

De graveur, behelzende eene beknopte handleiding tot de daktylioglyphia, of graveerkunst in edele gesteenten. Het stempelsnijden. Het graveeren in hout en koper. Het etsen. Het graveeren in zwarte kunst, of in mezzo tinto. Het hamerwerk. Het graveeren in de manier van craijon en om met couleuren te drukken, en eindelijk het pointeeren en graveeren in acqua tinta. Benevens de beschrijving en afbeelding der werktuigen tot deze kunsten gebezigd wordende / uit de nieuwste uitlandsche schrijveren, en volgends de inlichtingen der beste hedendaagsche meesters in deze kunsten [zijnde E.T. Verrooten, Jan Oortman, Noach van der Meer jr., Lambertus Antonius Claessens en Ludwig Gottlieb Portmann], samengesteld door Arend Fokke, Simonsz. ; [woodcut by Jan] Oortman. - Dordrecht : bij A[braham] Blussé en Zoon, 1796. - [1], XII, 359, [9] p. : X pl., [1] woodcut ; 21–21.5 & 22–22.5 cm. - (Volledige beschrijving van alle konsten, ambachten, handwerken, fabrieken, trafieken, derzelver werkhuizen, gereedschappen, enz. Ten deele overgenomen uit de beroemdste buitenlandsche werken; en vermeerderd met de theorie en praktijk der beste inlandsche konstenaaren en handwerkslieden; dertiende stuk. De graveur).
List of titles in the series: p. [1].
MIP: pp. 139–359 : pl. VI–X.
Contents: p. [1] at the back.
Directions to the bookbinder: p. [6].
Stocklist: p. [7] at the back.
Specimens: pl. IX, fig. 9; pl. X, fig. 11–15.
With literature.
§ Title means: The engraver, containing a short treatise on dactylioglyphy, or the art of cutting gems. The cutting of dies. The engraving in wood and copper. The etching. The engraving in black art, or in mezzo tinto. The hammerwork. The engraving in crayon manner and to print with colour, and finally dotting and engraving in aquatint. As well as the description and depiction of the tools used for these arts
The copies on *Ordinair papier* are 21–21.5 cm high and those on *Best papier* are 22–22.5 cm high.
Fokke derived his information from several publications. For example, **Schwegman 1** (Haarlem 1793) [No. 301] is referred to on p. 292 ff; **Bylaert**

(Leiden 1772) [No. 056] on p. 296 ff; **Bosse** (Amsterdam 1662) [No. 042.26] is quoted on pp. 258–259 for recipes for etching grounds by Pieter Nolpe and others.

The plates are copied and adapted in reverse after the plates accompanying the 'Encyclopédie' (= *Diderot & d'Alembert 1751–1780*) or are after a later edition with plates copied in reverse of the first edition of the Encyclopédie. References to the first edition of the plates are as follows: Receuil de planches sur les sciences, les arts libéraux, et les arts méchaniques, avec leur explication, quatrieme livraison [= vol. 5], Paris: Briasson, David, Le Breton, 1767. Fokke, Pl. VI = Encyclopédie, pl. I; Fokke, pl. VII = Encyclopédie, suite de pl. I, pl. II, IV, V; Fokke, pl. VIII = Encyclopédie, suite de pl. I, pl. II, III, V; Fokke, pl. IX= Encyclopédie, pl. VII; Fokke, pl. X= Encyclopédie, pl. VIII. Fokke, pl. IX, fig. 9 is a specimen of mezzotint. Fokke, pl. X, fig. 11–15 are specimens of crayon engraving.

Intended audience, pp. ix–x, xi–xii: 'Kunstoefenaar en Kunstliefhebber', 'jonge kunstenaars in de zo noodige Graveerkunst'.

Review: *Magasin encyclopédique, ou journal des sciences des lettres et des arts*, 2 (An V [= 1797]) 6: 567–568.

1 –
Aquatint / Crayon Etching / Échoppe / Line Engraving / Line Etching / Mezzotint / Stipple Engraving
2 –
Copper
3 –
Gem Cutting / Stamping / Woodcut
5 –
Art History
In: CCB; DBI-VK; GBR; GLA; GMPL; KB; KUB; MBvB; NCC; NGZK; NSUG; NUC–1956; OCLC; Priv.Coll.; RKD; RMA; TUD; UBA; UBG; UBL; UBL-KHI; UBN; UBU; VU.

Fokke 2 Simonsz. (Arend) 106.1

De kunst van tekenen en schilderen in waterverwen, waarin de beginselen der tekenkunst op eene natuurlijke en gemakkelijke wijze worden opgegeeven, en de jeugd in alles wat betrekking tot deze nuttige kunst heeft, volgends het gebruik der beste meesters, onderricht wordt. Waarbij gevoegd zijn gemakkelijke handelwijzen, waardoor een onkundige in de tekenkunst spoedig bekwaam kan worden, om een gezicht of landschap, met de meeste naauwkeurigheid afteteekenen; als ook om afdrukken van medailles enz. te maken, met eene groote verscheidenheid van manieren daar toe, welken te vooren nooit publiek gemaakt zijn; doormengd met nuttige voorschriften, ten gebruike van schilders, beeldhouwers, gieters enz. als mede onderrichtingen, tot de bereiding, menging en behandeling van alle soorten van waterverwen / na den achtsten druk uit het Engelsch vertaald [by Arend Fokke Simonsz.]. - In Den Hage : bij J.C. Leeuwestijn, [1803]. - [1st ed.] . - 2 vol. in 1 bd. : [2] folding pl. ; 18.5–19 cm.
Contents: p. [1] at the back.
§ Title means: The art of drawing and painting in watercolours (etc.)
Den Hage is 's-Gravenhage.
According to the title, the text is translated from the English without giving a title. There is some relationship between **Bowles** (seen London 1788) [No. 045.12] and **Fokke 2**, but Fokke's text is not a straight copy.
– Vol. 1: De gronden der tekenkunst: p. 1–77
– Vol. 2: De leer der waterverwen, om prenten, enz. op de beste wijze aftezetten of te kleuren: pp. 78–133
MIP: pp. 64–77.
2 –
Copper
3 –
Casting
4 –
Nature Printing
In: CCB; NCC; RMA; UBN.

106.2

De kunst van tekenen en schilderen in waterverwen, waarin de beginselen der tekenkunst op eene natuurlijke en gemakkelijke wijze worden opgegeeven, en de jeugd in alles wat betrekking tot deze nuttige kunst heeft, volgends het gebruik der beste meesters, onderricht wordt. Waarbij gevoegd zijn gemakkelijke handelwijzen, waardoor een onkundige in de tekenkunst spoedig bekwaam kan worden, om een gezicht of landschap, met de meeste naauwkeurigheid afteteekenen; als ook om afdrukken van medailles enz. te maken, met eene groote verscheidenheid van manieren daar toe, welken te vooren nooit publiek gemaakt zijn; doormengd met nuttige voorschriften, ten gebruike van schilders, beeldhouwers, gieters enz. als mede onderrichtingen, tot de bereiding, menging en behandeling van alle soorten van waterverwen / na den achtsten druk uit het Engelsch vertaald [door Arend Fokke Simonsz.]. - Leyden : bij A. en J. Honkoop, 1804. - [2nd ed.]. - 2 vol. in 1 bd. : 2 folding pl. ; 19 cm.
§ Re-edition using a remainder of the first edition with a new title page pasted to it.
– Vol. 1: De gronden der tekenkunst. - P. 1–77.
– Vol. 2: De leer der waterverwen, om prenten, enz. op de beste wijze aftezetten of te kleuren. - P. 78–133, [1–7] : [2] pl.
MIP: pp. 64–77.
Contents: p. [1].
In: CCB; KB; NCC; UBG; UBL; KHI.

Fokke 3 Simonsz. (Arend) 107

De kunst om in perspectief te tekenen, waarin de leer der perspectief, of doorzichtkunde, klaar en beknoptelijk, op meetkundige gronden, behandeld wordt; benevens eene werktuigkundige wijze, om in perspectief te tekenen, uitgevonden ten behoeve van hen, welken in de wiskunst onervaaren zijn. Bij het welke gevoegd is de kunsten om op glas te schilderen, en met craijons, of drooge verwen, te tekenen; gelijk ook regelen, om craijons op de Fransche en Italiaansche wijze te vervaardigen. Benevens de kunst van op koper te etsen, en die, om op de Japansche wijze, hout en allerleije metaal te verlakken, om Chineesch werk natebootsen; met onderrichtingen tot het maaken van zwarte of geele Japansche waaren, beide schoon en helder; en om de hardste en doorschijnendste vernis te maaken. Waarbij nog gevoegd is. Eene wijze om amber in allerlei vormen te gieten / naar den zesden druk uit het Engelsch vertaald [door Arend Fokke Sz.]. - Leyden : bij A. en J. Honkoop, 1805. - VIII, 100 p. : [1] folding pl. ; 16.5–18.5 cm.
Contents: p. V.
§ Title means: The art of drawing in perspective (etc.)

The text relates to typical English texts, such as the recipes for red, white and black etching grounds (p. 64), but no definite source could be given.
– Vol. 1: De beginselen der perspectief. - P. 1–33.
– Vol. 2: De kunst van schilderen op glas ... [etc.]. - P. 34–100.
MIP: pp. 61–76.
1 –
Échoppe / Line Etching
2 –
Copper
3 –
Hand-colouring
In: CCB; KB; RMA; UBG; UBL-KHI.

Fraipont (Gustave) 108.1

L'art d'appliquer ses connaissances en dessin. Fusain, crayon, plume, eau-forte, lithographie, exécution des dessins pour la photogravure et la gravure sur bois, l'art de prendre un croquis / par G[ustave] Fraipont ; dessins inédits de l'auteur [Gustave Fraipont]. - Paris : H. Laurens, [dépôt légal 1897]. - [3] p., 6 pts. in 1 bd., [3] p. : fig. ; 22–22.5 cm.
List of works by the author: p. [2] at the beginning.
Advertisement: p. [2] at the beginning.
MIP: L'eau-forte et la lithographie. - Pt. 4, p. 3–42 : fig. 1–28.
Contents: after every part.
Contents for pt. 4: pt. 4, pp. 87–88.
Stocklist: p. [2] at the back.
With literature.
§ Title means: The art of applying one's knowledge in drawing. Charcoal, crayon, pen, etching, lithography, preparing drawings for photogravure and wood engraving, the art of sketching
Title on cover: L'art d'utiliser ses connaissances en dessin : fusain, crayon, plume, eau-forte, lithographie, gravure, photogravure, croquis / texte et dessins de G. Fraipont
Collation: [3], 74, [2], 67, [1], 65, [3], 88, II, 65, [1] p., p. VII–VIII, 80, [4] p. Texts are on numbered pages, contents on unnumbered pages.
The *figures* are diagrams and reproductions.
Aimed at amateurs and beginners: Pt. 4, p. [1].
1 –
Drypoint / Line Engraving / Line Etching
2 –
Copper
3 –
Printing in Black
4 –
Drawing / Line Block / Lithography / Wood Engraving
In: BN.

108.2

Eau-forte, pointe-sèche, burin, lithographie : les procédés de reproduction en creux et la lithographie : ouvrage accompagné de 50 dessins techniques et explicatifs de l'auteur / G[ustave] Fraipont. - Paris : Laurens, [1901]. - [4], 88 p. : 52 fig. ; 23 cm.
Stocklist: p. [2], backside cover.
MIP: pp. 3–42 : fig. 1–28.
Contents: p. 87.
§ Title means: Etching, drypoint, engraving, lithography: the intaglio reproduction techniques and lithography: a work accompanied by fifty technical and explanatory drawings by the author
Independent, almost identical edition of the part on engraving, etching and lithography.
1 –
Drypoint / Line Engraving / Line Etching
2 –
Copper
3 –
Printing in Black
4 –
Lithography
In: BL; BLBS; BN; IBK 1978, 1 (1902): no. 3560; Priv.Coll. (inc.).

Fricke (Johann) 109

Grafische Drucktechniken als Hobby. Vom Holzschnitt zum Siebdruck / von Johann Fricke. - Köln : Verlagsgesellschaft Schulfernsehen [= VGS], 1984. -149, [6] p. : [261] ill., of which [140] in colour ; 20.5 × 21.5 cm.
Contents: p. 5.
MIP: pp. 32–71 : [93] ill., of which [47] in colour.
Suppliers: p. 147.
Literature: p. 149.
Advertisement: p. [1].
Stocklist: p. [5].
ISBN 3-8025-6140-6 (hardcover)
§ Based on television broadcasting, p. 4: 'Die fünf Folgen der Fernsehreihe "Graphische Drucktechniken", auf der dieses Buch basiert, wurden im Frühjahr 1982 in der Staatlichen Kunstakademie Düsseldorf gedreht. Die Aufnahmen zu diesem Begleitbuch entstanden während der Dreharbeiten.'

The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Drypoint / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Brass / Cardboard / Copper / Plastic / Steelfacing / Zinc
3 –
Blind Embossment / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing Polychrome / Relief Printing
5 –
Art History
In: DNB-F; DBI-VK; DNB-L; Priv.Coll. (2×).

Fuchs (Siegfried E.)   110

Der Kupferdruck. Vom Kupferstich bis zur Radierung. Ein technischer Leitfaden für Künstler und Sammler / Siegfried E. Fuchs. - Recklinghausen : Aurel Bongers, cop. 1978. - 115, [1] p. : 72 Abb., of which [5] in colour ; 25–25.5 cm.
Contents: p. 5.
Glossary: p. 102.
Literature: p. [1].
Stocklist: inside front and back flap.
ISBN 3-7647-0311-3 (hardcover)
§ Title means: Intaglio printmaking. From engraving to etching. A technical manual for artists and collectors
The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Iron / Copper / Zinc
3 –
Blind Embossment / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Conservation and Restoration
In: DNB-F; DBI-VK; DNB-L; KSM; KUB; MMW; NCC; NSUG; OBA; OCLC; Priv.Coll. (2×); RAA (2×); UBA (2×); UBAB; UBH (2×); UBN.

G

G.A.B.
See: **Banner** (G.A.) [No. 021].

G.H. 111

Neu vollständiger Reiß-Buch, mit vielen schönen Anweisungen zum Zeichnen, Perspectiv, Kupfferätzen und Sonnen-Uhren, der kunst-liebenden Jugend absonderlich zum besten aufs neu zusammen getragen, und mit einer Vorred oder nutzlichen Unterricht versehen / von einem dieser preiß-würdigen Kunst eyfrigst-ergebenen G.H. - Nürnberg : Verlegts Johann Leonhard Buggel, 1707 [= 1707–1709]. - [8] p. : front., 62 Fig. ; 19.5 × 31.5 cm.
MIP: pp. [5]–[7].
§ Title means: New complete drawing book, with many pretty explanations for drawing, perspective, etching and (making) sundials (etc.)
Title on frontispiece: Neu-vollständiger Reißbuch mit vielen schönen Anweisungen in diesen und andern Wissenschafften. Nürnberg Verlag J.L. Buggel
Introductory text with 62 etched examples.
Intended audience, title page: 'der kunst-liebenden Jugend absonderlich zum besten aufs neu zusammen getragen'.
1 –
Line Engraving / Line Etching
2 –
Copper
3 –
Drawing
In: HAUM; WLS.

Gaal de Waye (J.C.)
See: **Bosse** (Abraham) [No. 042.10].

Gabriel (Maria)
See: **Jorge** (Alice) & **Gabriel** (Maria) [No. 162].

Gale (Colin)
See: **Petterson** (Melvyn) & **Gale** (Colin) [No. 238].

Gale 1 (Colin)   112

Etching and photopolymer intaglio techniques / Colin Gale. - London : A&C Black, 2006. - 144 p. : 100 fig. ; 23.5 cm. - (Printmaking Handbooks).
Literature: p. 142.

ISBN 978-0-7136-6702-8 (softcover)
§ See also: **Petterson** (Melvyn) & **Gale** (Colin) [No. 238].
Announcement: *Printmaking Today*, 15 (2006), 3: 30.
Review: P. Thirkell, in *Printmaking Today*, 16 (2007), 2: 34.
1 –
Line Etching
2 –
Photopolymer Film
3 –
Printing in Black
NOT SEEN
In: COPAC.

Gale 2 (Colin)   113.1

Practical printmaking / Colin Gale. - London : A&C Black, 2009. - 160 p. : […] fig. ; 28 cm.
List of suppliers: p. 154.
Glossary: p. 156.
Index: p. 159
ISBN 0-7136-8809-2 (softcover)
ISBN 978-0-7136-8809-2 (softcover)
§ Announcement: *Printmaking Today*, 18 (2009) 2: 34.
Review: S. Rorke, in *Printmaking Today*, 18 (2009) 3: 34.
1 –
Collagraph / Drypoint / Line Etching / Soft-ground
2 –
Cardboard / Photopolymer Film / Plastic / Zinc
3 –
Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Digital Printmaking / Lithography / Monotype / Screen Printing / Woodcut
5 –
Health and Safety
NOT SEEN
In: BL.

113.2

Das Praxisbuch der künstlerischen Drucktechniken / Colin Gale. - Bern ; Stuttgart ; Wien : Haupt, 2010. - 160 p. : ill. ; 29 cm.
ISBN 978-3-258-60002-4
NOT SEEN
In: KVK

Ganz (Henry Frank William)   114

Practical hints on painting, composition, landscape, and etching / Henry F[rank] W[illiam] Ganz ; [ill. by Henry Frank William Ganz]. - Philadelphia : Lippincott ; London : Gibbings, 1905. - xiv, 128 p. : [47] ill. ; 22.5–23 cm.
Contents: p. xi.
List of illustrations: p. xiii.
MIP: pp. 105–125 : [11] ill.
Index: p. 127.
§ The illustrations are diagrams and reproductions.
The book is organised like a course book.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Printing in Black
4 –
Drawing / Lithography
5 –
Art History
In: BL; BLBS; NYPL; NUC–1956 (3×); OCLC; ULC.

García Hidalgo (José)   115.1

Principios para estudiar el nobilissimo, y real arte de la pintura, con todo, y partes del cuerpo humano, siguiendo la mejor escuela, y simetrîa, con demostraciones matematicas, que ajustan, y enseñan la proporcion, y perfeccion del rostro, y ciertos perfiles del hombre, muger, y niños / José García Hidalgo ; [etch. by José García Hidalgo]. - Madrid : [José García Hidalgo], 1693. - [6], 11 p. : front., [1] portrait, [147] etch. ; 26–27 cm.
MIP: p. 10.
§ Title means: Principles for studying the most noble, and true art of painting, with the whole, and the parts of the human body, following the major school, and symmetry, with mathematical demonstrations, which compose, and instruct the proportion, and perfection of the human face, and the true outlines for the man, woman, and children
The layout and typography of the different title pages vary.

The number of etchings differ per copy; the total number of different etchings is 147.

The portrait is a self-portrait, but the copy in the Palacio Real has a portrait of Carlos II Rey de España (1691).

Some plates are dated, the latest date is '1691'.

See the English translation below, Cambridge 1986 [No. 115.4]: 133–139.

See the photomechanical reprint, which gives seven copies with locations: Madrid 1965 [No. 115.3].

Title description after: Madrid 1965 [No. 115.3].

Intended audience, p. 11: 'darla à quié no pueda participar de otra mejor, ò quiera, sin cansar à nadie, tener algunas pues en ocasiones se alumbra con una cerilla un caminante'. See: Cambridge 1986 [No. 115.4]: 129: 'those who cannot participate in any other, better way, and so, without tiring anybody ... can still acquire some knowledge'.

1 –
Échoppe / Line Etching
NOT SEEN
In: *Blas Benito 1994*: 68; OCLC.

<div align="right">115.2</div>

Fuentes literarias para la historia del arte español / por Francisco Javier Sánchez Cantón. - Madrid : Junta para ampliación de estudios éinvestigaciones científicas, centro de estudios históricos, 1923–1941. - 5 vol. ; 24.5–25 cm.

§ Title means: Literary sources for the history of Spanish art

– Vol. 3: Tomo III : siglos XVII y XVIII : Lorenzo de San Nicolás, Jusepe Martínez, V[icente] Salvador Gómez, [Félix de] Lucio Espinosa, [Jose] García Hidalgo, [Domingo de] Andrade, [Antonio] Palomino (tomos I–II). - 1934. - X, [2], 317 p.

Index: p. 293.

Contents: p. 317.

Principios para estudiar el arte de la pintura / José García Hidalgo: pp. 97–126.

MIP: pp. 99–102.

§ Republication of the edition: Madrid 1693 [No. 115.1]. Without the frontispiece, the self-portrait, the sonnet, the poem, the introduction and the plates. The text is the same but has been reset and the spelling modernised.

In: BL; DBI-VK (?); KB; NCC; NUC–1956; OCLC; UBG.

<div align="right">115.3</div>

Principios para estudiar el nobilísimo y real arte de la pintura (1693) / José García Hidalgo. - [Photom. repr.] / [edición dirigido por Antonio Rodríguez-Moñino] ; [introducción por Juan Contreras y Lopez de Avala] ; [prologo por Francisco Javier Sanchéz Canton]. - Madrid : Instituto de España, 1965. - 57, 159, [1] fol. : 167 reprod. ; 32.5 cm.

Contents: fol. [1].

Prologue: fol. 1–12r at the beginning.

MIP: fol. 11v at the beginning.

Edition: 500 copies.

§ Title means: Principles for the studying of the most noble and true art of painting.

Photomechanical reprint of: Madrid 1693 [No. 115.1]

The 167 reproductions show the frontispiece (1 p.), the self-portrait (1 p.), a sonnet (1 p.), a poem (4 pp.), the introduction (2 pp.), the prologue (11 pp.) and 147 plates.

Seven copies of the 1793 edition are described, of which six are in private collections and one is kept in the library of the Palacio Real.

In: BL; BNM; DBI-VK; OCLC; RMA; UBA-KHI; UBH; ULC.

<div align="right">115.4</div>

Artists' techniques in golden age Spain : six treatises in translation / ed. and transl. by Zahira Veliz. - Cambridge [etc.] : Cambridge University Press, 1986. - XX, 224 p. : 39 fig. ; 26.5 cm.

Contents: p. V.

MIP: pp. 137–138, notes pp. 210–211.

Literature: p. 217.

Index: p. 221.

ISBN 0-521-32007-0 (hardcover)

§ English translation of the edition Madrid 1693 [No. 115.1]: 133–139.

In: DBI-VK; KB; KSM; NCC; OCLC; RCE; RMA; UBA; UBG; UBL-KHI; UBU.

Gariazzo (Pierro Antonio)   116

La stampa incisa. Trattato dell'arte d'incidere all'acquaforte, al bulino, all'acquatinta, alla maniera nera ed di intagliare il legno / Pierro Antonio Garriazzo ; prefazione di Leonardo Bistolfi. - Torino ; [Genova] : Lattes ; Firenze : Bemporad ; Bologna : Zanichelli, 1907. - XIV, 240 p. : 27 reprod., of which [4] in colour, [6] diagrams ; 15.5–16 cm. - (Collezione Lattes).

List of illustrations: p. XIII.

Contents: p. 239.

§ Title means: The engraved print. A manual on the art of engraving with acid, burin, in aquatint, in mezzotint and in woodcutting

This is probably the first first printed Italian manual for the intaglio printmaker.

1 –
Aquatint / Crayon Engraving / Drypoint / Line Engraving / Line Etching / Mezzotint
2 –
Copper / Steel / Steelfacing / Zinc
3 –
Ink / Paper / Multiple-plate Printing / Printing in Black / Printing Monochrome / Printing Polychrome
4 –
Monotype / Woodcut
5 –
Art History
In: *Blas Benito 1994*: 79; CCB; GLVA: no. 1054; NCC; NUC–1956; OCLC; UBU.

Gauthier de Montdorge (Antoine)
See: **Le Blon** (Jacque Christoph) [No. 180.2].

Incisione sostenibile : nuovi materiali e metodi dell'areau non-toxic / Francesco Genna ; con i contributi di Patrick Aubert, Eva Figueras Ferrer, Chiara Giorgetti, Friedhard Kiekeben, Graza Tagliente. - Marsala : Navarra, 2009. - 133 p. : ill. ; 24 cm.
Glossary: p. 121.
Index: p. 124.
Literature: p. 125.
URL: p. 128.
Contents: p. 133.
ISBN 978-88-95756-17-2 (softcover)
§ Title means: Sustainable engraving: new materials and methods from the non-toxic area
See also: **Figueras Ferrer** (Eva) [Nos. 101 and 441].
Announcement: *Printmaking Today*, 19 (2010) 2: 42, 'the first Italian handbook of non-toxic printmaking'.
1 –
Line Etching
2 –
Copper / Iron / Photopolymer Film / Solarplate
3 –
Printing in Black
5 –
Health and Safety
In: ABE; Priv.Coll.

Die so nöthig als nützliche Buchdruckerkunst und Schriftgießerey / [Christian Friedrich Gessner, Johann Georg Hager, Johann Caspar Müller] ; [ed. Christian Friedrich Gessner] ; I.A. Richter inv. et del. ; C[hristian] F[riedrich] Boetius sculps., [Johann] Syfang sc. - Leipzig : bey Christian Friedrich Geßner, 1740–1745. - 4 vol. : ill. ; 17.5–19 cm.
§ Title means: The so necessary and useful art of bookprinting and letter casting
The illustrations are engravings, etchings and woodcuts. A part of them seems to have been used in other publications because they have page numbers that are not related to the present text.
This four-volume work is published to commemorate three hundred years of book printing. Different copies have different collations.
Photomechanical reprint: Hannover 1981 [No. 118.3].
– Vol. 1: Die so nöthig als nützliche Buchdruckerkunst und Schriftgießerey, mit ihren Schriften, Formaten und allen dazu gehörigen Instrumenten abgebildet auch klärlich beschrieben, und nebst einer kurzgefaßten Erzählung vom Ursprung und Fortgang der Buchdruckerkunst, überhaupt, insonderheit von den vornehmsten Buchdruckern in Leipzig und andern Orten Teutschlandes im 300 Jahre nach Erfindung derselben ans Licht gestellet / mit einer Vorrede Johann Erhard Kappens [Kapp] ; I.A. Richter inv. et del. ; C[hristian] F[riedrich] Boetius sculps., Brühl sc., [Johann] Syfang sc. - 1740. - [28], 140, 262, [2], 112, [8] p. : front., etch. on titlep, [23], [63] ill. of which [11] folding pl.
Contents: pt. 1, p. [27].
Glossary: pt. 2, p. 161.
List of living book printers: pt. 2, p. 249.
Addenda & corrigenda: pt. 2, p. 262.
List of symbols: [8] p. between pp. 248 and 249 (copy HAB) , or, pt. 2, p. [1] (copy UBA).
Directions to the bookbinder, at the same time list of illustrations: pt. 2, p. [1] (copy HAB).
§ The text of this volume has two parts.
The author of the introduction is Johann Erhard Kapp.
The preface is dated, p. [26]: 'Geschrieben zu Leipzig den 7. april 1739'.
The glossary contains some terms related to intaglio printmaking.
Reprints of excerpts of vol. 1: Frankfurt 1927 [No. 118.2]; Ludwigsburg 1993 [No. 118.4].
– Vol. 2: Der so nöthig als nützliche Buchdruckerkunst und Schriftgießerey. Zweyter Theil. dem ein kurtz gefäßte Nachricht von einigen Buchdruckern so wohl inn- als ausserhalb Teutschland vorgesetzet / Brühl sc., [Johann] Sysang sc., [Johann Michael?] Fleischman ad viv. sculp. - 1740. - [16], 224, [204], [4], [60] p. : 52 ill.
Glossary: p. 187.
Index: p. [143].
§ This part does not contain any information on intaglio printmaking.
– Vol. 3: Die so nöthig als nützliche Buchdruckerkunst und Schriftgießerey. Dritter Theil, dem nicht nur ein kurzes Verzeichnis von den vornehmsten Jubelschriften, sondern auch eine ausführliche Nachricht, wie die Jubelfeyer hier und da begangen worden, und alsdenn die Fortsetzung der Buchdrucker-Historie vorgesetzet ist / [I.A.] Richter del. ; [Johann Martin oder Johann Benedikt] Bernigeroth sc., [Johann Benjamin?] Brühl sc. - 1741. - [28], 503 p. : front., V, [7] Fig., XXXV Tab.
MIP: pp. 402–418 : VI Fig.
Initials and monograms of engravers: p. 423.
Glossary: p. 440.
§ The glossary contains a number of terms related to intaglio printmaking.
– Vol. 4: Der so nöthig als nützlichen Buchdruckerkunst und Schriftgießerey, vierter und letzter Theil. In welchen nicht nur ein fortgesetztes Verzeichniß von den vornehmsten Jubelschrifften, sondern auch eine ausführliche Nachricht, wie die Jubelfeyer hier und da begangen worden, und alsdenn die Fortsetzung der Buchdrucker Historie vorgesetzet ist / Mich[ael] Keyl del. et sculp., [Johann] Syfang sc., Joh[ann] Georg Schmidt sculps., [Johann Benjamin?] Brühl sc. - 1745. - [16], 240, [86], 144 p. : [100] ill.
Index to vol. 3 and 4: vol. 4, after p. 240.

§ The title page of vol. 4 has the date: '1745'. The preface is dated, p. [16] at the beginning: 'Leipzig den 1 Jan. 1745.' Further dating, p. 240: 'Ende des vierdten und letzten Theils, So vollendet im Jahr Ein tausend siebenhundert und vier und viertzig [1744], von Christian Friedrich Geßner, der Kunst Verwandten.'

1 –
Line Engraving
2 –
Copper
3 –
Counterproof / Ink / Multiple-plate Printing / Press / Printing in Black / Printing Monochrome / Printing Polychrome
4 –
Monotype / Typography / Woodcut
5 –
Art History
In: BL; BLBS; CCB; DBI-VK; HAB; KB; NCC; NSUG; NUC–1956; OCLC; ÖNB; UBA; UBH (vol. 2, 3); UBL (vol. 1–3); ULC.

118.2

Bericht von dem Schriftgießen : ein Auszug aus dem Handbuch 'Die so nöthig als nützliche Buchdruckerkunst und Schriftgießerey' bey Christian Friedrich Geßner, Leipzig 1740. - [Repr.]. - Frankfurt a[m] M[ain] : Ludwig & Mayer [printer], 1927. - P. 131–138 : 1 pl. ; 8º.
§ Title on cover: Die so nöthig als nützliche Buchdruckerkunst und Schriftgießerey
Reprint of an excerpt of vol. 1 of: Leipzig 1740–1745 [No. 118.1].
Not for publication.
Concerns typesetting only; without information on intaglio printmaking.
NOT SEEN
In: DNB-L.

118.3

Die so nöthig als nützliche Buchdruckerkunst und Schriftgießerey … [etc.] / [Christian Friedrich Gessner, Johann Georg Hager, Johann Caspar Müller]. - Nachdruck. - Hannover : Schlütter, 1981. - 2 vol. : ill. ; 30 cm.
ISBN 3-87706-182-6 (hardcover)
§ Contains information about typography only; without information on intaglio printmaking.
Photomechanical reprint of: Leipzig 1740–1745 [No. 118.1].
In: BNM; HAB; UBA; ULC.

118.4

Die so noethig als nuetzliche Buchdruckerkunst und Schriftgießerey : im 300. Jahre nach Erfindung derselben ans Licht gestellet und mit Kupfern ausgezieret / bey Christian Friedrich Geßner. - [Repr.] - Ludwigsburg : Schuldruck-Zentrum, 1993. - 85 p. : ill. ; 21 cm.
§ Photomechanical repr. of an excerpt of vol. 1 of: Leipzig 1740–1745 [No. 118.1].
Contains information about typography only; without information on intaglio printmaking.
NOT SEEN
In: KVK.

Gilmour (Pat)   119

Artists in print : an introduction to prints and printmaking / Pat Gilmour ; ed. John. Radcliffe. - London : British Broadcasting Corporation, 1981. - 144 p. : [1], 9, 74, 87, 73, 69, 35 ill., of which [43] in colour ; 29.5 cm.
MIP: pp. 33–60 : 87 ill., of which [5] in colour.
Contents: p. 5.
List of printshops: p. 143.
ISBN 0-563-16449-2 (softcover)
§ The illustrations are diagrams, photographs and reproductions.
'Published to accompany the BBC Continuing Education Television Series "Artists in Print" produced by Suzanne Davies. First broadcast on BBC-2 on Monday from 9 March 1981'. 'Published to accompany a series of programmes prepared in consultation with the BBC Continuing Education Advisory Council.'
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Printing in Black / Ink
4 –
Linocut / Lithography / Photomechanical Processes / Screen Printing / Typography / Wood Engraving
5 –
Art History / Original and Reproduction
In: BL; NCC OCLC; Priv.Coll.; ULC.

Ginkel 1 (Freek van)   120

Etsen / Freek van Ginkel ; ill. door Freek van Ginkel ; [photogr.] Gerhard Jaeger. - Amsterdam : Bakker, 1981. - 85 p. : ill. ; 18 cm.
Contents: p. 7.
Suppliers: p. 85.
ISBN 90-6019-784-4 (softcover)
§ Title means: Etching
The illustrations are diagrams and reproductions.
1 –
Aquatint / Crayon Etching / Drypoint / Échoppe / Lift-ground / Line Etching / Mezzotint / Photomechanical Etching / Relief Etching / Soft-ground

2 –
Aluminium / Brass / Copper / Iron / Plastic / Steelfacing / Zinc
3 –
Blind Embossment / Hand-colouring / Ink / Jigsaw Print / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Screen Printing
5 –
Art History
In: BL; GBR; GDH; KB; NBLC; NCC; OBA; OCLC; Priv.Coll. (2×); RAA (2×); UBR.

Ginkel 2 (Freek van)   121.1

Grafische technieken / tekstbijdragen en afbeeldingen Ronald Wigman, Marleen Doensen, Sonja van Rijn, Guus Hoelen, Simone Robbers, Lidwien Chorus, Freek van Ginkel, Wouter Boeschoten, Ortho Owen, Ove Lucas, Jan van Oosten, Marleen Buddemeijer, Juliëtte Swillens ; samenstelling en redactie Marleen Buddemeijer, Henny van der Eng en Sonja Suk ; fotografie Hans Dirksen, Igor Fischer. - [1st ed.]. - Utrecht : Teleac ; Purmerend : Muusses, 1985. - 364 p. : ill., partly in colour ; 31 cm.
Colophon: p. 4.
Contents: p. 7.
MIP: diepdruk / Freek van Ginkel. - P. 203–272; [110] ill., of which [80] in colour.
Glossary: p. 360.
Safety priority and list of stains: p. 363.
ISBN 90-6533-087-9 (loose sheets in ring binder)
§ Title means: Graphic techniques
Title on cover: Grafische technieken : linosnede / houtsnede / zeefdruk / lithografie / droge naald / lijnets / aquatint / typografie
Title on the cover means: Graphic techniques: linocut / woodcut / screen printing / lithography / drypoint / line etching / aquatint / typography
Loose sheets in ring binder.
The illustrations are diagrams, photographs and reproductions.
Course book to accompany television and radio broadcasting courses; the courses were also available on video- and audiocassettes.
– Additional teacher's guide: Grafische technieken : docentenhandleiding praktijklessen behorend bij de Teleac-kursus / samenstellers Rob van der Galiën ... [et al.] ; adviezen Saskia van Gent ... [et al.] ; eindredaktie Theo van der Hoeven. - [Utrecht] : Teleac, LOKV, VCO, [1986].
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Aluminium / Brass / Copper / Plastic / Zinc
3 –
Hand-colouring / Ink / Jigsaw Print / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing
4 –
Linocut / Lithography / Marbling / Monotype / Nature Printing / Photography / Screen Printing / Typography / Woodcut
5 –
Aesthetics / Art History / Health and Safety
In: NCC (16×); Priv.Coll. (2×); UBA (2×).

121.2

Grafische technieken / tekstbijdragen en afbeeldingen Ronald Wigman, Marleen Doensen, Sonja van Rijn, Guus Hoelen, Simone Robbers, Lidwien Chorus, Freek van Ginkel, Wouter Boeschoten, Ortho Owen, Ove Lucas, Jan van Oosten, Marleen Buddemeijer, Juliëtte Swillens ; samenstelling en redactie Marleen Buddemeijer, Henny van der Eng en Sonja Suk ; fotografie Hans Dirksen, Igor Fischer. - [1st ed.]. - Utrecht : Teleac ; Purmerend : Muusses, 1985. - 364 p. : ill., partly in colour ; 31 cm.
Colophon: p. 4.
Contents: p. 7.
MIP: diepdruk / Freek van Ginkel. - P. 203–272; [110] ill., of which [80] in colour
Glossary: p. 360.
Safety priority and list of stains: p. 363.
ISBN 90-231-8055-0 (hardcover)
§ Bound edition.
In: NCC (13×).

121.3

Grafische technieken / tekstbijdragen en afbeeldingen Ronald Wigman, Marleen Doensen, Sonja van Rijn, Guus Hoelen, Simone Robbers, Lidwien Chorus, Freek van Ginkel, Wouter Boeschoten, Ortho Owen, Ove Lucas, Jan van Oosten, Marleen Buddemeijer, Juliëtte Swillens ; samenstelling en redactie Marleen Buddemeijer, Henny van der Eng en Sonja Suk ; fotografie Hans Dirksen, Igor Fischer. - [2nd ed.]. - Utrecht : Teleac, 1988. - 364 p. : ill., partly in colour ; 30 cm.
Colophon: p. 4.
Contents: p. 7.
MIP: diepdruk / Freek van Ginkel. - P. 203–272; [110] ill., of which [80] in colour.
Glossary: p. 360.
Safety priority and list of stains: p. 363.
ISBN 90-6533-087-9 (hardcover)
§ Publisher on cover: Tirion Recrea.
In: NCC (11×); Priv.Coll.

Glorez (Andreas)   122
Der vollständige Hauß- und Landbibliothec, worinnen der Grund unverfälschter Wissenschafft zu finden ist, deren sich bey jetziger Zeit ein Hof- Handels- Hauß- Burgers- und Land-Mann zu seinem reichlichen Nutzen bedienen kan. Abgetheilt in vier Theil ... [etc.] / durch Andream Glorez ;

Jacob Petrus sculpsit. - Regenspurg : in Verlegung Quirini Heyl, 1699. - 4 vol. : ill. ; 32 cm.

§ Title means: The complete house and estate library (etc.)

Only this edition, vol. 3, has instructions for intaglio printmaking. All later editions and extensions do not contain any information on engraving or etching.

Intended audience, title page: 'Hof- Handels- Hauß- Burgers- und Land-Mann'.

– Vol. 1: Der vollständige Hauß- und Landbibliothec Erste Theil … [etc.]. - [6], 450 p. : front., 41 Fig.

§ Without information on intaglio printmaking.

– Vol. 2: Der vollständigen Haus- und Land-Bibliothec Andere Theil … [etc.]. - [4], 239, [5], 54 p. : 1 Fig.

§ Without information on intaglio printmaking.

– Vol. 3: Der vollständige Hauß- und Landbibliothec Dritter Theil. Welcher offenbahret gantz seltzam und höchst-verwunderliche theils aus frembden Sprachen in das Teutsche übersetzte, sehr viel auch durch scharpff und tieffes Nachsinnen erst neu erfundnen Künsten, denen hohen Herrn zu ergößlicher Zeit-Vertreibung, dem gemeinen Mann aber zu reichlicher Nahrung gelangend. - [4], 108 p. : [11] Fig.

MIP: Das IV. Capitel. Bericht, wie die schwartze Kunst in Kupffer zu machen ist. - P. 13 : Fig. [1]–[2].

– Vol. 4: Der vollständigen Haus- und Land-Bibliothec Vierdter Theil … [etc.]. - [4], 24, 98, 15, 32 p.

Contents and index on all volumes: p. 1–32 at the back.

1 –

Mezzotint

2 –

Copper

3 –

Casting / Ink / Paper / Press / Print behind Glass / Printing in Black

4 –

Painting

In: BL; BS; DBI-VK; NSUG; OCLC; UBH ('Kriegsverlust').

Goeree (Willem)

See: **Brugghen** (Gerard ter) [No. 050].

See: **Witgeest** (Simon) [No. 357].

Görlitz (Alois Kosch)

See: **Kosch-Görlitz** (Alois) [No. 171].

Goetz (Henri Bernard) 123.1

Gravure au carborundum : nouvelle technique de l'estampe en taille douce / Henri [Bernard] Goetz. - [Paris] : Editions Maeght, [1969]. - 39, [18] p. : 4 facsimiles, 24 reprod., of which [2] in colour ; 20.5 cm.

Contents: p. 3.

Suppliers: p. 13.

Facsimiles: p. [2].

Reproductions: p. [6].

List of reproductions: p. [18].

§ Title means: Carborundum engraving: new intaglio printmaking technique

For a later variation of the process see: **Rousseau-Leurent** (Villefranche-sur-mer 1991) [No. 276].

See also the article on the subject: **Goetz** (1973) [No. 461].

1 –

Aquatint / Carborundum Print / Collagraph / Crayon Engraving / Drypoint / Mezzotint / Pyrogravure

2 –

Aluminium / Copper / Plastic / Steel / Steelfacing / Zinc

3 –

Multiple-plate Printing / Printing in Black / Printing Monochrome / Printing Polychrome

In: OCLC; Priv.Coll.

123.2

L'oeuvre gravé de Henri Goetz 1940–1972 / catalogue réalisé par Gunnar Bergström ; [preface by C. Tisari] ; photo's Hans Hartung, Alain Resnais, Marie-Paul Nègre, P. Lebrun ; traductions anglaises Arne Häggqvist, Silvie Schwepps, Elisabeth Steiner. - Stockholm : Editions Sonet, cop. 1973. - 126, [2] p. : [8] photogr., 167 reprod. ; 21 × 23 cm.

Biographie: p. 11, 14.

Literature: p. 12, 15.

MIP: pp. 123–126.

Edition: 2,000 copies.

§ Texts in French and English on facing pages.

MIP: Nouveau procédés techniques (en supplement à l'ouvrage sur la gravure au carborundum = New technics [sic!] (A supplement to the book 'la gravure au carborundum').

Edition: 'De ce livre il a été tiré une édition de luxe en 150 exemplaires numérotés, 1–50 comportant trois grandes gravures en couleurs et trois petites gravures en couleurs toutes signées. Les cinq premiers numéros comportent en outre une gravure signée colorée a la main en pastel, 51–100 comportant trois grandes gravures en couleurs signées, 101–150 comportant trois petites gravures en couleurs signées, l'édition ordinaire de ce livre a été imprimée en 1.850 exemplaires'.

MIP is an extension to the first edition.

1 –

Carborundum Print

2 –

Aluminium

In: BL; KB; Priv.Coll.

<div align="right">123.3</div>

Gravure au carborundum : nouvelle technique de l'estampe en taille douce / Henri [Bernard] Goetz. - Éd. cor. et augm. de nouveau procédés. - Paris : Maeght, 1974. - 52, [16] p. : ill. ; 21 cm.
§ Illustrations: pp. [1]–[16].
NOT SEEN
In: *Blas Benito 1994*: 80; *Figueras Ferrer 1992*: 1048.

Gómez Burón (Joaquín)
See: **Etstechnieken** [No. 096.4].

Gormley (David)
See: **Robertson** (Bruce) & **Gormley** (David) [No. 267].

<div align="right">**Goulding** (Frederick)   124</div>

Frederick Goulding : master printer of copper plates / by Martin Hardie ; [etch. by R.W. Macbeth and Frederick Goulding]. - Stirling : MacKay, 1910. - 167 p. : front., [9] pl., [1] musical annotation ; 30.5 cm.
Contents: p. 5.
List of illustrations: p. 7.
MIP: pp. 67–104 : 4 ill.
Catalogue of Goulding's etchings: p. 157.
Contents: p. 165.
With literature.
Edition: 350 copies, of which 250 for sale.
§ Although strictly speaking not a practical manual, Goulding's notes are so instructive that this book is selected for the present bibliography.
Levis: 'Although dated 1910, the volumes for sale were issued in July 1911'.
The plates are line blocks, photogravures, collotypes and etchings.
The book was compiled to commemorate the plate printer Frederick Goulding (1842–1909).
2 –
Copper / Steelfacing
3 –
Chine Collé / Ink / Paper / Press / Printing in Black
5 –
Conservation and Restoration
In: BL; BN; *Bridson & Wakeman 1984*: no. B75; KB; *Levis 1912*: 523–524; MET; NUC–1956; OCLC; Priv.Coll. (2×); RMA; UBA; UBL; ULC.

<div align="right">**Grabowski** (Beth)   125</div>

A printshop handbook : a technical manual for basic intaglio, relief, and lithographic processes / Beth Grabowski. - Madison, Wis. : Brown & Benchmark, [cop. 1994]. - xiv, 155 p. : [25] ill. ; 28 cm.
Contents: p. vii.
Intaglio Printmaking: p. 11–55 : [13] ill.
Toxic Substances Chart: p. 141.
Suppliers: pp. 141, 144.
References: p. 147–148.
Glossary: p. 149.
Index: p. 153.
ISBN 0-697-14489-5 (loose sheets in spiral binding)
§ The illustrations are diagrams and photographs in b/w.
1 –
Aquatint / Carborundum Print / Collagraph / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Chine Collé / Ink / Multiple-plate Printing / Paper / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Linocut / Lithography / Monotype / Woodcut
5 –
Health and Safety
In: HAB; LC; Priv.Coll.

<div align="right">**Grabowski** (Beth) & **Fick** (Bill)   126.1</div>

Printmaking : a complete guide to materials & processes / Beth Grabowski, Bill Fick. - London : King, 2009. - 240 p. : [657] ill., of which [566] in colour ; 29.5 cm.
Contents: p. 5.
MIP: pp. 103–156, 224–226 : [195] ill.
Glossary: p. 230.
Suppliers: p. 234.

Index: p. 236.
ISBN 978-1-85669-600-5 (hardcover)
§ The illustrations are diagrams, photographs and reproductions.
Announcement: *Printmaking Today*, 19 (2010) 1: 42.
Review: N. Morley, in *Printmaking Today*, 19 (2010) 2: 42.
1 –
Aquatint / Collagraph / Drypoint / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Copper / Zinc
3 –
Printing à la Poupée / Chine Collé / Ink / Multiple-plate Printing / Paper / Printing in Black / Printing Polychrome
4 –
Digital Printmaking / Monotype / Lithography / Screen Printing / Troubleshooting / Woodcut
5 –
Art History / Health and Safety
In: Priv.Coll.

126.2

Manuel complet de gravure / Beth Grabowski, Bill Fick, Jean-Claude Gerodez ; Jérôme Wicky [transl.]. - Paris : Eyrolles, 2009. - 240 p. : ill., partly in colour ; 30 cm.
Literature: p. 235.
With glossary.
With index.
ISBN 2-212-12419-8 (hardcover?)
ISBN 978-2-212-12419-4 (hardcover?)
NOT SEEN
In: BNP.

126.3

Drucktechniken. Das Handbuch zu allen Materialien und Methoden / Beth Grabowski, Bill Fick ; übers. von Barbara Hess, Angelika Thill, Petra Trinkaus. - Köln : DuMont, 2010. - 240 p. : ill. ; 30 cm.
Contents: p. 5.
MIP: pp. 103–156, 224–226
Glossary: p. 230.
Suppliers: p. 234.
Index: p. 236.
ISBN 3-83219337-5
ISBN 978-3-83219337-9
NOT SEEN
In: KVK.

Graziani (Paolo)   127

L'incisione in cavo : tecniche di resa tonale su ferro e acciaio. Tecniche, strumenti e materiali / Paolo Graziani ; [photogr.] P. Pallecchi, F. Cinotti. - [Firenze] : [Opus Libri], [1991]. - 75 p. : 26 ill. ; 21 cm.
Contents: p. 5.
Bibliography: p. 74.
List of illustrations: p. 75.
§ Title means: Intaglio engraving: tonal rendering on iron and steel. Techniques, tools and materials
The illustrations are photographs and reproductions.
1 –
Aquatint / Crayon Etching / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Copper / Iron / Steel / Zinc
3 –
Ink / Paper / Printing in Black
5 –
Art History
In: OCLC; Priv.Coll.; RMA.

Green (Cedric)   128.1

Green prints : a handbook on some new methods for safe intaglio etching and metal plate printmaking / Cedric Green ; all illustrations are by the author. - [1st ed.]. - Sheffield : Ecotech Design, 1998. - 50 p. : ill. ; 21 cm.
§ Letter by the author of 28 January 1999: 'Up to now my booklet has been produced in very small numbers – not more than 100 so far – and I have reprinted it in very small batches on an ink jet printer, which has given me the chance to add to it and improve it. The changes have been collected, and each time I make a group of changes I make a new edition number. I have tried to keep to the same number of pages (to keep the weight down for postage) by making some illustrations smaller, or leaving some out, or by reducing the font size, and reducing the margins. The index has to be regenerated each time, but the contents list has changed very little. The first edition did not have an index, was entirely in black & white [and] was dated March 1998.'
See the author's websites: http://perso.club-internet.fr/gravert/index.htm (2010), http://www.greenart.info/galvetch/contfram.htm (2010).
1 –
Aquatint / Electrolytic Etching / Line Etching / Mezzotint / Soft-ground
2 –

Copper / Steel / Zinc
5 –
Health and Safety
NOT SEEN

128.2

Green prints : a handbook on some new methods for safe intaglio etching and metal plate printmaking / Cedric Green ; all illustrations are by the author. - [2nd ed.]. - Sheffield : Ecotech Design, 1998. - 50 p. : ill., partly in colour ; 21 cm.
§ 'The second [edition] included some colour illustrations, and index, but with very few text changes and came out in April '98'; letter by the author of 28 January 1999.
NOT SEEN
In: BL; KVK.

128.3

Green prints : a handbook on some new methods for safe intaglio etching and metal plate printmaking / Cedric Green ; all illustrations are by the author. - [3rd ed.]. - Sheffield : Ecotech Design, 1998. - 50 p. : ill., partly in colour ; 21 cm.
§ Letter by the author of 28 January 1999: 'The third followed very soon after with significant text changes as a result of my experiences since the first edition, also dated April '98'.
NOT SEEN

128.4

Green prints : a handbook on some new methods for safe intaglio etching and metal plate printmaking / Cedric Green ; all illustrations are by the author. - Fourth ed. - Sheffield : Ecotech Design, 1999. - 50 p. : [24] ill., of which [12] in colour ; 21 cm.
URLs: p. 3, 44.
Contents: p. 4.
Literature: p. 43.
Index: p. 47.
§ Letter by the author of 28 January 1999: 'the fourth [edition] was very recently updated with my experience with [etching electroliticaly] large plates and to incorporate some of the research I'd done into the history of electrolytic methods.' Added are some passages from: Electrotype manipulation. Part II. Containing the theory, and plain instructions in the arts of electro-plating, electro-gilding, and electro-etching; with an account of the mode of depositing metallic oxides, and of the several applications of electrotype in the arts / Charles V. Walker. - 19th ed. - London : George Knight and Sons, 1855.
In: Priv.Coll.

128.5

Green prints : a handbook on some new methods for safe intaglio etching and metal plate printmaking / Cedric Green ; all illustrations are by the author. - Fifth ed. - Sheffield : Ecotech Design, 1999. - 60 p. : [31] ill., of which [14] in colour ; 21 cm.
URLs: p. 3, 52.
Contents: p. 4.
Literature: p. 50.
Index: p. 56.
§ This text is largely translated and incorporated in **Figueras Ferrer** (Barcelona 2004).
In: Priv.Coll.

Green (J.H.)   129.1

The complete aquatinter : being the whole process of etching and engraving in aquatinta; the use of aquafortis, with all the tools necessary; together with upwards of fifty of the best receipts, for grounds, varnishes, &c. Collected from near a hundred that are most in use: the difficulties which may possibly occur pointed out, and the method shewn how to obviate them: the whole rendered clear and practical / [J.H. Green]. - [1st ed.]. - [London] : [J.H. Green?] ; Hartfield : printed by W. Morphew, 1801. - IV, 23, [1] p. : 1 pl. ; 19–20 cm.
§ *Bridson & Wakeman*: 'The pl. shows 9 specimens of aquat. grounds'. **Hubbard 1** (London 1920) [No. 153]: 145, 'Plate showing ten different specimens of grounds'.
NOT SEEN
In: *Blas Benito 1994*: 68; *Bridson & Wakeman 1984*: no. B43; *Levis 1912*: 94–95 ; NUC–1956.

129.2

The complete aquatinter; being the whole process of etching and engraving in accquatinta; the method of using the aquafortis, with all the necessary tools. To which are added, upwards of sixty of the best receipts for grounds, varnishes, &c. collected from near a hundered that are most in use: the difficulties which may possibly occur, are pointed out, and the method of obviating them: the whole rendered clear and practical / [J.H. Green] ; dedication by J.H. Green; [J.H. Green del. et scu., I. Ieakes scu.]. - The second ed., with many valuable improvements and additions, amongst which are madame Prestel's ground, etching upon glass, the new method of corroding the copper without the aid of aquafortis, &c. - London : for J.H. Green, 1804. - VIII, 25, [3] p. : front., 3 pl. ; 18.5–20 cm.
Specimens: pl. II, III.
Suppliers: p. 14, [3].
Contents: p. [1].
List of illustrations: p. [2].
Advertisement: p. [3].
§ Title on cover: The art of engraving aquatinta &c.
OCLC: 'Engraved illustration mounted on front wrapper.' This is pl. IV, p. [2]: 'The Label on the outside, of two Boys flying, in the same manner as the above.'
Title description after microfilm.
1 –
Aquatint / Lift-ground / Line Etching / Soft-ground
2 –
Copper
In: BL; BLBS; *Bridson & Wakeman 1984*: no. B44; *Levis 1912*: 95; NSTC 1: no. G1928; NUC–1956; *Singer & Strang 1897*: no. 83.

The complete aquatinter : being the whole process of etching & engraving in aquatinta, the method of using the aquafortis, with all the necessary tools : to which are added, upwards of sixty of the best receipts for grounds, varnishes, etc. / [J.H. Green]. - [3rd ed.] with many … improvements and additions. - [London?] : [...], 1810. - VIII, 29 p. ; front., 4 pl. ; 18–20 cm.
§ *Bridson & Wakeman*, NSTC 1: identical to the second edition, but with a new frontispiece.
NOT SEEN
In: BL; *Bridson & Wakeman 1984*: no. B44; *Levis 1912*: 95; NSTC 1: no. G1928.

Gross (Anthony) 130.1

Etching, engraving, and intaglio printing / Anthony Gross. - [1st ed.]. - London ; New York ; Toronto : Oxford University Press, 1970. - xi, [1], 172 p. : 70 ill. ; 25 cm.
Contents: p. vii.
List of illustrations: p. ix.
Suppliers: p. 164.
Literature: p. 166.
Index: p. 168.
Stocklist: flap of backside cover.
SBN 19-211438-7 (hardcover)
§ The illustrations are diagrams and reproductions.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Aluminium / Copper / Iron / Steel / Steelfacing / Zinc
3 –
Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Monotype
5 –
Aesthetics / Art History
In: BL; *Blas Benito 1994*: 80; BLBS; BNB50; BNM; FCG; KB; KBR; MET, 7th suppl. 1977; NCC; OBA; OCLC (25×); Priv.Coll.; RAA; RAL; UBA (2×); UBAB; UBL-KHI; UBU; ULC.

130.2

Etching, engraving, and intaglio printing / Anthony Gross. - Rev. and abridged ed. - London ; New York ; Toronto : Oxford University Press, 1973. - x, [1], 131 p. : 60 ill. ; 20.5 cm. - (Oxford Paperbacks, handbooks for artists ; 13).
Contents: p. v.
List of illustrations: p. vi.
Suppliers: p. 127.
Literature: p. 128.
Index: p. 129.
Titles in the series: inside backcover.
ISBN 0-19-289916-3 (softcover)
§ Paperback version of the edition: London 1970.
With less text and illustrations, and of a smaller format. Without the parts on aesthetics and art history.
In: BL; BLBS; BNB50; *Figueras Ferrer 1992*: 1040; KUB; NCC; OCLC (17×); Priv.Coll.; ULC.

Guadix (Juan Carlos Ramos)
See: **Ramos Guadix** (Juan Carlos) [No. 258].

Gütle (Johann Conrad)
See: **Bosse** (Abraham; Nürnberg 1795–1796) [No. 042.25].

Gutiérrez Larraya (Tomás) 131

Técnicas del grabado artístico / Tomás Gutiérrez Larraya. - Buenos Aires : Molino, 1944. - (Manuales Practicos Molino)
§ Title means: Techniques of artistic engraving
NOT SEEN
In: *Blas Benito 1994*: 81.

H

H. (G.)
See: **G.H.** [No. 111].

Hacking (Nicholas) 132.1

Practical printmaking / Nicholas Hacking, Francis Tinsley, Silvie Turner, Bernard Fitzsimmonds ; introduction Robin Bagilhole ; house ed. Sue Butterwort. - Secausas, NJ : Chartwell Books, cop. 1983. - 125 p. : [148] ill., of which [24] in colour ; 29 cm.
MIP: Etching and engraving / Francis Tinsley. - P. 34–61, 80–81 : [40] ill., of which [6] in colour.

Literature: p. 120.
European suppliers: p. 122.
American suppliers: p. 124.
Index: p. 125.
ISBN 0-89009-536-1 (hardcover)
§ The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching
2 –
Aluminium / Copper / Plastic / Steel / Steelfacing / Zinc
3 –
Ink / Multiple-plate Printing / Press / Printing in Black / Printing Polychrome
4 –
Photography / Linocut / Lithography / Nature Printing / Screen Printing / Wood Engraving
In: OCLC; Priv.Coll.

132.2

Practical printmaking / Nicholas Hacking, Francis Tinsley, Silvie Turner, Bernard Fitzsimmonds ; introduction Robin Bagilhole ; house ed. Sue Butterwort. - Newton Abbot : David & Charles, cop. 1983. - 125 p. : [148] ill., of which [24] in colour ; 29 cm.
Literature: p. 120.
Index: p. 125.
ISBN 0-7153-8494-5 (hardcover?)
NOT SEEN
In: ULC.

132.3

Practical printmaking / Nicholas Hacking, Francis Tinsley, Silvie Turner, Bernard Fitzsimmonds ; introduction Robin Bagilhole ; house ed. Sue Butterwort. - [2nd ed.]. - London : Connoisseur, 1989. - 125 p. : [148] ill., of which [24] in colour ; 29 cm.
MIP: Etching and engraving / Francis Tinsley. - P. 34–61, 80–81 : [40] ill., of which [6] in colour.
Literature: p. 120.
European suppliers: p. 122.
American suppliers: p. 124.
Index: p. 125.
ISBN 1-85361-112-3 (hardcover)
§ Unchanged reprint.
In: OCLC; Priv.Coll.

132.4

Guia prático de gravura / Nicholas Hacking, Francis Tinsley, Silvie Turner, Bernard Fitzsimmonds ; introdução Robin Bagilhole ; tradução Filipe António Guerra. - Lisboa : Estampa, cop. 1996. - 125 p. : [148] ill., of which [24] in colour ; 31.5 cm.
MIP: Gravure em metal / Francis Tinsley. - P. 34–61, 80–81 : [40] ill., of which [6] in colour.
Literature: p. 120.
European suppliers: p. 122.
American suppliers: p. 124.
Index: p. 125.
ISBN 972-33-1198-4 (hardcover)
In: BNL; Priv.Coll.

Hager (Johann Georg)
See: **Gessner** (Christian Friedrich) [No. 118].

Hamerton (Philip Gilbert)   133.1

The etcher's handbook. Giving an account of the old processes, and of processes recently discovered / by Philip Gilbert Hamerton ; illustrated by the author. - [1st ed.]. - London : Roberson, 1871. - viii, 88, ii, 32 p. : front., VI pl., [1] ill. ; 18–19.5 cm.
Contents: p. iii.
Supplier: p. 70.
List of publications by the author: p. 85.
Advertisement: p. i at the back, p. 1 at the back.
§ P. iv is numbered 'vi'.
The plates are etchings, the illustration is a diagram. Plate IV is used as a frontispiece.
Date in text, p. 38: 'this summer (1871)'.
Review: *The Art-Journal*, new series 11 (1872): 128.
Photomechanical reprint: Freeport 1972 [No. 133.7].
Roberson's 'Priced Catalogue' of artists' materials is not bound with every copy and apparently was still in preparation when the present book was published; information on loose pink strip of paper inserted in some copies.
P. 70: 'as for learning to print, the etcher must get some copper-plate printer to teach him. He will learn the art in a dozen lessons.' 'Casting' and 'Rubbing' are mere references without much detail.
See also: **Hamerton 1** (1866) [No. 470]; **Hamerton 2** (1870) [No. 471]; **Hamerton 3** (1875), [No. 472].
1 –
Drypoint / Lift-ground / Line Etching / Soft-ground
2 –
Copper
3 –

Casting / Press / Rubbing

5 –

Art History

In: BL; *Blas Benito 1994*: 68; BLBS; *Bridson & Wakeman 1984*: no. B25; CCB; GMPL; KCA; LC; *Levis 1912*: 105; NUC–1956; OCLC; Priv.Coll. (2×); *Singer & Strang 1897*: no. 254; ULC.

133.2

The etcher's handbook. Giving an account of the old processes, and of processes recently discovered / Philip Gilbert Hamerton ; illustrated by the author. - 2nd ed. - London : Roberson, 1875. - viii, 94 p. : VI pl. ; 18–20 cm.

§ *Bridson & Wakeman*: 'The 2nd edn. adds a technical note on the preparation of each. pl.'

NOT SEEN

In: BL; BLBS; *Bridson & Wakeman 1984*: no. B25; *Levis 1912*: 105; NUC–1956; OCLC (16×); Priv.Coll.; *Singer & Strang 1897*: no. 265.

133.3

The etcher's handbook : giving an account of the old processes, and of processes recently discovered / by Philip Gilbert Hamerton ; illustrated by the author. - Third ed., rev. and augm. - London : Roberson ; Boston, Mass. : Roberts, 1881. - xi, [2], 1–88, [2], 89–97, [5], 40 p. : [6] pl., ill. ; 19 cm.

Contents: p. iii.

Stocklist: p. 40 at the back.

Advertisement: p. [1] in the middle, p. 1 at the back.

With addenda & corrigenda.

§ Preface to the third edition dated, p. vii: 'London - December, 1880'.

The advertisement for the firm of Roberson in **Lalanne** (London 1884) [No. 178.15] is the same as in the present edition.

Announcement: *American Art Review*, 2 (1880) 6: 250.

Review: *American Art Review*, 2 (1880) 11: 207–208.

1 –

Drypoint / Lift-ground / Line Etching / Soft-ground

2 –

Copper

3 –

Ink / Paper / Printing in Black

In: BL; BLBS; *Bridson & Wakeman 1984*: no. B29; CCB; *Levis 1912*: 105; OCLC (48×); Priv.Coll. (2×); RKD; RMA; *Singer & Strang 1897*: no. 298; UBU-KHI.

133.4

[Notes on etching]. - [S.l.], [c. 1900].

In: **Hamerton** (London, Boston, 1881) [No. 133.3]: front flyleaf verso, title page recto.

§ Manuscript.

Language: English.

Pencil notes with recipes and utensils needed for etching. Other pencil notes on the back flyleaf recto are money calculations and seem not related to printmaking.

1 –

Line Etching

In: Priv.Coll.

133.5

The etcher's handbook : giving an account of the old processes, and of processes recently discovered / by Philip Gilbert Hamerton ; illustrated by the author. - Third [sic!] ed., rev. and augm. - London : Charles Roberson, 1881. - xi, [2], 1–88, [2], 89–97, [5], 40 p. : [6] pl., ill. ; 19 cm.

Contents: p. iii.

Stocklist: p. 40 at the back.

Advertisement: p. [1] in the middle, 1 at the back.

With addenda & corrigenda.

§ Identical to the above third edition, except for the *impressum*.

In: RMA; UBA.

133.6

The etcher's handbook : giving an account of the old processes, and of processes recently discovered / by Philip Gilbert Hamerton ; illustrated by the author. - [4th ed.]. - London : Roberson, 1912. - […] p. : […] ill. ; 19 cm.

NOT SEEN

In: OCLC (2×).

133.7

The etcher's handbook. Giving an account of the old processes, and of processes recently discovered / Philip Gilbert Hamerton ; illustrated by the author. - [Photom. repr.]. - Freeport, N.Y. : Books for Libraries Press, 1972. - viii, 88, ii, 32 p. : VI pl., [1] fig. ; […] cm.

Contents: p. iii.

Supplier: p. 70.

List of publications by the author: p. 85.

ISBN 0-8369-6976-6

§ Photomechanical reprint of: London 1871 [No. 133.1].

NOT SEEN

133.8

The etcher's handbook. Giving an account of the old processes, and of processes recently discovered / Philip Gilbert Hamerton. - [OCR repr.]. - [S.l.] : General Books, 2009–2010. - 126 p. : 23 cm.

ISBN 0-217-79938-8

ISBN 978-0-217-79938-6

§ The edition cannot be identified.

Unedited OCR scan with all mistakes and without the plates of unknown edition.

General Books is the same company as Million Books Club. The company calls itself a book club and does not give a physical address.
NOT SEEN
In: KVK.

133.9

The etcher's handbook. Giving an account of the old processes, and of processes recently discovered / Philip Gilbert Hamerton. - [OCR repr.]. - [S.l.] : Nabu Press, 2010.
2010. - 126 p. : 23 cm.
ISBN 1-141-07091-X
ISBN 978-1-141-07091-6
§ The edition cannot be identified.
Unedited OCR scan with all mistakes and without the plates of unknown edition.
The company does not give a physical address.
NOT SEEN
In: KVK.

Hardie (Martin)
See: **Goulding** (Frederick) [No. 124].

Hartill (Brenda) & **Clarke** (Richard) 134

Collagraphs and mixed-media printmaking / Brenda Hartill and Richard Clarke. - London : A&C Black, 2005. - 128 p. : [141] ill. in colour ; 23.5 cm. - (Printmaking handbook).
Contents: p. 3.
Literature: p. 119.
Suppliers, p. 120.
URLs: p. 123.
Glossary: p. 124.
Index: p. 128.
ISBN 0-7136-6396-0 (softcover)
ISBN 978-0-7136-6396-0 (softcover)
§ Copyright 2004.
The illustrations are photographs and reproductions.
Lit.: *Printmaking Today*, 12 (2003), 4: 22–23.
Announcement: *Printmaking Today*, 14 (2005) 2: 30.
Review: P. Wray, in *Printmaking Today*, 14 (2005) 3: 30.
1 –
Collagraphy
3 –
Chine Collé / Ink / Paper
5 –
Art History / Conservation and Restoration
In: Priv.Coll.

Hassell 1 (John) 135

Calcographia: or, the art of multiplying, with perfection, drawings after the manner of chalk, black lead pencil, and pen and ink: exemplified by progressive specimens of the various styles which may be produced by this useful invention from drawings by Messrs, Morland, Ibbetson, Clennel, Munn, and Hassell. For which the author was honoured with a medal and thirty guineas by the Society of Arts, &c. &c. &c. To which are added practical illustrations of the art of rebiting to produce strength and effect / by J[ohn] Hassell ; [plates by John Hassell, Mr Clennell, P.S. Munn]. - London : for Sherwood, Neely, and Jones, 1811. - 37 p. : VIII pl. ; 27–29 cm.
Suppliers: pp. 16, 18.
§ Dated, p. 37: 'Jan. 1, 1811'. All prints are dated: 'London, Pub. Feb. 18n by J. Hassell'.
This text is published after Hasse had received his 'premium' (gratuity) of the Society for the Encouragement of Arts, Manufactures, and Commerce on 29 May 1810; titlep., pp. 8–9.
Pl. I is the frontispiece.
Title description after microfilm.
1 –
Aquatint / Crayon Etching / Lift-ground
2 –
Copper
In: BL; *Bridson & Wakeman 1984*: nos. B11, B12; *Hind 1963-1*: 397; *Levis 1912*: 100–101; NSTC 1: no. H818; NUC–1956; OCLC; *Singer & Strang 1897*: no. 90.

Hassell 2 (John) 136.1

Graphic delineation. A practical treatise on the art of etching, or manner of copying pictures & drawings by a method at once scientific, tasteful, & amusing: to which are added, instructions, detailing minutely the whole process of representation, from an outline to a finished print, with directions for making and compounding every article used in the process. Illustrated with plates in progress, of landscape, cattle, and figures, from original works of Claude Lorraine, Rembrandt, Berghem, Ostade, Paul Potter, &c. &c. / by J[ohn] Hassell ; etched by J[ohn] Hassell. - [1st ed.]. - London : printed for W. Simpkin and R. Marshall, sold by J.F. Setchell, also by M. Hassell, the widow, 1826. - 23 p. : front., [8] etch. ; 28.5 cm.
1 –
Line Etching
2 –

Copper
5 –
Art History
In: BL; BLBS; *Bridson & Wakeman 1984*: no. B14; *Hind 1963-1*: 397; *Levis 1912*: 101; NSTC 2: no. 2H11590; NUC–1956; OCLC (4×); Priv.Coll.; *Singer & Strang 1897*: nos. 114, 122.

136.2

Graphic delineation. A practical treatise on the art of etching, or manner of copying pictures & drawings by a method at once scientific, tasteful, & amusing: to which are added, instructions, detailing minutely the whole process of representation, from an outline to a finished print, with directions for making and compounding every article used in the process. Illustrated with plates in progress, of landscape, cattle, and figures, from original works of Claude Lorraine, Rembrandt, Berghem, Ostade, Paul Potter, &c. &c. / by J[ohn] Hassell ; etched by J[ohn] Hassell. - [2nd ed.]. - London : published for M. Hassell, the widow, 1827. - 23 p. : front., [8] etch. ; 29.5 cm.
§ Perhaps there was an edition published in 1829, but references are unclear.
In: *Bridson & Wakeman 1984*: no. B14; *Levis 1912*: 101–102; NUC–1956; OCLC (2×); Priv.Coll.

Hauckwitz (J.)   137

An essay on engraveing and copper-plate printing. To which is added, Albumazar, or the professors of the black art, a vision [in verse] / J. H[auckwitz], copper-plate printer. - London : [s.n.], 1732. - […] p. ; 4º.
§ Could be a manuscript, perhaps a poem.
Although the title sounds authentic and is cited in reference works, no copy has been found in any library catalogue. *Levis*, p. 94: 'I have not been able to find a copy of this book, so can give no details. It is mentioned in the Universal Catalogue of "Books on Art" and in other Bibliographies'; p. 514: 'I have not been able to find a copy, so can merely record the above, which is taken from several earlier bibliographies'. Perhaps a 'ghost'.
NOT FOUND
In: *Blas Benito 1994*: 69; *Hind 1963-1*: 395; *Levis 1912*: 94, 514; *Singer & Strang 1897*: no. 34.

Hayter (Stanley William)   138.1

New ways of gravure / S[tanley] W[illiam] Hayter ; with a preface by Herbert [Edward] Read. - First ed. - London : Routledge & Kegan Paul, 1949. - 275 p. : 125 fig., of which [4] in colour ; 26 cm.
Contents: p. 5.
List of illustrations: p. 7.
Suppliers: pp. 35, 55.
§ The figures are diagams, photographs and reproductions.
For a discussion on the influence of this manual and a pedigree of the manuals by Hayter, Hecht and their followers, see above: Manuals and their Influence – Stanley Hayter, p. 421.
1 –
Aquatint / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Zinc
3 –
Casting / Ink / Leather / Paper / Parchment / Press / Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Monochrome / Printing Polychrome / Relief Printing / Textile / Viscosity Colour Printing
4 –
Screen Printing
5 –
Aesthetics / Art History
In: BL; BLBS; CCB; DBI-VK; GLA; KVB; KB; KBR; MvC; MET; NCC; NUC–1956; OBA; OCLC; Priv.Coll.; RKD; RMA; SMA; UBA; ULC.

138.2

New ways of gravure / S[tanley] W[illiam] Hayter ; with a preface by Herbert [Edward] Read. - [1st ed.]. - New York : Pantheon, 1949. - 275 p. : 125 fig., of which [4] in colour ; 26 cm.
Contents: p. 5.
List of illustrations: p. 7.
Suppliers: pp. 35, 55.
In: *Blas Benito 1994*: 81; NUC–1956; OCLC; UBAB.

138.3

New ways of gravure / S[tanley] W[illiam] Hayter ; with a preface by Herbert [Edward] Read ; [Bibliography compiled by Bernard Karpel]. - [2nd ed.]. - London ; New York ; Toronto : Oxford University Press, 1966. - xxiv, 298 p. : 125 fig., 8 colour pl., [1] folding scheme ; 24.5–25 cm.
Contents: p. vii.
List of illustrations: p. ix.
List of colour plates: p. xv.
Suppliers: p. 12.
Literature: p. 289.
Index: p. 295.
§ The figures are diagrams, photographs and reproductions; the colour plates are reproductions. Scheme opp. p. 159.
Front cover flap: 'it has now been revised and partially rewritten, with the author contradicting some of his original conclusions. ... This is a companion volume to the same author's *About prints* [London 1962].'
Important are the added instructions for viscosity colour printing.
In: BL; *Blas Benito 1994*: 81; CCB; DBI-VK; *Figueras Ferrer 1992*: 1049; KB; NCC; Priv.Coll. (2×); RAA; RAL; UBA (2×); SKI; UBU; ULC.

138.4

New ways of gravure : innovative techniques of printmaking taken from the studio of a master craftsman / Stanley William Hayter ; [preface by Herbert Edward Read]. - [3rd] rev. ed. - New York : Watson-Guptill, 1981. - 302 p. : front., 138 ill., 16 colour pl., [1] scheme ; 25.5 cm.
Contents: p. 9.
List of illustrations: p. 11.

Suppliers: pp. 36, 286.
Literature: p. 290.
Index: p. 296.
ISBN 0-8230-3174-8 (softcover)
§ The chapters on viscosity colour printing and teaching are rewritten. Added are a chapter on photomechanical etching techniques and some theoretical subjects.
The spelling in this edition is in American English.
In: BL; *Blas Benito 1994*: 81; DBI-VK; Priv.Coll.; ULC.

Heath (Charles)
See: **Partington 1** (Charles Frederick) [No. 231].

Hecht (Joseph) 139.1

Traité de gravure / Joseph Hecht ; [ed. by Charles Pranard?]. - [Lodz ; Paris ; Stockholm], [1927–1931]. - [391] fol. ; ill. ; different formats.
§ Title means: Treatise on engraving
Manuscript.
Language: French.
Contains four versions of the same text. The first manuscript version of the treatise is a mere gathering of notes. The second and third manuscript versions have been edited by others, but both are incomplete. The fourth version is an unfinished typescript, corrected by hand.
Part of the editing was probably done by Charles Pranard; **Hecht** (1994) [No. 139.2]: 20–21, 23.
The illustrations are small sketches in between the text.
For a discussion on Hayter's manual and a pedigree of the manuals by Hayter, Hecht and their followers, see above: Manuals and their Influence – Stanley Hayter, p. 421.
Title description after the edition, see [No. 139.2].
NOT SEEN
In: MDEO.

139.2

Traité de gravure / Joseph Hecht ; présentation par Eugène Rouir ; préface de Géo Charles ; préface de Raymond Schwab ; note d' Abram Krol.
Special ed. of: Le livre & l'estampe. - Vol. 40 (1994), no. 141. - P. [13], 14–102 : [1], 23 fig. ; 22.5 cm.
Contents: p. 14.
List of illustrations: p. 16.
Biography of Hecht: p. 29.
MIP: pp. 31–94 : fig. 1–2, 8–11, 13–23.
§ Hecht died in 1951 and his text was published posthumously.
The introduction by Rouir is dated, p. 26: 'octobre 1992'.
Figures 1–2, 8–11, 13–23 show pages from the ms., fig. [1] and 5 are reproductions.
1 –
Drypoint / Line Engraving / Line Etching
2 –
Copper
3 –
Printing in Black / Ink / Paper / Parchment
5 –
Conservation and Restoration / Aesthetics
In: KB; Priv.Coll.; RMA.

Hédou (Jules)
See: **Le Prince** (Jean Baptiste) [No. 182.4]

Heller (Jules) 140.1

Printmaking today : an introduction to the graphic arts / by Jules Heller ; [ill. William A. Motta, illustrator] ; [photogr. Louis Gross, Delmore E. Scott].
- [1st ed.]. - New York [etc.]: Holt, Rinehart and Winston, 1958. - xxii, 266 p. : front., [1] scheme, [1], 41, [1], 26, [1], 61, [1], 23 ill. ; 25.5 cm.
Contents: p. vi.
List of illustrations: p. viii.
Literature at the end of each chapter: pp. 58, 99, 198, 233.
MIP: pp. 101–198 : [1], 61 ill.
Suppliers: p. 240.
Glossary: p. 250.
List of artists and their prints, without page references: p. 258.
Index: p. 261.
SBN 03-005715-9 (hardcover)
§ The acknowledgments are dated, p. v: 'Los Angeles, California November, 1957'.
The illustrations are diagrams, photographs and reproductions.
The recipe for 'Rembrandt's Ground' on p. 126 is copied, without reference, after **Bosse** (Paris 1745) [No. 042.8]: 50.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Aluminium / Copper / Steel / Wood / Zinc
3 –
Ink / Press / Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing

4 –
Linocut / Lithography / Troubleshooting / Screen Printing / Woodcut / Wood Engraving
5 –
Art History
In: Priv.Coll. (2×); ULC.

140.2
Printmaking today : an introduction to the graphic arts / by Jules Heller ; [ill. William A. Motta] ; [photogr. Louis Gross, Delmore E. Scott]. - [1st ed.].
- London : Pitman, 1958. - xxii, 266 p. : front., [1] scheme, 1], 41, [1], 26, [1], 61, [1], 23 ill. ; 25.5 cm.
Contents: p. vi.
List of illustrations: p. viii.
Literature at the end of each chapter: pp. 58, 99, 198, 233.
MIP: pp. 101–198 : [1], 61 ill.
Suppliers: p. 240.
Glossary: p. 250.
List of artists and their prints, without page references: p. 258.
Index: p. 261.
§ The acknowledgments are dated, p. v: 'Los Angeles, California November, 1957'.
The illustrations are diagrams, photographs and reproductions.
In: BL; *Blas Benito 1994*: 81; BLBS; CCB; *Figueras Ferrer 1992*: 1050; KVB; NCC; RAA; SBB; UBA.

140.3
Printmaking today : an introduction to the graphic arts / by Jules Heller ; [ill. William A. Motta, illustrator] ; [photogr. Louis Gross, Delmore E. Scott].
- [2nd ed.]. - New York [etc.]: Holt, Rinehart and Winston, 1966. - xxii, 266 p. : front., [1] scheme, [1], 41, [1], 26, [1], 61, [1], 23 ill. ; 25.5 cm.
Contents: p. vi.
List of illustrations: p. viii.
Literature at the end of each chapter: pp. 58, 99, 198, 233.
MIP: pp. 101–198 : [1], 61 ill.
Suppliers: p. 240.
Glossary: p. 250.
List of artists and their prints, without page references: p. 258.
Index: p. 261.
In: OCLC; Priv.Coll.

140.4
Printmaking today : a studio handbook / Jules Heller ; [ed. Dan W. Wheeler ... et al.]; [photogr. Louis Gross, Delmore E. Scott]. - Second [sic! = 3rd]
ed., first printing. - New York [etc.] : Holt, Rinehart and Winston, [1972]. - viii, 344 p. : 346 fig., 45 colour pl. ; 25.5–26 cm.
Contents: p. vii.
MIP: pp. 183–266 : fig. 193–286, pl. 30–38.
Workshops, equipment and materials: p. 303–327.
Suppliers: p. 330.
Films related to prints and printmakers: p. 332.
Literature: p. 333.
Glossary: p. 336.
Index: p. 339.
ISBN 0-03-091403-5 (trade edition, softcover)
ISBN 0-03-073585-8 (college edition, hardcover)
§ The text is completely rewritten, pp. V–VI.
The preface is dated, p. vii: 'Toronto, Canada January 1972'.
The figures are diagrams, photographs and reproductions, the plates are reproductions.
1 –
Aquatint / Collagraph / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Aluminium / Copper / Plastic / Zinc
3 –
Blind Embossment / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing /
Viscosity Colour Printing
4 –
Digital Printmaking / Linocut / Lithography / Troubleshooting / Screen Printing / Wood Engraving / Woodcut
5 –
Art History
In: *Blas Benito 1994*: 81; CCB; DBI-VK; NCC; OCLC; Priv.Coll. (3×); UBA; ULC.

Hendriks (Arend)   141
Etsen : handleiding voor het etsen op koper en zink / door Arend Hendriks. - Alkmaar : Arti, [1944]. - 44, [31] p. : [9] diagrams, 7, 16 ill. [5] details,
[1] diagram ; 30 cm.
Contents: p. 3.
With literature.
§ Title means: Etching: manual for etching on copper and zinc
1 –
Aquatint / Drypoint / Line Etching / Soft-ground
2 –
Copper / Zinc

3 –
Paper / Press / Printing in Black
4 –
Troubleshooting
5 –
Aesthetics
In: CCB; ENS (2×); GBR; GDH; GLA; KABK; KB; NCC; NUC–1956; OBA; PBL; PBM; Priv.Coll. (3×); RAA; RMA; SBH; TUT; UBA (3×); UBU.

Henrici (Moritz)   142

Die Kupferstecherkunst und der Stahlstich / Moritz Henrici. - Leipzig : Verlag der J.C. Hinrichsen Buchhandlung, 1834. - IV, 168 p. ; 18.5 cm.
MIP: pp. 25–66, 157–168.
Literature: p. 51.
Addenda & corrigenda: p. 168.
§ Title means: The art of engraving and steel engraving
Although not strictly a practical manual, Henrici's technical information is sufficiently detailed to select this book for the present bibliography.
Intended audience, title page: 'Für Männer vom Fach und Kunstfreunde'.
Announcement: *Journal für Buchdruckerkunst, Schriftgießerei und die verwandten Fächer*, 1 (1834) 5: col. 110.
Review: *Journal für Buchdruckerkunst, Schriftgießerei und die verwandten Fächer*, 1 (1834) 6: col. 116–122.
See also: **Henrici** (1834) [No. 477].
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Échoppe / Line Engraving / Line Etching / Mezzotint / Ruling Machine / Stipple Engraving
2 –
Copper / Steel
3 –
Ink / Multiple-plate Printing / Paper / Parchment / Textile
5 –
Aesthetics / Art History
In: *Börsenverein 1885*; DBI-VK; KSM; *Singer & Strang 1897*: no. 137; UBG.

Herkomer (Hubert)   143

Etching and mezzotint engraving : lectures delivered at Oxford / by Hubert [von] Herkomer. - London ; New York : Macmillan, 1892. - viii, 107 p. : front., 12 pl. ; 31.5–32 cm.
Contents: p. v.
List of illustrations: p. vii.
Suppliers: pp. 59, 82.
§ The texts of two lectures given at Oxford, without date.
Review: *The Art-Journal*, new series (1892): 127.
1 –
Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Monotype
2 –
Copper / Steel / Steelfacing
3 –
Printing in Black / Ink / Paper / Press
5 –
Aesthetics / Art Dealing / Art History / Original and Reproduction
In: BL; *Blas Benito 1994*: 69; BLBS; *Bridson & Wakeman 1984*: nos. B37, B45; *Figueras Ferrer 1992*: 1050; *Levis 1912*: 109; MET; OCLC; RAL; RMA; SBB; *Singer & Strang 1897*: no. 376; UBAB; UBH; ULC.

Hesketh (Eric)
See: **Hubbard 1** (Eric Hesketh) [No. 153].
See: **Hubbard 2** (Eric Hesketh) [No. 154].

Hidalgo (José García)
See: **García Hidalgo** (José) [No. 115].

Hilpke (Heinz)   144.1

Handbuch der Graveure, Ziseleure und Gürtler : Material, Werkzeuge und Arbeitsmethoden / Heinz Hilpke. - Stuttgart : Rühle-Diebener, 1956. - 1. Aufl. - 214, [12] p. : 176 Abb. : 20.5 cm.
Contents: p. 7.
MIP: pp. 98–101.
Index: p. 205.
Advertisement: pp. [3]–[11].
§ Title means: Manual for engravers, chasers and buckle makers: material, tools and working methods
The preface is dated, p. 6: 'Im November, 1956'.
The *Abbildungen* are diagrams and photographs.
Intended audience, p. 5: 'dem Meister, Gesellen, und Lehrling'.
1 –
Line Engraving / Line Etching
2 –

Copper / Gold / Iron / Silver / Zinc
4 –
Goldsmithing
5 –
Art History
In: Priv.Coll.

144.2

Handbuch der Graveure, Ziseleure und Gürtler : Material, Werkzeuge und Arbeitsmethoden / Heinz Hilpke. - Stuttgart : Rühle-Diebener, 1956. - 1. Aufl. [sic!]. - 214, [12] p. : 176 Abb. : 20.5 cm.
Contents: p. 7.
MIP: pp. 98–101.
Index: p. 205.
Advertisement: pp. [1]–[10].
§ The text is identical to the other issue, with different advertisements and a different commercial binding.
In: Priv.Coll.

Hoberg (Reinhold)   145.1

Die graphischen Techniken und ihre Druckverfahren. Eine Darstellung / von Reinhold Hoberg ; [diagrams by Reinhold Hoberg, Alfred Kubin and Max Pechstein] ; Rötel-Lithographie des Einbands von Hans Meid. - Vorzugsausg. - Berlin : Fritz Gurlitt, 1922. - 175 p. : ill. ; […] cm.
Edition: 1,000 numbered copies.
§ Title means: The graphic techniques and their manners of printing. An explanation
Printer: Otto v. Holten.
Two issues of this edition appeared, DNB-F: 'Vorzugsausg. A mit 150 Orig. Graphiken, Pergbd.: 800.-; B mit 6 Orig. Graphiken, Hlwbd.: 200.-'.
NOT SEEN
In: DNB-F; *Figueras Ferrer 1992*: 1050; NUC–1956.

145.2

Die graphischen Techniken und ihre Druckverfahren. Eine Darstellung / von Reinhold Hoberg ; [diagrams by Reinhold Hoberg, Alfred Kubin and Max Pechstein] ; Rötel-Lithographie des Einbands von Hans Meid. - Berlin : Fritz Gurlitt, 1923. - 206, [2] p. : [104] ill. ; 26.5 cm. - (Das graphische Jahr / Fritz Gurlitt ; 2)
MIP: pp. 17–71 : [44] ill.
Stocklist: p. 177.
With addenda & corrigenda
§ The illustrations are diagrams and reproductions.
P. [2]: 'Neben dieser [= 1923] Auflage wurde eine Vorzugsausgabe in Tausend numerierten Exemplaren auf bestem, holzfreim Papier bei Otto v. Holten im Herbst 1922 gedruckt. Die ersten fünfzig Exemplare sind in Ganz-Pergament gebunden und enthalten fünfzehn handschriftlich signierte Original-Graphiken. Die übrigen Exemplare sind in Halbleinen gebunden und enthalten sechs, ebenfalls signierten Original-Graphiken. Druckleitung: Paul Eipper'.
Largely descriptive with instructive elements.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steelfacing / Zinc
3 –
Printing in Black
4 –
Monotype / Screen Printing / Woodcut / Wood Engraving
5 –
Aesthetics / Art History
In: BL; *Blas Benito 1994*: 81; BLBS; CCB; DBI-VK; NCC; NSUG; OCLC; Priv.Coll.; SBB; SMA; UBA (2×); UBH; UBLz; UBU.

Hodson 1 (Thomas)   146.1

The accomplished tutor; or, complete system of liberal education: containing the most improved theory and practice of the following subjects: 1. English grammar and elocution. 2. Penmanship and shorthand. 3. Arithmetic vulgar and decimal. 4. Stock-holding and merchants-accompts. 5. Mensuration and architecture. 6. Optics. 7. Algebra. 8. Doctrine of annuities. 9. Trigonometry. 10. Logarithms. 11. Geography. 12. Astronomy. 13. Mechanics. 14 Electricity. 15. Pneumatics. 16. Hydrostatics. 17. Hydraulics. 18. Drawing, Engraving, and Painting. And other useful matter / by Thomas Hodson. - London : printed for the author [Thomas Hodson], sold by Vernor and Hood, Wright, Sael, and Symonds, 1800. - 2 vol. : 20 pl., 6 maps ; 21 cm.
Title description after microfiche of vol. 2 only.
– Vol. 1: […] p. : 9 pl.
– Vol. 2: VIII, 458 p. : pl. 9–XXIII.
Contents: p. III.
MIP: pp. 408–430.
§ Plates have Arabic and Roman numerals, some are not numbered.
1 –
Aquatint / Crayon Etching / Drypoint / Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Multiple-plate Printing / Printing à la Poupée / Printing Polychrome
4 –
Drawing / Painting

5 –
Aesthetics / Art History / Original and Reproduction
In: ESTC: no. t121347 (5×); ULC (2×).

146.2

The accomplished tutor; or, complete system of liberal education ... [etc.] / by Thomas Hodson. - [2nd ed.]. - London : printed for the author [Thomas Hodson], sold by Vernor and Hood, Wright, Sael, and Symonds, 1802. - 2 vol. : 20 pl., 6 maps ; 20–21 cm.
§ COPAC: 'Frontispiece in v. 1 engraved by S. Springsguth after a drawing by R. Corbould ; other engravings by Roper or V. Woodthorpe.'
NOT SEEN
In: BL; BLO; COPAC; NSTC: no. H2067; OCLC.

146.3

The accomplished tutor; or, complete system of liberal education ... [etc.] / by Thomas Hodson. - [3rd ed.]. - London : printed for H. D. Symonds, and Vernor, Hood, and Sharpe, Poultry, 1806. - 2 vol. : 20 pl., 6 maps, some folded ; 21–22 cm.
§ BLO: 'Frontispiece plate in v.1 only, dated Jan.1 1804. Instructions to the binder on final leaf in v.2, for the placement of the 26 plates (8 in v.1; 18 in v.2). Advertisements on final page in v.2. Printer statement on t.p. verso "S. Gosnell, printer, Little Queen Street, Holborn".'
– Vol. 1: viii, 470 p. : ill.
– Vol. 2: viii, 458, [2] p. : ill.
NOT SEEN
In: BL; NSTC: no. H2067; OCLC.

Hodson 2 (Thomas)   147

NB: this title is entered under the name of the first-mentioned author Thomas Hodson, because the authors change in the course of the editions.
See also: **Dougall** (1801) [No. 081].

147.1

The cabinet of the arts; being a new and universal drawing book, forming a complete system of drawing, painting in all its branches, etching, engraving, perspective, projection, & surveying, with all their various & appendant parts. Containing the whole theory and practice of the fine arts in general from the first elements to the most finished principles displaying in the most familiar manner the whole rudiments of imitation, design, desposition, invention & deception. To which is added an appendix, containing several curious and usful miscellaneous articles / by T[homas] Hodson & J[ohn] Dougall. - London : T. Ostell, 1805. - [10], 367 p. : 67, [1] pl. ; 28 cm.
Contents: p. [7].
MIP: pp. 110–132, 362.
With literature.
§ Preface dated, p. [6]: 'London, 1st October, 1805'.
Yale Center for British Art: 'First published, 1804, with title: The index to the arts'; but not certain whether this actually is a first edition. The relationship between the different editions is unclear.
Title description after microfilm.
1 –
Aquatint / Crayon Engraving / Drypoint / Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Hand-colouring / Multiple-plate Printing / Printing Polychrome
4 –
Drawing / Painting
5 –
Aesthetics / Art History
In: *Bridson & Wakeman 1984*: no. B10; *Levis 1912*: 91; NUC–1956; OCLC; *Singer & Strang 1897*: no. 82.

147.2

The cabinet of arts, or, general instructor in arts, science, trade, practical machinery, the means of preserving human life and political economy, embracing a variety of important subjects / by Hewson Clarke and John Dougall. - London : T. Kinnersley, 1817. - 859 p. : ill. ; 22 cm.
MIP: Chapter VI.
§ *Bridson & Wakeman*: 'comprises a reprint of the 1805 text with the addition of a chapter on lithography. pp. 373–384 & lith. pls.'
Yale Center for British Art: 'The 2d ed. was edited by John Dougall.'
Levis: 'Chapter VI deals with the subject of engraving, and is exactly like (page for page) the same chapter in the 1838 edition next noted.'
NUC–1956: 'The chapters on architecture, painting and engraving are for the most part the same as books 2–4 of "The cabinet of the arts, being a new and universal drawing book", ed. by T. Hodson, in 1805.'
1 –
Aquatint / Crayon Engraving / Line Etching / Mezzotint
4 –
Lithography / Wood Engraving
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B10; BL; *Levis 1912*: 91; NSTC: no. D1623 (under: Dougall); NSTC 2: no. 2C24217; NUC–1956; OCLC.

147.3

The cabinet of the arts; being a new and universal drawing book, forming a complete system of drawing, painting in all its branches, etching, engraving, perspective, projection, & surveying; with all their various & appendant parts, containing the whole theory and practice of the fine arts in general from the first elements to the most finished principles, displaying in the most familiar manner the whole rudiments of imitation, design, disposition, invention & surveying / John Dougall. - Second ed. with additions - London : R. Ackermann, [1821]. - 2 vol. : ill. ; 4º.
– Vol. 1: iii, [v], 384, [4] p. ; front., engr. titlep.
With index.
§ The preface is dated: '1st Aug. 1821'.
Text only.

Enlarged with an article on lithography.
Also found paged: [2], iv, 384, [4] p.
– Vol. 2: front., engr. titlep., 122 [= 126], [5] pl., a number of pl. with hand-colour
§ Plates only.
The plates are numbered 1–101, 97–120, 120, 122. The plates are 79 soft-ground etchings, 12 uncoloured aquatints, 5 coloured aquatints, 5 lithographs, 26 plates printed in colour and finished by hand.
1 –
Aquatint / Crayon Engraving / Drypoint / Line Engraving / Line Etching / Mezzotint
4 –
Lithography
NOT SEEN
In: BL; NLA; NSTC 2: no. 2D17409; NUC–1956; ULC; V&A.

147.4

The cabinet of arts or general instructor in arts, science, trade, practical machinery, the means of preserving human life and political economoy, embracing a variety of important subjects / by Hewson Clarke and John Dougall. - London : J. M'Gowan & Son, [1825?]. - 859 p. ; ill., of which [1] folded ; 22 cm.
NOT SEEN
In: BLO; NSTC 2: no. 2C24217 ('Missing'); NUC–1956; OCLC.

147.5

The cabinet of arts or general instructor in arts, science, trade, practical machinery ; the means of preserving human life ; political economy, and a variety of other important subjects / by Hewson Clarke. - London : printed by John M'Gowan, 1838. - [6], 859, [1] p. : 10 pl., of which [1] folded ; 22–23 cm.
MIP: pp. 429–443.
1 –
Aquatint / Crayon Etching / Line Etching / Mezzotint
4 –
Wood Engraving
NOT SEEN
In: BL; *Levis 1912*: 91–92; NSTC 2: no. 2C24217; OCLC.

Hoe Jr. (Robert)
See: **Fielding** (Theodore Henry Adolphus) [No. 100.4].

Holleman (Marius)   148.1

Nieuwe etstechnieken en een nieuwe schilderstechniek / door Marius Holleman. - Groningen, May 1920–1925. - 3 vol. : ill.
§ Title means: New etching techniques and a new painter's technique
Manuscript.
Language: Dutch.
Only the techniques on etching have been published, not the part on the new painting technique.
Lit.: *Spijk & Hofsteenge 1996*, pp. 42–56.
Title description after KB copy.
– Vol. 1: Nieuwe etstechnieken en een nieuwe schilderstechniek / [with notes for the printer by Nicolaas Gerardus van Huffel]. - May 1920. - 96 fol. ; 31.5 cm.
§ Two copies known, of which the text is identical, just the number of pages differ.
Title page copy KB: 'Manuscript, volledig, bestemd om naar den drukker te gaan en daarna ten geschenke gegeven te worden aan de Koninklijke Bibliotheek te 's Gravenhage.'
Title page copy UBG: 'Manuscript, volledig, bestemd om ten geschenke gegeven te worden aan de bibliotheek der Rijksuniversiteit te Groningen.'
– Vol. 2: [First and second supplement] / [with notes for the printer by Nicolaas Gerardus van Huffel]. - 1920, 1921. - 55 fol. : 12 etch. ; 31.5 cm.
– Vol. 3: [Other supplements]. - 1922, 1924, 1925. - 16 fol. ; 30.5 cm.
§ The first 16 pages written.
Loose sheets in various formats bound together; the measurement of the largest sheet is given.
1 –
Aquatint / Crayon Etching
2 –
Copper
3 –
Multiple-plate Printing / Printing in Black / Printing Polychrome / Textile
4 –
Painting
In: KB, Ms. 135 F 21; UBG, HANDS ADD 314 (NOT SEEN).

148.2

Nieuwe etstechnieken / bedacht en beschreven door wijlen Marius Holleman ; gedeeltelijk hier in druk gegeven en van verklarende bijschriften voorzien door N[icolaas] G[erhardus] van Huffel ; etsen van Marius Holleman ; afgedrukt van diens nagelaten koperplaten door J.W. Nortier. - Utrecht : Van Huffel, 1927. - [1] vol. and [7] sheets in folder : ill. ; 25.5 & 31.5 cm.
Edition: 50 copies.
§ Title means: New etching techniques
The manuscript was written in Groningen in May 1920, title page: 'Geschreven te Groningen in de maand mei van het jaar negentien honderd en twintig.' For the manuscript see: Groningen 1920–1925 [No. 148.1].
Holleman died in 1926 and his text was published posthumously.
The copy UBL-KHI is extra large (height 31.5 cm) and bound in two volumes with five extra etchings. It was probably a presentation copy.

The copy RMA and one of the copies ENS (no. 36) are still accompanied by one of Holleman's copper plates each. It was the intention that all other copper plates would go to the Printroom of the Leyden University, but that did not happen. The rest of the plates were offered for sale together with his inventory after his death and they have all disappeared.

Review: J.J. de Gelder, 'Holleman's nieuwe etstechnieken', in *Nieuwe Rotterdamsche Courant* (1928) (6 Feb., evening issue): 2.

Lit.: *Spijk & Hofsteenge 1996*: 42–57.

– Vol. 1: [Text]. - 42, [1] p. : [1] etch. pasted on the front cover, [1] facsimile + [1] loose sheet.

Supplier: p. 12.

§ The facsimile (p. 9) is the *Voorbericht* (preface) of the ms. by Holleman.

– Vol. 2: [Etchings]. - 7 etch. + list of prints.

§ The etchings are specimens of the techniques Holleman invented.

Etching on cover = Spijk 437; no. 1 = Spijk 361; no. 2 = Spijk 422; no. 3 = Spijk 380; no. 4 = Spijk 362; no. 5 = Spijk 358; no. 6 = Spijk 255; no. 7 = Spijk 345. UBL-KHI has five extra etchings: Spijk 307, 323, 351, 399, 424.

For the Spijk numbers see *Spijk & Hofsteenge 1996*: 82–99.

1 –

Aquatint / Crayon Etching

2 –

Copper / Textile

3 –

Multiple-plate Printing / Printing in Black / Printing Monochrome / Printing Polychrome

5 –

Art History

In: MBvB; ENS (2×); NCC; NUC–1956, LC; NYPL; OBA; OCLC; Priv.Coll. (5×); RAA; RMA; SBB; UBA (2×); UBL-KHI; UBU; V&A.

Hollenberg 1 (Felix) 149.1

Radierung : Ätzkunst und Kupfertiefdruck. Ein Handbuch / von Felix Hollenberg ; bearbeitet von Walter Rabe ; [introd. by Gerhard Gollwitzer]. - [1st ed.]. - Ravensburg : Maier, 1962. - 119, VIII p. : 40 Abb., 8 Taf. ; 20 cm.

Contents: p. 3.

§ Title means: Etching: the art of etching and intaglio printing

Hollenberg died in 1945 and this concise version of his text was published posthumously, p. 5: 'In Hollenbergs Nachlaß fand sich das vorliegende Lehrbuch der Radierung. ... Ein junger Nachfolger, Walter Rabe, hat es vorsichtig bearbeitet und ergänzt und damit auf den heutigen Stand gebracht.' See also: **Hollenberg 2** (München 2008) [No. 150]: 212.

1 –

Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Etching / Mezzotint / Soft-ground / Stipple Engraving

2 –

Copper / Steel / Zinc

3 –

Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome

4 –

Monotype

In: ABK; *Blas Benito 1994*: 81; DNB-F; DBI-VK; DNB-L; NCC; NSUG.

149.2

Radierung : Ätzkunst und Kupfertiefdruck. Ein Handbuch / von Felix Hollenberg ; bearbeitet von Walter Rabe ; [introd. by Gerhard Gollwitzer]. - 2. Aufl. - Ravensburg : Maier, 1970. - 120, VIII p. : 40 Abb., 8 Taf. ; 20 cm.

Contents: p. 3.

Index: p. 119.

ISBN 3-473-61107-7

In: DNB-F; DBI-VK; OCLC.

149.3

Radierung : Ätzkunst und Kupfertiefdruck. Ein Handbuch / von Felix Hollenberg ; bearbeitet von Walter Rabe ; [introd. by Gerhard Gollwitzer]. - 3. Aufl. - Eitorf : Gerstacker, 1976. - 122, VIII p. : 40 Abb., 8 Taf. ; 20 cm

§ Edition licensed by Maier.

NOT SEEN

In: DNB-F; DBI-VK; DNB-L.

149.4

Radierung : Ätzkunst und Kupfertiefdruck. Ein Handbuch / von Felix Hollenberg. - 4. Aufl. - Eitorf : Gerstacker, 1980

NOT SEEN

In: DBI-VK.

Hollenberg 2 (Felix) 150.1

[Notebooks on intaglio printmaking] / Felix Hollenberg. - Berlin, 1915–1945. - 5 vol. : ill.

§ Manuscript.

Language: German.

'Dem Künstler dienten drei kleinformatige Notizhefte, die sogenannten "Merkbücher für Ätzkunst" zur Niederschrift. Darüber hinaus existiert ein Schulheft aus dem Jahr 1942, mit dem Titel "Radierungen, Platten, Drucke, Technik" und dem Vermerk "wichtig". Dazu gibt es ein Heft mit schwarzem Leinenrücken zur "Radiertechnik", mit Notizen zum Drucken und zum Papier'. 'Diese beschriebenen ausfürlichen Exzerpte und Notizen zur Technik der Radierung in den drei Merkbüchern bilden die Vorstufe und Grundlage für das vorliegende, eigentliche "Handbuch für Malerradierer"'; **Hollenberg 2** (München 2008) [No. 150.3]: 14–19, see also pp. 188–200.

In addition to his notebooks, Hollenberg created a series of etchings as specimens of the various etching techniques; **Hollenberg 2** (München 2008) [No. 150.3]: 27–39.

Title description after the edition München 2008.

– Vol. 1: Merkbuch für Ätzkunst. I. - 1915–1926. - 97 fol. : ill. ; 19 cm.
§ Title means: Notebook on the art of etching 1
With additions dated 1913–1928.
Contains excerpts from manuals from the 17th to the19th century and personal notes on etching and intaglio printing, such as on the creation of his own works.
– Vol. 2: Merkbuch für Ätzkunst. II. Mit Register. - 1920–1935. - 136 p. : ill. ; 17 cm.
With index.
§ Title means: Notebook on the art of etching 2. With index
Mainly on etching fluids, with notes on the creation of his own works.
– Vol. 3: Merkbuch für Ätzkunst. III. - 1935–1945. - 144 fol. : ill. ; 19 cm.
With index.
§ Title means: Notebook on the art of etching 3
Mainly on intaglio printing and steelfacing, with further excerpts on aquatint and liquid ground.
– Vol. 4: Radiertechnik. II : Drucken Papier etc. - 1925. - […] fol. : ill. ; 22.5 cm.
§ Title means: Etching technique 1 : printing, paper, etc.
Contains extensive information on the Japanese papers Hollenberg owned.
– Vol. 5: Radierungen, Platten, Drucke, Technik. - 1942. - […] fol. : ill. ; 21 cm.
§ Title means: Etchings, plates, prints, technique
Contains notes on intaglio printing intended for the future manual, but they were not entered into the typescript.
NOT SEEN
In: SK-GA.

150.2

[Handbuch für Malerradierer] / Felix Hollenberg. - [Berlin]: [Hollenberg], 1936–1941.
§ Typescript.
Language: German.
Hollenberg 2 (München 2008) [No. 150.3]: 41, 'Der Text des Handbuches für Malerradierer von Felix Hollenberg entstand ab 1917 und wurde in den Jahren 1936 und 1941 überarbeitet. Ein erhaltenes Typoskript illust[r]ierte der Künstler zusätzlich mit erklärenden Skizzen'.
This typescript was the basis of the publication, see: München 2008.
NOT SEEN
In: SK-GA.

150.3

Handbuch für Malerradierer : das Radieren, die Ätzkunst, der Kupferdruck / Felix Hollenberg ; hrsg. von Anette Michels; mit Beiträgen von Veronika Mertens und Claudia Schönjahn. - 1. Aufl. - München ; Berlin : Deutscher Kunstverlag, 2008. - 232 p. : 81 fig. ; 26 cm.
Contents: p. 5.
Contents of the manual: p. 42.
MIP: pp. 44–182.
Literature: p. 218.
Index: p. 223.
ISBN: 978-3-422-02148-8 (hardcover)
§ The figures are diagrams and reproductions.
Based on a typescript, p. 41: 'Der Text des Handbuches für Malerradierer von Felix Hollenberg entstand ab 1917 und wurde in den Jahren 1936 und 1941 überarbeitet. Ein erhaltenes Typoskript illust[r]ierte der Künstler zusätzlich mit erklärenden Skizzen. Sie wurden für diese Ausgabe vollständig übernommen, stellenweise ergänzt mit Zeichnungen aus seinen Merkbüchern'.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Press
4 –
Monotype
In: KVB; Priv.Coll.

Holopainen (Kari)
See: **Eskola** (Taneli) **& Holopainen** (Kari) [No. 094].

Howard (Keith)   151.1

Non-toxic intaglio printmaking / by Keith Howard ; forward [sic!] by Monona Rossol ; contributions from Elizabeth Dove, Steve Hoskings & Roy Pearce, Friedhard Kiekeben, Michael Dicky, George Roberts, Monona Rossol. - Grande Prairie, Alberta (Ca.) : Printmaking Resources, 1998. - xi, 248 p. : [437] ill., of which [20] in colour ; 28 cm.
URLs: inside front bookcover, p. 243, and spread throughout the text.
Contents: p. v.
MIP: 1–60, 181–222.
Suppliers: p. 243.
Literature: p. 246.
Index: p. 247.
ISBN 0-9683541-0-6 (softcover)
§ Review: *Printmaking Today*, 7 (1998) 3: 21.
See also: **Howard 1** (1993) [No. 481]; **Howard 2** (1994) [No. 482]; **Howard 3** (1994) [No. 483]; **Howard 4** (1995) [No. 484].
1 –

Aquatint / Crayon Etching / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Aluminium / Brass / Copper / Photopolymer Film / Plastic / Steel / Zinc
3 –
Multiple-plate Printing / Paper / Press / Printing in Black / Printing Polychrome
4 –
Monotype / Lithography
5 –
Art History / Conservation and Restoration / Health and Safety
In: KVK; Priv.Coll. (2×).

151.2

The contemporary printmaker : intaglio-type & acrylic resist etching / by Keith [John] Howard ; contributions from Friedhard Kiekeben, David Jay Reed, Elizabeth Dove, Monona Rossel. - [2nd augm., rev. ed.]. - Rochester, NY : White-Cross Press, 2003. - XIII, 243 p. : ill. ; 28 cm.
Contents: p. V.
Glossary: p. VIII.
Supplier, p. 237.
Literature: p. 242.
ISBN 0-9741946-0-3 (softcover)
§ Completely rewritten and extended, but based on the same materials and techniques as the first edition.
Review: A. Bytautas, in *Printmaking Today*, 13 (2004) 1: 28.
In: KVK; Priv.Coll.

Huband (Wilcocks)   152.1

Critical and familiar notices on the art of etching upon copper : through which are interspersed some prints : an essay on the art of etching upon copper / etched by an amateur [Wilcocks Huband]. - [1st ed.]. - Dublin : Wilcocks Huband, 1810. - 26 p. : 6 prints, 7 ill. ; 21 cm.
Edition: 25 copies.
§ *Levis*: 'Written, printed, engraved, and bound by the author. Much abridged from the original MS.'
1 –
Line Etching
2 –
Copper
NOT SEEN
In: BM, Dep. of Prints and Drawings; *Levis 1912*: 99; NSTC 1: no. H2883; NUC–1956; OCLC (2×);

152.2

Critical and familiar notices on the art of etching upon copper : through which are interspersed some prints : an essay on the art of etching upon copper / etched by an amateur [Wilcocks Huband]. - Repr. - Dublin : Wilcocks Huband, [1813]
Edition: 30 copies.
§ *Levis*: 'reprinted with additions'.
NOT SEEN
In: *Levis 1912*: 99; NSTC 1: no. H2883.

152.3

Critical and familiar notices on the art of etching upon copper : through which are interspersed some prints : and to which is prefixed, an elementary discourse on judgment in the fine arts ; with an appendix / etched by an amateur [Wilcocks Huband]. - 2nd [sic!] ed. and to which is prefixed, an elementary discourse on judgement in the fine arts ; with an appendix. - Dublin : Wilcocks Huband, 1823. - 60 p. : 9 pl. ; 25 cm.
§ Oplage, OCLC: 'Twelve copies reprinted, with additions, by A. O'Neil.'
With prints by the author or his son Joseph Huband.
NOT SEEN
In: LC; OCLC; UM.

Hubbard 1 (Eric Hesketh)   153.1

On making & collecting etchings : a handbook for etchers, students and collectors / written by members of The Print Society ; and put together and ed. by E[ric] Hesketh Hubbard ; [preface by Eric Hesketh Hubbard]. - [1st ed.]. - London : The Morland Press ; Ringwood : The Print Society, 1920. - 186, [8] p. : 10 ill., A-E diagrams ; 23–24 cm. - (Print Society Publications ; 1).
Contents: p. 6.
List of illustrations: p. 7.
Addenda & corrigenda: between pp. 8 and 9.
Literature: p. 137.
Index: p. 169.
Advertisement: p. [1].
§ The authors are Mathew Henderson, Edward Ertz, E.W. Charlton, Percy Smith, Stella Langdale, Hugh Paton, Reginald H. Green, Leslie M. Ward and Eric Hesketh Hubbard.
The illustrations, inclusive the frontispiece, are numbered in the list '1'-'10'. They are eight reproductions, one etching (the frontispiece) and a mezzotint. The six diagrams are numbered in the list 'A, B, C-i, C-ii, D, E'. The illustrations and diagrams themselves are not numbered.
Interesting is the annotated list of 'Books about etching and collecting' (pp. 143–155), with a detailed subject index (pp. 156–159), and a 'List of periodicals in English containing matter of interest to etchers and collectors of etchings' (p. 160).
1 –
Aquatint / Drypoint / Line Etching / Mezzotint / Monotype / Soft-ground
2 –
Copper / Gelatin / Steel / Steelfacing / Zinc
3 –

Paper / Press / Printing in Black / Printing Monochrome
5 –
Aesthetics / Art History
In: BL; BLBS; CCB; GBR; NUC–1956; OBDH; OCLC; RAL; TM; TUD; ULC.

153.2

On making & collecting etchings : a handbook for etchers, students and collectors / written by members of The Print Society ; and put together and ed. by E[ric] Hesketh Hubbard ; [preface by Eric Hesketh Hubbard]. - Repr. [2nd ed.] with additional notes. - Woodgreen Common, Breamore, Hampshire : The Print Society ; London : Batsford, 1923. - 183, [13] p. : 10 ill., 6 diagrams ; 23 cm. - (Print Society Publications ; 1).
Contents: p. 4.
List of illustrations: p. 5.
Literature: p. 137.
Index: p. 169.
Advertisement: p. [5].
With addenda & corrigenda.
§ With a new preface by Hubbard.
Dated, p. 2: 'Reprinted with additional notes January, 1923.'
The text is not corrected, but additions and corrections are printed on inserted slips.
The ten illustrations are nine reproductions and one etching. The illustrations and diagrams are numbered in their lists, as in the first edition, but are not individually numbered.
In: BL; BLBS; MET; NUC–1956; OCLC; UBL; ULC.

153.3

On making & collecting etchings : a handbook for etchers, students and collectors / written by members of The Print Society ; and put together and ed. by E[ric] Hesketh Hubbard ; [preface by Eric Hesketh Hubbard]. - Repr. [2nd ed.] with additional notes. - Woodgreen Common, Breamore, Hampshire ; New York : Boni & Liveright, 1923. - 183 p. : 10 ill., 6 diagrams ; 22.5 cm. - (Print Society Publications ; 1).
Contents: p. 4.
List of illustrations: p. 5.
Literature: p. 137.
Index: p. 169.
With addenda & corrigenda.
§ With a new preface by Hubbard.
Dated, p. 2: 'Reprinted with additional notes January, 1923.'
The text is not corrected, but additions and corrections are printed on a bifolium inserted between pp. 2 and 3.
The ten illustrations are nine reproductions and one etching. The illustrations and diagrams are numbered in their lists, as in the first edition, but are not individually numbered.
This version does not contain the advertisements.
In: OCLC; Priv.Coll.

Hubbard 2 (Eric Hesketh)   154.1

The craft of etching / by [Eric] Hesketh Hubbard. - London : Winsor & Newton, 1931. - 49 p. : front., 12 fig., tab. ; 22 cm. - (Winsor & Newton's art manuals ; 62).
Contents: p. 3.
List of illustrations: p. 4.
Literature: p. 45.
Index: p. 46.
§ The frontispiece is an etching by Hubbard.
Apparently a 'Special Library Edition' and a 'trade edition' were issued, but the differences between the two are not clear.
Title description after photocopy.
1 –
Aquatint / Drypoint / Line Etching / Mezzotint / Soft-ground
3 –
Multiple-plate Printing / Ink / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Monotype / Photography / Troubleshooting
5 –
Art History
In: BL (2×); BLBS; COPAC; NUC–1956; OCLC.

154.2

[…] / by Eric Hesketh Hubbard ; transl. by James Emmons. - Paris : Skira ; London : Winsor & Newton, 1960. - […] p. : [1] etching ; […] cm.
§ French translation of the edition: London 1931.
No other references found; perhaps it concerns another, unrelated publication, may be a 'ghost'.
NOT SEEN
In: offered for sale by Payson Hall Books, Watertown, MA (c. 2005).
Hubbard (Thomas)
See: **Valuable secrets** [No. 342].

Hübener (Maximilian)   155

Lehrbuch der Gravierkunst / von Maximilian Hübener. - Leipzig : Diebener, 1916. - 312 p. : 90 Abb., XX Taf. ; 29–29.5 cm.
Contents: p. 5.
MIP (engraving): pp. 18–29, 47–49.
MIP (general): pp. 92–104.

MIP (etching): pp. 150–154, 187.
MIP (drypoint): pp. 157–158, 187.
MIP (casting and printing): pp. 178–181.
Illustrations: pp. 243–284.
Index: p. 285.
Index to advertisements: p. 292
Courses: p. 293.
Advertisement: p. 297.
§ Title means: Manual for engraving
Copyright dated, p. 4: '1915'. Preface dated, p. 11: 'Berlin, im Frühjahr 1914.'
Intended audience, p. 9: 'dem Graveur und allen, denen die Kenntnis des Gravierens von Nutzen sein Kann'.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Casting / Printing in Black
4 –
Goldsmithing
5 –
Art History
In: CCB; DBI-VK; KB; DBSM; IBK 1978, 14 (1915–1916): no. 3181; NCC; NUC–1956; OBDH; OCLC; Priv.Coll.; RMA; SBB; SBH; UBA; UBL-KHI.

Hülsmann (Alf)　　　156

Radierungen. Grundlegende Techniken und gestalterische Möglichkeiten / Alf Hülsmann. - Wiesbaden : Englisch, 1991. - 64 p. : [59] colour ill. ; 28.5 cm.
Contents: p. 5.
Glossary: p. 63.
ISBN 3-8241-0437-7 (hardcover)
§ Title means: Etchings. Basic techniques and possibilities for designing
The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Brass / Copper / Steel / Steelfacing / Zinc
3 –
Chine Collé / Jigsaw Print / Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing
5 –
Art History / Conservation and Restoration
In: DNB-F; DBI-VK; DNB-L; Priv.Coll.

Huffel (Nicolaas Gerhardus van)
See: **Le Blon** (Jacque Christoph) [No. 180.4]
See: **Holleman** (Marius) [No. 148].

Hughes (Ann)
See: **D'Arcy Hughes** (Ann) & **Vernon-Morris** (Hebe) [No. 071].

Huygens 1 (Constantijn Sr.)　　　157

Etsgrondt / Constantijn Huygens. - [Den Haag?], [c. 1640?]. - [1] p. ; [c. 17 × 22 cm].
§ Title means: Etching ground
Manuscript.
Language: Dutch.
Gives ingredients for and how to prepare an etching ground.
See also: **Browne 2** (London 1669) [No. 049], the copy with Huygens' owner's inscription.
Title description after photocopy.
1 –
Line Etching
In: UBL-Dousa, Hugeniorum, Codex 48-I, fol. 14r.

Huygens 2 (Constantijn Sr.)　　　158

Musica, medica, physica, chijmica, odoriferea, perfumatoria, fusoria, coquinaria, philosophica, mathematica, artificialia / Constantijn Huygens. - [Den Haag?], [c. 1650?]
§ Title means: Musical, medical, physical, chemical, olfactory, perfume, liquid, culinary, philosophical, mathematical, artificial matters
Manuscript.
Language: Dutch.
MIP: fol. 230v–231r.
Gives instructions to make a plaster cast of an engraving.
See also: **Browne 2** (London 1669) [No. 049], the copy with Huygens' owner's inscription.

3 –
Casting / Ink / Printing in Black
In: KB, KA 47.

I

Imison (John)   159.1

The school of arts; or, an introduction to useful knowledge, being a compilation of real experiments and improvements, in several pleasing branches of science, on the following subjects, viz. mechanics, electricity, optics, construction of optical instruments, &c., grinding and polishing optic glasses, clock and watch-making and astronomy. The miscellaneous articles contain the most approved art of drawing, etching, engraving, crayon painting, gilding on glass, pots, &c., silvering looking glasses, &c., lackering, varnishing, soldering, casting in plaster &c., cements, glues, staining wood, and a composition for ornaments, &c. &c. &c. / by John Imison. - London : printed for the Author, and sold by J. Murray, [1785?]. - [4], iii, [5], 264, 124 p. : XIII, III pl. ; c. 18 cm.
Contents: p. [1] in the middle.
List of plates: p. [4] in the middle.
MIP: pt. 2, pp. 41–62.
§ BL: '"A treatise of the mechanical powers ... [etc.]" was reprinted, with additions, from the author's "School of Arts or an introductions to useful knowledge" in 1787 and 1794.'
The text on intaglio printmaking is almost literally taken from **Bowles** (London 1760) [No. 045] concerning subject and division. The recipes for red, white and black etching ground are derived from **Bate** (London 1634) [No. 024] or **Browne 2** (London 1665) [No. 049].
Apparently two parts in one binding.
P. 84 is numbered '74', p. 67 is numbered '6', p. 147 is numbered '174', p. 179 is numbered '176'.
Title description after microfilm.
1 –
Drypoint / Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Paper
4 –
Drawing / Painting
5 –
Aesthetics
In: BL (2×).

159.2

The school of arts; or, an introduction to useful knowledge, being a compilation of real experiments and improvements, in several pleasing branches of science ... [etc.] / John Imison. - The second ed., with very considerable additions. - London : printed for the Author, sold by J. Murray, [1787?]. - 2 vol. : pl. ; 20–21 cm.
§ OCLC: '1787'.
– Vol. 1: xv, [1], 319, [5] p. : […] pl.
– Vol. 2: [8], 176 p. : […] pl.
NOT SEEN
In: BL (2×); BNM; NUC–1956 (2×); OCLC.

159.3

The school of arts; or, an introduction to useful knowledge ... [etc.] / John Imison. - New ed. - London : W. Robins for the author, etc., 1787. - 2 vol. : folded front. & pl. ; 8º.
§ WLL: 'Leaf inserted inside front cover with repudiation of ed. published by Murray'.
– Vol. 1: […].
– Vol. 2: ... etching, engraving, mezzotinto scraping, aquatinta ... [etc.].
NOT SEEN
In: OCLC; WLL.

159.4

The school of arts; or, an introduction to useful knowledge , being a compilation of real experiments and improvements, in several pleasing branches of science ... [etc.] / John Imison. - The fourth ed., with very considerable additions. - London : printed for J. Murray and S. Highley, 1796. - 2 vol. : front., pl. ; 21–22.5 cm.
§ The text on intaglio printmaking is perhaps also used in Imison's 'Elements of science and art', with editions in 1803, 1808 and 1822.
– Vol. 1: 318, [1] p. : XX pl.
– Vol. 2: [8?], 176 p. : IV pl.
NOT SEEN
In: BL; ESTC: no. T127730; NUC–1956; OCLC.

J

Anweisung für Anfänger im Kupferstechen / hrsg. von J.F.A.C. - Altenburg : K.H. Richter, 1797. - 39 p. ; 8º.
NOT SEEN
In: LC; *Singer & Strang 1897*: no. 77.

Techniek van de grafische kunst / door H[arry] van Kruiningen ; voorwoord van [Willem] Jos[iah] de Gruyter ; [photogr. Ulkoja, Amsterdam]. - [1st ed.]. - Rotterdam : Lemniscaat, 1966. - 80 p. : [44] ill. ; 21 cm.
Contents: p. 8.
MIP: pp. 19–55, 76–80 : [28], [6] ill.
§ Title means: Technique of the graphic art
Harry van Kruiningen is pseudonym of Henri Adelbert Janssen.
The year of copyright is given as the year of publication here.
The illustrations are photographs and reproductions
Most of the photographs showing the various printmaking techniques were used a year before in: Van prenten en platen : de grafische technieken in voorbeelden, afbeeldingen en beschrijving / Jan Poortenaar. - 6th ed. / ed. by Henk Hester. - Deventer : Kluwer, 1965.
Softcover, printed in b/w.
1 –
Aquatint / Collagraphy / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Zinc
3 –
Paper / Press / Printing in Black / Steelfacing
4 –
Linocut / Lithography / Screen Printing / Wood Engraving / Woodcut
5 –
Art History
In: CCB; GBR; KABK; KB (2×); KUB; MBvB; MvC; NBLC; NCC; Priv.Coll.; RAA; RCE; RMA; TUD; TUE; TUT; UBA (2×); UBG; UBL-KHI; UBU.

Techniek van de grafische kunst / door H[arry] van Kruiningen ; voorwoord van [Willem] Jos[iah] de Gruyter ; [photogr. Ulkoja, Amsterdam]. - Tweede druk. - Rotterdam : Lemniscaat, 1968. - 80 p. : [44] ill. ; 20 cm.
Contents: p. 8.
MIP: pp. 19–55, 76–80 : [28], [6] ill.
§ Title means: Technique of the graphic art
With some corrections in the text.
Softcover, printed in b/w.
In: CCB; KABK; KBR; Priv.Coll.

Techniek van de grafische kunst / door H[arry] van Kruiningen ; voorwoord van [Willem] Jos[iah] de Gruyter ; [photogr. Ulkoja, Amsterdam]. - Derde druk. - Rotterdam : Lemniscaat, 1970. - 80 p. : [44] ill. ; 20 cm.
Contents: p. 8.
MIP: pp. 19–55, 76–80 : [28], [6] ill.
ISBN 90-6069-029-X (softcover)
§ Softcover, printed in b/w.
In: KABK; Priv.Coll.; UBU.

Techniek van de grafische kunst / door H[arry] van Kruiningen ; voorwoord van [Willem] Jos[iah] de Gruyter ; [photogr. Ulkoja, Amsterdam]. - [Foto's: Ulkoja, Amsterdam en Akademie van Beeldende Kunst, Arnhem]. - Vierde druk. - Rotterdam : Lemniscaat, 1972. - 87 p. : [45] ill. ; 21 cm.
Contents: p. 8.
MIP: pp. 19–55, 81–87 : [28], [4] ill.
Stocklist: backside cover.
ISBN 90-9069-029-X (hardcover)
§ Title on cover: Techniek van de grafische kunst : gravure, ets, litho, zeefdruk, experimenten
The chapter on screen printing and the last chapter on experiments are extended. Added are three photographs concerning screen printing and one photo on intaglio printmaking has been removed.
Hardcover, printed in black on yellow.
In: CCB; KABK; MMW; NCC; OBA; Priv.Coll.; RAA; TUD; UBL; UBN.

Techniek van de grafische kunst / door H[arry] van Kruiningen ; voorwoord van [Willem] Jos[iah] de Gruyter ; [photogr. Ulkoja, Amsterdam]. - Vijfde druk. - Rotterdam : Lemniscaat, 1974. - 87 p. : [45] ill. ; 21 cm.
Contents: p. 8.
MIP: pp. 19–55, 81–87 : [28], [4] ill.
Stocklist: backside cover.
ISBN 90-9069-029-X (hardcover)
§ Hardcover, printed in black on yellow.
In: NCC; Priv.Coll.; RAA; RHM TUD;

Techniek van de grafische kunst / door H[arry] van Kruiningen ; voorwoord van [Willem] Jos[iah] de Gruyter ; [photogr. Ulkoja, Amsterdam]. - Zesde druk. - Rotterdam : Lemniscaat, 1978. - 87 p. : [45] ill. ; 21 cm.
Contents: p. 8.

MIP: pp. 19–55, 81–87 : [28], [4] ill.
Stocklist: backside cover.
ISBN 90-9069-029-X (hardcover)]
§ The edition number 'Vijfde druk 1974' in the colophon (p. 4) is struck through and 'Zesde druk 1978' is printed above it.
Hardcover, printed in black on yellow.
In: KB; NBLC; NCC; Priv.Coll. (2×); RCE; TUD; UBA.

161.7

The techniques of graphic art / by H[arry] vn Kruiningen ; foreword by [William] Jos[iah] de Gruyter ; transl. [from the Netherlands] by B.K. Bowes ; photos Ulkoja. - London [etc.] : Angus and Robertson, cop. 1969. - 80 p. : [44] ill. ; 21.5 cm.
Contents: p. 8.
MIP: pp. 19–56, 77–80 : [28], [6] ill.
SBN 207-95128-4
§ Translation of the edition: Rotterdam 1966.
In: BL; BLBS; NCC; OCLC; UBG; ULC.

161.8

The techniques of graphic art / by H[arry] van Kruiningen ; foreword by [Willem] Jos[iah] de Gruyter ; transl. [from the Netherlands] by B.K. Bowes. - New York ; Washington : Praeger, 1969. - 84 p. : ill. ; 22 cm. - (Books that matter).
Contents: p. 8.
MIP: pp. 19–56, 77–80 : [28], [6] ill.
§ Translation of the edition: Rotterdam 1966.
In: CCB; KB; OCLC.

Jansz. (Claes)
Visscher (Claes Jansz.)
See: **Brugghen** (Gerard ter) [No. 050].

Jorge (Alice) & **Gabriel** (Maria)   162.1

Técnicas da gravura artística : xilogravura, linóleo, calcografia, litografia / Alice Jorge, Maria Gabriel. - [1st ed.]. - Lisboa : Livros Horizonte, cop. 1986. - 159 p. : [220] ill. ; 24 cm. - (Colecção Estudos de Arte ; 8).
List of titles in the series: p. 4.
List of reproductions: p. 6.
Contents: p. 7.
Glossary: p. 12.
MIP: pp. 42–107 : [91] ill.
§ Title means: Techniques of artistic engraving: woodcut, linocut, intaglio printmaking, lithography
The preface is dated, p. 9: 'Septembro de 1984'.
The illustrations are diagrams, photographs and reproductions. Some illustrations are numbered.
1 –
Aquatint / Crayon Engraving / Drypoint / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Copper / Steelfacing / Zinc
3 –
Multiple-plate Printing / Ink / Paper / Press / Printing in Black / Printing Polychrome / Viscosity Colour Printing
4 –
Linocut / Lithography / Woodcut
5 –
Art History
In: Priv.Coll.

162.2

Técnicas da gravura artística : xilogravura, linóleo, calcografia, litografia / Alice Jorge, Maria Gabriel. - 2a. edição. - Lisboa : Livros Horizonte, 2000. - 189 p. : [220] ill. ; 24 cm.
List of titles in the series: p. 4.
Contents: p. 5.
List of reproductions: p. 8.
MIP: pp. 45–124 : [91] ill.
Glossary: p. 189.
§ The text has been reset but is almost identical to the text in the first edition. Some illustrations have been replaced.
In: Priv.Coll.

Juna (Zdeněk)   163

Lept a příbuzné techniky / Zdeněk Juna. - Praha : St. Nakl. Kránélit[…], 1954. - 15, 63 p. ; 8º. - (Technika a(r)emeslo ; 6).
§ Title means: Etching and its allied techniques
Perhaps descriptive.
NOT SEEN
In: SBB.

Jurkiewicz (Andrzej)   164.1

Podręcznik metod grafiki artystycznej / Andrzej Jurkiewicz. - [1st, deluxe ed.]. - Kraków : nakładem własnym autora [= published on account of the author], 1938–1939. - 2 vol. : ill. ; 31.5–32.5 cm.
§ Title means: Manual of methods for artistic printing

The first volume is about intaglio printmaking and the second volume concerns lithography. A third volume on relief printing was planned, but never appeared probably due to the start of the Second World War.
Limited edition.
The *tablic* are etchings and lithographs, specimens of the techniques instructed.
– Vol. 1: Część pierwsza. Druk wgłębny. - 1938. - 64, [1] p. : [18] diagrams, [1], 10 tab.
Polyglot: p. 63.
Contents: p. [1].
§ Volume title means: Volume one. Intaglio printing
Extra etching mounted on the title page.
The polyglot is a Polish–French–German glossary.
This volume is about intaglio printmaking only.
– Vol. 2: Część druga. Druk płaski (litografie). - 1939. - 150, [1] p. : [32] diagrams, [1], 15 tab., of which [4] in colour.
Contents: p. [1].
§ Volume title means: Volume two. Lithography (lithography)
The *tablic* are lithographs; an extra lithograph is mounted on the title page.
This volume is about lithography only.
1 –
Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Plastic / Copper / Steelfacing / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Lithography
5 –
Art History
In: BNW; MNW; UJK.

164.2

Podręcznik metod grafiki artystycznej / Andrzej Jurkiewicz ; [tab. by Andrzej Jurkiewicz]. - [1st ed.]. - Kraków : nakładem własnym autora [= published on account of the author], 1938–1939. - 2 vol. : diagrams, tab. ; 31 cm.
§ The *tablic* are etchings and lithographs.
– Vol. 1: Część pierwsza. Druk wgłębny. - 1938. - 64, [1] p. : [18] diagrams, 10 tab.
Polyglot: p. 63.
Contents: p. [1].
§ Volume title means: Volume one. Intaglio printing
The polyglot is a Polish–French–German glossary.
This volume is about intaglio printmaking only.
– Vol. 2: Część druga. Druk płaski (litografie). - 1939. - 150, [1] p. : [32] diagrams, 15 tab.
Contents: p. [1].
§ Volume title means: Volume two. Lithography (lithography)
This volume is about lithography only.
NOT SEEN
In: MNW; OCLC.

164.3

Podręcznik metod grafiki artystycznej / Andrzej Jurkiewicz. - [2nd ed.] / opracował i rozszerzył [= rev. and enl.] [by] Roman Artymowski. - Warszawa : Arkady, 1975. - 293, [2] p. : 36 pl. ; 24–25 cm.
Contents: p. 5.
MIP: pp. 14–42, 206–208, 224–226.
Polyglot: p. 231.
Literature: p. 285.
List of artists: p. 287.
Index: p. 290.
§ P. 4: the text was compiled in 1973 and the printing started in 1974.
P. 5: The parts in the contents beginning with 'R.A.' are written by Roman Artymowski.
Title description after notes and some photocopies.
1 –
Aquatint / Crayon Engraving / Drypoint / Electrolytic Etching / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Aluminium / Glass / Copper / Plastic / Zinc
3 –
Casting / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Gypsum Cut / Line Block / Linocut / Monotype / Wood Engraving / Woodcut / Lithography / Screen Printing
5 –
Original and Reproduction
NOT SEEN
In: MNW; UJK.

K

Kätelhön (Henner)   165.1

Die Radierung : Erfahrungen einer Kupferdruckerei / Text von Siegfried Fuchs; Herausgeber Druckgraphik Henner Kätelhön ; Abbildungen von Siegfried Fuchs. - [1st ed.]. - Möhnesee-Wamel : Kätelhön, 1972. - 39 p. : ill. ; 30 cm.
§ Title means: Etching: experiences of a plate printing studio
The firm of Druckgraphik Kätelhöhn KG is a professional plate printing studio.
NOT SEEN
In: DBI-VK.

165.2

Die Radierung : Erfahrungen einer Kupferdruckerei / Henner Kätelhön ; [coop. of] Hans Wille ; Fotos Jürgen Gölzenleuchter. - 2. Aufl., in einer völlig neuen Fassung. - Möhnesee-Wamel : Kätelhön, 1978. - 80 p. : [3], 11, [74] b/w Abb., [10] colour Abb. ; 30.5 cm.
Contents: p. 2.
Index: p. 77.
Suppliers: p. 78.
§ Colophon, p. 80: 'Ausgabe März 1978'.
The *Abbildungen* are diagrams, photographs and reproductions.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Brass / Steelfacing / Zinc
3 –
Counterproof / Multiple-plate Printing / Printing in Black / Printing à la Poupée / Printing Polychrome
5 –
Art History / Health and Safety
In: DNB-F; DBI-VK; DNB-L; UBAB.

165.3

Die Radierung. Erfahrungen einer Kupferdruckerei / Henner Kätelhön ; [coop. of Hans Wille] ; [preface and epilogue Klaus Jüdes]. - 3. veränderte Aufl. - Möhnesee : Steintor, 1998. - 80 p. : [3], 11, [74] b/w Abb., [10] colour Abb. ; 31.5 cm.
Contents: p. 2.
Index: p. 77.
Suppliers: p. 79.
ISBN 3-00-003982-1 (hardcover)
§ The text has been reset but is largely the same as the second edition. With a new preface and new postscript. Some diagrams and photographs, and most of the reproductions have been replaced. New are the Carborundum Print and Collagraph techniques. The list of suppliers has been revised.
Colophon, p. 80: 'Ausgabe Oktober 1998'.
1 –
Aquatint / Carborundum Print / Collagraph / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Brass / Steelfacing / Zinc
3 –
Counterproof / Multiple-plate Printing / Printing in Black / Printing à la Poupée / Printing Polychrome
5 –
Art History / Health and Safety
In: DNB-F; DNB-L; Priv.Coll.

165.4

Die Radierung : Erfahrungen einer Kupferdruckerei / Henner Kätelhön ; Hrsg. Klaus Jüdes. - 4. Aufl. - Möhnesee : Steintor Verl., 2007. - 80 p. : ill. ; [31?] cm.
NOT SEEN
In: KVK.

Keller (Karl Urban)   166

Neue bisher noch unbekannte Art, den Tusch in Kupfer nachzuahmen, ohne irgend ein Aezmittel / von K[arl] U[rban] Keller ; [pl. by Karl Urban Keller]. - Stuttgart : in Commission bei Löflund, 1815. - 32 p. : [3] pl. ; 17.5 cm.
§ Title means: A new and until now unknown manner to reproduce washed tones in copper without using any mordant
The prints are specimens of the mezzotint-like process described.
Title description after photocopy of the text and photographs of the prints.
1 –
Aquatint / Line Etching / Mezzotint
2 –
Copper
5 –
Health and Safety
In: DBI-VK; NUC–1956; *Singer & Strang 1897*: no. 95; WLS.

Manuel de la gravure originale. Les procédés de la taille-douce, du bois, de la lithographie, du monotype, etc. Comment reconnaître les divers procédés / par Henri Kerels. - Bruxelles ; Bieleveld, [1949]. - 113, [34] p. : 32 pl. ; 24.5–25 cm.
List of other works by Kerels: p. 6.
MIP: pp. 11–76 : pl. 1–3, 5–16, 23–32.
Illustrations: p. [3].
Subject index: p. [29].
Artist index: p. [31].
List of illustrations: p. [32].
Contents: p. [33].
With addenda & corrigenda.
§ Title means: Manual for original printmaking. The processes of etching and engraving, woodcutting, lithography, monotype, etc.
NUC–1956: '[1950]'.
The *planches* are diagrams and reproductions.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Copper / Steel / Zinc
3 –
Printing in Black
4 –
Linocut / Lithography / Monotype / Screen Printing / Woodcut / Wood Engraving
In: KBR; Priv.Coll. (2×).

Etching ; an outline of its technical processes & its history : with remarks on collections and collecting / by S[ylvester] R[osa] Koehler. - New York ; London ; Paris ; Melbourne : Cassel, cop. 1885. - XIV, [2], 238 p. : 30 pl., 95 ill. ; 40 cm.
Contents: p. VII.
List of illustrations: p. IX.
MIP: pp. 195–227 : pl. 29–30b, ill. 86–94.
Supplier of copper plates: p. 196.
Suppliers of presses: p. 217.
Specimens: pl. 29 between pp. 212 and 213.
Name index: p. 229.
With literature.
§ Koehler refers to **Lalanne** (Paris 1866) [No. 178] for intaglio printmaking which he himself translated; see **Lalanne** (London 1880) [No. 178.12]. He also reproduces some of Lalanne's plates.
Plate printer, p. II: 'Etchings printed by Messrs. Kimmel & Voigt, New York.'
All plates are photogravures ('heliotypes'). The plates are numbered '1'–'29', '30a' and '30b'. The latter two are printed from the same plate, the first with and the second without *retroussage*. Plate 29 has specimens of the etching techniques discussed.
1 –
Aquatint / Crayon Engraving / Drypoint / Line Etching / Soft-ground
2 –
Copper / Steelfacing
3 –
Ink / Paper / Press / Printing in Black / Rubbing
5 –
Art History
In: *Blas Benito 1994*: 69; *Bridson & Wakeman 1984*: no. B33; *Hind 1963-1*: 400; *Levis 1910*: 54; *Levis 1912*: 107; NUC–1956; OCLC; RMA; *Singer & Strang 1897*: no. 320.

Eigentijds etsen. Etsen met moderne materialen en technieken / Karel Kok ; tekst met medewerking van Leo Musch ; fotografie en tekeningen Karel Kok, Hans van Ommeren. - De Bilt : Cantecleer, 1982. - 79 p. : 47 afb. ; 21 cm. - (Werken en Spelen).
Stocklist: p. 78.
ISBN 90-213-1384-7 (softcover)
§ Title means: Contemporary etching. Etching with modern materials and techniques.
The *afbeeldingen* are diagrams, photographs and reproductions
See the complementary publication: **Kok 2** (De Bilt 1983) [No. 170].
1 –
Aquatint / Collagraph / Line Etching
2 –
Aluminium / Copper / Iron / Plastic / Brass / Zinc
3 –
Blind Embossment / Hand-colouring / Ink / Monotype / Multiple-plate Printing / Nature Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing
5 –
Art History / Conservation and Restoration
In: GBR; GLA; KB; NBLC; NCC; OBA; Priv.Coll.; RAA.

Fotografisch etsen / Karel Kok. - De Bilt : Cantecleer, 1983. - 64 p. : 30c ill. ; 21 cm. - (Werken en Spelen).
ISBN 90-213-1393-6 (softcover)
§ Title means: Photographic etching
This publication is complementary to: **Kok 1** (De Bilt 1982) [No. 169].
1 –
Photomechanical Etching
2 –
Copper / Zinc
In: KB; NCC; OBA; Priv.Coll.

Die Praxis des modernen Kupferstiches (Grabsticheltechniek) / von Alois Kosch-Görlitz ; [preface by Biehl] ; [ill. by Alois Kosch-Görlitz]. - Wien ; Leipzig : Hartleben, 1932. - VIII, 75, [5] p. : 24 Abb. ; [18–19?] cm. - (A. Hartleben's chemisch-technische Bibliothek ; 393).
Index: p. 73.
Advertisement: p. [4].
With literature.
§ Title means: The practice of modern engraving (burin technique)
The author's name is Alois Kosch and he comes from Görlitz.
The *Abbildungen* are diagrams and reproductions.
1 –
Line Engraving
2 –
Copper / Iron / Steel / Zinc
3 –
Ink / Paper / Printing in Black
5 –
Art History
In: ABK; DNB-L; GLA; NUC–1956; SBB.

Celluloid etching / by Albert Kosloff ; illustrations and celluloid drypoints by the author. - Chicago, Ill. : Kosloff, 1940. - 31 fol. : [6] reprod., V pl. ; 20.5 cm.
Contents: fol. 4r.
NOT SEEN
In: NUC–1956; OCLC (48×).

Celluloid etching / by Albert Kosloff ; illustrations and celluloid drypoints by the author. - Second printing. - Chicago, Ill. : Kosloff, 1940. - 31 fol. : [6] reprod., V pl. ; 20.5 cm.
Contents: fol. 4r.
§ The plates are diagrams.
1 –
Aquatint / Drypoint
2 –
Plastic
3 –
Ink / Paper / Printing in Black
In: NUC–1956; OCLC.

Die Kunst der Radierung : Werkzeuge, Techniken, Arbeitsprozesse / Maureen Krick. - Wiesbaden ; Berlin : Bauverlag, cop. 1985. - 153, [2] p. : ill. ; 30 cm.
Contents: p. 6.
Glossary: p. 11.
Literature: p. 148.
Index: p. 149.
Stocklist: p. [1].
ISBN 3-7625-2244-8 (softcover)
§ Title means: The art of etching: tools, techniques, working manners
The illustrations are diagrams and reproductions.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Échoppe / Line Engraving / Line Etching / Mezzotint / Relief Etching / Soft-ground
2 –
Copper / Iron / Steel / Zinc
3 –
Multiple-plate Printing / Paper / Press / Printing in Black / Printing Monochrome / Printing Polychrome
5 –
Aesthetics
In: DNB-F; DBI-VK; DNB-L; NCC; OBA; OCLC (2×); Priv.Coll.; SBB; UBH.

Krünitz (Johann Georg)
See: **Tischbein** Jr. (Johann Heinrich) [No. 337.2].

Kruiningen (Harry van)
See: **Janssen** (Henri Adelbert) [No. 161].

<div align="right">

Kubas (Jozef) 174
</div>

Techniky umeleckey grafiky / Jozef Kubas ; [preface by Vincent Hložník]. - [Bratislava] : Slovenské Vydavateľstvo Krásnej Literatúry, 1959. - 221 p. : 61 obr., XIII tab. ; 21 cm.
MIP: pp. 101–158 : front., ill. 33–49, tab. I–XIII.
With literature.
§ Title means: Artistic graphic techniques
The preface by the author is dated, p. 8: 'Bratislava, máj 1957'.
The *obrazy* are diagrams, the *tabu'ky* are reproductions of textures of various etching techniques.
Title description after photocopy.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground / Stipple Engraving
2 –
Copper / Zinc
3 –
Multiple-plate Printing / Printing in Black / Printing Polychrome
4 –
Lithography / Troubleshooting / Woodcut / Wood Engraving
5 –
Art History
In: *Blas Benito 1994*: 82; UKB.

Künstler
See: **Liebhaber 2** [No. 187].

L

<div align="right">

Lady 175
</div>

The hand-book of useful and ornamental amusements and accomplishments, including artificial flower making, engraving, etching, painting in all its styles, modelling, carving in wood, ivory, and shell, also fancy work of every description / by a Lady. - London : Smith, Elder, 1845. - xx, 316, 24 p. : [15] ill., VI pl. ; 18 cm.
Contents: p. ix.
List of plates: p. xix.
MIP: pp. 61–63, 68–72 : [2] ill.
Stocklist: p. 1, at the back.
§ Title description after microfilm.
The illustrations are wood engravings printed within the text, the plates are etchings (?) bound after the text.
1 –
Line Engraving / Line Etching
2 –
Copper
3 –
Print behind Glass
4 –
Lithography / Wood Engraving
5 –
Art History
In: BCIN; BL; LC; ULC.

<div align="right">

Laer (Willem van) 176.1
</div>

Weg-wyzer voor aankoomende goud en zilversmeeden. Verhandelende veele weetenschappen, die konsten raakende, zeer nut voor alle jonge goud en zilver-smeeden / te zaamen gestelt door Willem van Laer. - [1st ed.]. - t'Amsterdam : voor den Auteur, te bevraagen [te bekoomen] by Jan Stand, Knegt van 't Goud en Zilver-Smeeden Gilt, 1721 ; Amsterdam : by Fred[e]rik Helm [printer], 1721. - [8], 212, [4] p. : 6 ill. ; 8º.
§ Title means: Guide for novice gold- and silversmiths. Discussing many sciences touching the arts, very useful for all young gold- and silversmiths
The text is probably the same in all editions.
Preface dated, p. [8]: 'Amsterdam den 1. April, 1721'.
Page 212 is numbered '112'.
Intended audience, title page: 'jonge goud en zilver-smeeden'.
NOT SEEN
In: PBM; RKD; UBA; UBN.

Weg-wyzer voor aankomende goud en zilversmeden. Verhandelende veele wetenschappen, die konsten raakende, zeer nut voor alle jonge goud en zilversmeden / te zaamen gestelt door Willem van Laer. - Tweeden druck. - Amsterdam : ten kosten van den auteur ; Mechelen : J.F. Vander Elst, [1722?]. - [8], 212, [4] p. : 6 engr. ; 16.5 cm.
MIP: pp. 210–211.
Index: p. [1] at the back.
§ According to the *impressum*, the book was printed at the expenses of the author, so probably Van Laer, who died in 1722, was still alive then and the edition would have been printed shortly before his death.
1 –
Line Engraving
2 –
Silver
3 –
Rubbing
4 –
Goldsmithing
In: NUC; UBL-KHI.

Weg-wyzer voor aankomende goud en zilver-smeden. Verhandelende vele wetenschappen, die konsten rakende, zeer nut voor alle jonge goud en zilver-smeeden / te zamen gestelt door Willem van Laar. - [3rd ed.]. - Middelburg : Willem de Klerk [printer], 1730. - [8?], 212 [?], [4?] p. : [6?] ill. ; 8º.
NOT SEEN
In: Priv.Coll.

Weg-wyzer voor aankoomende goud en zilversmeeden ... [etc.] / Willem van Laer. - [4th ed.]. - Amsterdam : Voor de Weduwe Jan Stant, 1768. - [8], 212, [4] p. : 6 ill.
MIP: pp. 210–211.
Index: p. [1] at the back.
§ Preface dated, p. [8]: 'Amsterdam den 1. April, 1721'.
Photomechanical reprint: Lochem 1967 [No. 176.5].
In: NGZK (inc.); RKD; RMA; UBA.

Weg-wyzer voor aankomende goud en zilversmeden / door Willem van Laer. - Fotomechanische herdruk / opnieuw uitgegeven en van een inleiding voorzien door B. Dubbe. - Lochem : De Tijdstroom, 1967. - XXXII, [8], 212, [4] p. : 6 ill. ; 17 cm.
Glossary: p. XIV.
Literature: p. XXX.
MIP: pp. 210–211.
Index: p. [1] at the back.
§ Preface dated, p. VIII: 'Deventer, 31 december 1966'.
The preface contains information on the various editions, a glossary and a biography of Willem van Laer.
Photomechanical reprint of: Amsterdam 1768 [No. 176.4].
In: ASD; KB; NBLC; NGZK; OBA; Priv.Coll.; RCE; UBA; UBG; UBR; UBT.

Het groot schilderboek / door Gerard de Lairesse ; [eulogies by F(rançois?) Halma ... et al.] ; [inv. Gerard de Lairesse] ; [del. J(an Cornelisz) Hoogsaat ... et al.] ; [sculp. (Abraham de) Blois ... et al.]. - [1st ed.]. - Amsterdam : by de Erfgenaamen van Willem de Coup, 1707. - 2 vol. : ill. ; 22 cm.
§ Title means: The big book on painting
The texts of the eighteenth-century Dutch editions are nearly identical, just reset. Differences are found in the dedications and eulogies. The translations are according to the Dutch text.
The author mainly discusses theoretical and aesthetical issues, with practical remarks in between.
Copies of the *Groot schilderboek* were available in Japan in the eighteenth century. Some parts of the text were translated (manuscript) and plates were copied, such as where Lairesse speaks about perspective, but probably not the parts on printmaking.
– Vol. 1: Eerste deel. - [18], 434, [36] p. : front., portrait, [51] ill.
Contents: p. [1] at the back.
§ The frontispiece is dated: ''t Amsterdam, by Willem de Coup, en Petrus Schenk. 1707'.
Portrait in mezzotint of De Lairesse opp. fol. **3r.
– Vol. 2: Twede deel. - 400, [30] p. : 15 ill.
MIP: pp. 369–400 : [3] ill.
Contents: p. [1].
1 –
Line Engraving / Line Etching / Mezzotint
2 –
Copper
4 –
Drawing / Painting
5 –
Aesthetics / Art History
In: CCB; HAB; NCC; PBM; RMA; UBA; UBL-KHI; UBT; UBM; VU.

Groot schilderboek, waar in de schilderkonst in al haar deelen grondig werd onderweezen, ook door redeneeringen en printverbeeldingen

verklaard; met voorbeelden uyt de beste konst-stukken der oude en nieuwe puyk-schilderen, bevestigd: en derzelver wel- en misstand aangeweezen / door Gerard de Lairesse ; [inv. Gerard de Lairesse] ; [fec. M. Pool ... et al.] ; [del. J(an Cornelisz) Hoogsaat ... et al.] ; [sculp. (Abraham de) Blois ... et al.]. - Amsterdam : by Hendrick Desbordes, 1712. - 2 vol. : ill. ; 21.5 cm.
– Vol. 1: [16], 434, [36] p. : front., 51 ill.
– Vol. 2: 400, [30] p. : 15 ill.
MIP: pp. 369–400 : [3] ill.
Contents: p. [1]
In: AHM (vol. 1); CCB; NCC; NSUG; UBA (2×).

177.3

Groot schilderboek, waar in de schilderkonst in al haar deelen grondig werd onderweezen, ook door redeneeringen en printverbeeldingen verklaard; met voorbeelden uyt de beste konst-stukken der oude en nieuwe puyk-schilderen, bevestigd: en derzelver wel- en misstand aangeweezen / door Gerard de Lairesse ; [inv. Gerard de Lairesse] ; [fec. M. Pool ... et al.] ; [del. J(an Cornelisz) Hoogsaat ... et al.] ; [sculp. (Abraham de) Blois ... et al.]. - Amsterdam : by David Mortier, 1714. - 2 vol. : ill. ; 21.5 cm.
– Vol. 1: [14], 434, [36] p. : front., 51 ill.
– Vol. 2: 400, [30] p. : 15 ill.
MIP: pp. 369–400 : [3] ill.
Contents: p. [1]
In: CCB; UBA; UBG; UBU.

177.4

Groot schilderboek, waar in de schilderkonst in al haar deelen grondig werd onderweezen, ook door redeneeringen en printverbeeldingen verklaard; met voorbeelden uyt de beste konst-stukken der oude en nieuwe puyk-schilderen, bevestigd: en derzelver wel- en misstand aangeweezen / door Gerard de Lairesse ; [fec. M. Pool ... et al.] ; [del. J(an Cornelisz) Hoogsaat ... et al.] ; [sculp. Blois ... et al.]. - Amsterdam : by Hendrik Blank, 1716. - 2 vol. : ill. ; 20.5 cm.
– Vol. 1: [4], 434, [36] p. : front., 51 ill.
– Vol. 2: 400, [30] p. : 15 ill.
MIP: pp. 369–400 : [3] ill.
Contents: p. [1]
In: CCB; RMA; UBA.

177.5

Groot schilderboek, waar in de schilderkonst in al haar deelen grondig werd onderweezen, ook door redeneeringen en prentverbeeldingen verklaard; met voorbeelden uit de beste konststukken der oude en nieuwe puikschilderen / bevestigd: en derzelver wel- en misstand aangeweezen door Gerard de Lairesse ; [dedicatory poems by Janus Brouckhusius … et al. ; [inv. Gerard de Lairesse] ; [fec. Gilliam van der Gouwen ... et al.] ; [del. J(an Cornelisz) Hoogsaat ... et al.] ; [sculp. Abraham de Blois ... et al.]. - Tweden druk, vermeerdert met des schyvers levensbeschryving [by Arnold Houbraken]. - Haarlem : by Johannes Marshoorn, 1740. - 2 vol. : ill. ; 26 cm.
Opdracht, p. [4]: 'In Haarlem, den Nov: 1740'.
§ Photomechanical reprint: Doornspijk 1966 [No. 177.15].
– Vol. 1: [60], 434, [33] p. : front., [51] ill.
Contents: p. [1] at the back.
– Vol. 2: 400, [28] p. : [15] ill.
MIP: pp. 371–400 : [3] ill.
Contents: p. [1].
In: AHM; CCB; KB; KSM; RMA (2×); UBA; UBH; TUD; TUE; VU.

177.6

Groot schilderboek, of grondig, volledig en beredeneerd onderwijs in de schilderkunst; met voorbeelden uit de kunst-stukken van vroegere en latere meesters / door Gerard de Lairesse ; [inv. Gerard de Lairesse] ; [fec. Gilliam van der Gouwen ... et al.] ; [del. J(an Cornelisz) Hoogsaat ... et al.] ; [sculp. Abraham de Blois ... et al.]. - Amsterdam : P. van Rossen, 1836. - Derde en verbeterde druk. - 4 vol. : pl. ; 22.5 & 24.5 cm.
MIP: vol. 2, binding 2, pp. 238–259.
§ Two volumes of text in three bindings, the plates are in a separate folder.
– Vol. 1, 1st binding: Eerste deel […]. - […] p. ; 22.5 cm.
– Vol. 2, 2nd binding: Tweeden deels, eerste stuck. - […] p. ; 22.5 cm.
– Vol. 3, 3rd binding: Tweeden deels, tweede stuck. - VIII, 259 p. ; 22.5 cm.
– Vol. 4: Platen tot de Lairesse, Groot schilderboek. - [2], XLIV pl. ; 24.5 × 19 cm.
§ This folder contains the etched frontispiece, the etched author's portrait and 44 etchings numbered I–XLIV. These are slightly worn restrikes of the original plates printed on nineteenth-century paper, watermark: Dutch Lion, JKool & Comp. The illustrations originally carried the page numbers they referred to, but these have been scraped off and replaced by serial numbers. The plate with the title and the author's portrait are not numbered.
In: CCB; RMA (inc.); UBA (inc.); UBG.

177.7

Dess Herrn Gerhard de Lairesse, welt-belobten Kunst-Mahlers, großes Mahler-Buch. Worinnen die Mahler-Kunst in allen ihren Theilen gründlich gelehret, durch Beweißthümmer und Kupfferstiche erkläret, auch mit Exempeln aus den besten Kunst-Stücken der brühmtesten alten und neuen Mahler bestätigt, anbey derselben Wohl- und Übelstand angewiesen wird / aus dem Holländischen in das Hoch-Teutsche übersetzt [von Samuel Theodor Gerike]; [M(ichael) Rößler scu.]. - Nürnberg : Im Verlag Johann Christoph Weigel, Künst-Händlers, seel. Wittib ; gedruckt bey Lorenz Bieling, 1728–1730. - 4 vol. : ill. ; 21–23 cm.
§ The illustrations are copied after the originals.
– Vol. 1: Erster Theil. - 1728. - [8], 181, [1] p. : [15] ill.
Addenda & corrigenda: p. [1] at the back.
– Vol. 2: Ersten Theils I Continuation. - 1728. - 80 p. : [8] ill.
Addenda & corrigenda: p. 80.
– Vol. 3: Ersten Theils II Continuation. - 1729. - 199, [37] p. : [20] ill.
Contents: vol. 1–3: p. [1].

Addenda et corrigenda: p. [37].
– Vol. 4: Zweyter Theyl. - 1730. - [8], 427, [34] p. : [15] ill.
Contents: p. [1] at the back.
MIP: pp. 394–427 : [3] ill.
Addenda & corrigenda: p. [34].
In: CCB; HAB; KSM; KVK; NSUG; RMA; UBAB; UBH (inc.).

Großes Maler-Buch worinnen die Mahlerey nach allen ihren Theilen gründlich gelehret, durch vernünftige Raisonnements über Gemählde erklärt, und aus den besten Kunststücken der alten und neuen berühmtesten Mahler in Kupferstichen deutlich dargestellt wird / von Gerhard de Lairesse. - Neue mit der Urschrift verglichene Ausg. - Nürnberg : bey Chr[istoph] Weigel und Adam Gottl. Schneider, 1784. - 3 vol. : ill. ; 21 cm.
With literature.
– Vol. 1: Erster Band, erstes und zweytes Buch. - [6], 180 p. : front., 14 engr.
– Vol. 2: Zweyter Band, drittes, viertes, fünftes und sechstes Buch. - [6] p., p. 3–82, p. 3–199, [37] p. : front., 36 engr.
Index to pts. 1–6: p. [1] at the back.
– Vol. 3: Dritter Band, siebendes bis zwölftes Buch. - [6], 427, [34] p. ; front., 15 engr.
MIP: pp. 394–427 ; engr. 13–15.
Index to pts. 7–12: p. [1] at the back.
Addenda & corrigenda: p. [34] at the back.
In: KVK; UBH.

Großes Maler-Buch worinnen die Mahlerey nach allen ihren Theilen gründlich gelehret, durch vernünftige Urtheile über Gemählde erklärt, und aus den besten Kunststücken der alten und neuen berühmtesten Mahler in Kupferstichen deutlich dargestellt wird / von Gerhard de Lairesse. - Neue mit der Urschrift verglichene Ausg. - Nürnberg : in A.G. Schneider und Weigels Buchhandlung, 1818–1819. - 3 vol. ; 4º
NOT SEEN
In: KVK.

The art of painting : in all its branches, methodically demonstrated by discourses and plates, and exemplified by remarks on the paintings of the best masters : and their perfections and oversights laid open / by Gerard de Lairesse ; transl. by John Frederick Fritsch ; engr. by J[ohn] Carwitham. - London : printed for the author and sold by J. Brotherton [et al.], 1738. - [2], iv, [10], 654, [2] p. : front., LXXI pl. ; 23 cm.
Directions to the bookbinder, addenda & corrigenda: last fol.
NOT SEEN
In: BL; ESTC: no. T142680; KVK.

The art of painting, in all its branches, methodically demonstrated by discourses and plates, and exemplified by remarks on the paintings of the best masters : and their perfections and oversights laid open / by Gerard de Lairesse ; transl. by John Frederick Fritsch. - London : printed for S. Vandenbergh [et al.], 1778. - [20], 504 p. : front., 71 pl. ; 24 cm.
NOT SEEN
In: BL; KVK; ULC.

A treatise on the art of painting, in all its branches : accompanied by seventy engraved plates, and exemplified by remarks on the paintings of the best masters / by Gerard de Lairesse. - Rev., cor., and accompanied with an essay, by W[illiam] M[arshall] Craig. - London : E. Orme, 1817. - 2 vol. : 69 pl. ; 27–28 cm.
NOT SEEN
In: BL; KVK; ULC.

Le grand livre des peintres, ou l'art de la peinture, considéré dans toutes ses parties, et démontré par principes; avec des réflexions sur les ouvrages de quelques bons maîtres, & sur les défauts qui s'y trouvent. Auquel on a joint les principes du dessin du même auteur / par Gérard de Lairesse ; traduit du Hollandois sur la seconde [sic!] éd. [by Hendrik Jansen] ; [underneath the pl., Bernard dir.]. - Paris : chez Moutard, 1787. - 2 vol. : pl. ; 28 cm.
§ Translated after the edition: Haarlem 1740 [No. 177.5].
Photomechanical reprint: Genève 1972 [No. 177.16].
– Vol. 1: Tome premier. - xxij, 527 p. : [31 or 33] leaves of plates.
Principes du dessin: pp. 1–48 : [4] ill.
Le grand livre des peintres: pp. 49–519 : [27] ill.
Index: p. 521.
Addenda & corrigenda: p. 527.
– Vol. 2: Tome second. - [4], 662, [2] p. : [2] leaves of plates.
MIP: pp. 609–649.
Contents: p. 650.
Index of artists: p. 657.
Addenda & corrigenda: p. 661.
§ Approbation dated, p. [1] at the back: 'A Paris, le 12 septembre 1786. Robin'.
Privilege dated, p. [1] at the back: 'Donné à Fontainebleau, le trentième jour d'Octobre l'an de grace mil sept cent quatre-vingt-six, & de notre règne le treizième. Signé, Le Begue.'
Signed, p. [2] at the back: 'A Paris, ce 7 Novembre 1786. Jansen.'
Registered, p. [2] at the back: 'A Paris, le 11 Novembre 1786, signé Nyon l'aîne, Adjoint.'
Colophon dated: 'De l'Imprimerie de P. de Lormel ... 1787'.
In: BL; BNL; HAB; KVK; RMA; UBA; UBL; ULC.

Principios da arte da gravura, traslados do Grande Livro dos Pintore de Gerardo Lairesse : livro decimoterceiro para servirem de appendice aos

principios do desenho do mesmo author, em beneficio dos gravadores do Arco do Cego / Gerard de Lairesse ; com uma est. grav. por [António Jose] Quinto. - Lisboa : na Typographia Chalcographica, Typoplastica, e Litteraria do Arco do Cego, 1801. - [4], 42, [4] : [1] fol. est. ; 19.5–22.5 cm.
Contents: p. [1] at the back.
Addenda & corrigenda: p. [3] at the back.
Stocklist: p. [4] at the back.
§ Translation of the thirteenth chapter on intaglio printmaking. Perhaps a translation after the French edition of 1787 [No. 177.13], as at the same time **Bosse** was also translated and published after the French edition of 1758 (= 1769 or later) [No. 042.11].
In: BNL; *Figueras Ferrer 1992*: 1053; FCG; RMA; *Soares 1971*, vol. 1: 39 and vol. 2: 506.

177.15

Groot schilderboek, waar in de schilderkonst in al haar deelen grondig werd onderweezen, ook door redeneeringen en prentverbeeldingen verklaard; met voorbeelden uit de beste konst-stukken der oude en nieuwe puikschilderen, bevestigd: en derzelver wel- en misstand aangeweezen / door Gerard de Lairesse ; [fec. G. v.d. Gouwen, M. Pool ... et al.] ; [del. I. Hoogsaat, Ph. Tieleman ... et al.] ; [inv. G. de Lairesse] ; [sculp. Blois ... et al.]. - Fotomechanische herdruk. - [Doornspijk] : Davaco, 1969. - 2 vol. in 1 bd. : ill. ; 21 cm.
§ Photomechanical reprint of: Haarlem 1740 [No. 177.5].
– Vol. 1: [60], 434, [33] p. : front., 51 ill.
Contents: p. [1] at the back.
– Vol. 2: 400, [28] p. : 15 ill.
MIP: pp. 369–400 : ill.
Contents: p. [1]
In: RCE; RMA; UBA; UBG; UBG; UBL; ULC; VU.

177.16

Le grand livre des peintres, ou l'art de la peinture considéré dans toutes ses parties, et démontré par principes; avec des réflexions sur les ouvrages de quelques bons maîtres, et sur les défauts qui s'y trouvent. Auquel on a joint les principes du dessin du même auteur / Gérard de Lairesse ; traduit du Hollandois sur la seconde éd. - [Photom. repr.]. - Genève : Minkoff, 1972. - 2 vol. (XXII–528, 666 p.) : 33 ill. ; 23 cm.
§ Photomechanical reprint of: Paris 1787 [No. 177.13].
NOT SEEN
In: KVK.

Lalanne (François Antoine Maxime)   178.1

Traité de la gravure à l'eau-forte / texte et planches par [François Antoine] Maxime Lalanne ; lettre-préface de Charles Blanc. - [1st ed.]. - Paris : Cadart et Luquet, 1866. - [4], VIII, 106 p. : 8 pl. ; 23.5 cm.
Suppliers: pp. 14, 90.
Address of a planisher of copper plates: p. 60.
Address of the plate printer Delâtre: p. 83.
Address of steelfacer: p. 92.
Literature: p. 95.
Contents: p. 103.
§ Title means: Treatise on etching
All *planches* are etchings. Pl. 1 and 2 after Claude Lorrain. Pl. 1 is a photogravure after the first state of pl. 2. All plates are printed by August Delâtre. For a discussion on the influence of this manual and a pedigree, see above: Manuals and their Influence – Maxime Lalanne, p. 421.
Photomechanical reprint: Egrève 2007 [No. 178.23].
1 –
Aquatint / Drypoint / Lift-ground / Line Etching / Soft-ground
2 –
Copper / Steel / Steelfacing / Zinc
3 –
Ink / Paper / Press / Printing in Black / Rubbing
5 –
Aesthetics / Art History
In: BL; *Blas Benito 1994*: 69; BN; *Bridson & Wakeman 1984*: no. B28; CCB; *Figueras Ferrer 1992*: 1053; KBR; KSM; MAK 1883, p. 291; MET; NUC–1956, vol. 312 (8×); OCLC; Priv.Coll. (2×); SBB; *Singer & Strang 1897*: nos. 241–242; UBA; UBAB.

178.2

Traité de la gravure à l'eau-forte / texte et planches par [François Antoine] Maxime Lalanne ; [avec une lettre-préface de Charles Blanc]. - Deuxième éd. - Paris : Vve Cadart, 1878. - XII, 108 p. : 1–8, [2] pl. ; 25 cm.
Supplier of etching materials: p. 15.
Plate printers in Paris: p. 86 n. 1.
Vve Cadart table model roller presses: p. 89, nt 1.
Suppliers of paper and parchment: p. 94.
Steelfacer: p. 96.
Literature: p. 99.
Contents: p. 105.
Edition: 75 copies of the edition are printed on Dutch paper.
§ With a new preface by Lalanne: pp. 1–2. References to the artist have been deleted. Chapter 8 is no longer a guided tour by Delâtre through his printshop, but through a printshop in general. The larger part of the first paragraph of this chapter is omitted.
Pl. 1 and 2 have been remade and are the reverse of pl. 1 and 2 of the first edition. Pl. 1 is a photogravure of the first state of the newly made pl. 2. Plates printed by Vve Cadart.
The texts and plates in all later editions are the same, only the addresses of suppliers, plate printers and steelfacers differ. With every new edition the text has been reset.
In: BN; NUC, vol. 312; OCLC (2×) ; Priv.Coll.; *Singer & Strang 1897*: no. 274.

Traité de la gravure a l'eau-forte / texte et gravures par [François Antoine] Maxime Lalanne ; avec une lettre-préface de Charles Blanc. - Paris : A. Quantin, 1879. - XII, 108 p. : 8, [2] pl. ; 24.5 cm.
Suppliers: pp. 15, 89, 94, 98.
Plate printers in Paris: p. 86, n. 1.
Steelfacer: p. 96.
Literature: p. 99.
Contents: p. 105.
§ This is the first edition by Quantin.
Plates [1] and [2] are added.
In: NUC–1956; OCLC (2×); Priv.Coll.; UBAB.

[Notes on etching] / John Buckland-Wright. - [London?], 1951.
In: **Lalanne** (Paris 1879) [No. 178.3].
§ Manuscript.
Language: English.
Pencil marks and occasional shorthand notes throughout the volume; longer text in shorthand on the verso of pl. 3 facing p. 69. The notes are presumably by John Buckland-Wright, who acquired this volume in 1951.
Provenance of the volume, front pastedown: 'Hugh Paton circa 1879'; 'JBW 4–12–51'. For Buckland-Wright see: **Buckland-Wright** (London 1953) [No. 053]. For Paton see: Paton (1892–1894) [No. 543] and **Paton** (London 1895) [No. 232].
1 –
Line Etching
In: Priv.Coll.

Traité de la gravure à l'eau-forte / texte et gravures par [François Antoine] Maxime Lalanne ; avec une lettre-préface de Charles Blanc. - Paris : A. Quantin, 1881. - [2], XII, 108 p. : 8, [2] pl. ; 24.5 cm. - (Bibliotheque de l'art et de la curiosité).
Plate printers: p. 86.
Supplier of parchment: p. 94.
Steelfacer: p. 96.
Literature: p. 99.
Contents: p. 105.
§ This is the second edition by Quantin.
In: *Blas Benito 1994*: 69; KB; OCLC; RAA.

Traité de la gravure a l'eau-forte / texte et planches par [François Antoine] Maxime Lalanne ; avec une lettre-préface à Lalanne par Charles Blanc. - Troisieme éd. - Paris : Vve Cadart, [c. 1885?]. - [2], XII, 108 p. : [2], 8 pl. : 24.5–25.5 cm.
Plate printers: p. 86.
Literature: p. 99.
Contents: p. 105.
In: MET; NUC–1956; OCLC; RMA.

Traité de la gravure a l'eau-forte / texte et planches par [François Antoine] Maxime Lalanne ; [lettre-préface à Lalanne par Charles Blanc]. - Quatrième éd. - Paris : Vve Cadart, [c. 1887/1888?]. - [2], XII, 108 p. : [2], 8 pl. : 25 cm.
Suppliers: pp. 15, 86, 89, 94.
Plate printers: p. 86.
Literature: p. 99.
Contents: p. 105.
Edition: 75 copies of the edition are printed on Dutch paper.
§ Without year. This is the fourth edition by Cadart.
In: MBvB.

Traité de la gravure a l'eau-forte / texte et planches par [François Antoine] Maxime Lalanne ; [lettre-préface à Lalanne par Charles Blanc]. - [5th ed.]. - [Paris?] : […], 1892.
NOT SEEN

Traité de la gravure a l'eau-forte / texte et planches par [François Antoine] Maxime Lalanne ; avec une lettre-préface de Charles Blanc. - Sixième éd. - Paris : Lamour, 1897. - [4], [2], XII, 106 p. : 1, 1, 3–8, [2] pl. ; 24.5 cm.
Advertisement: p. [5].
Suppliers: pp. 16, 87, 92.
Steelfacer: p. 93.
Plate printers in Paris: p. 84, n. 1.
Literature: p. 97.
Contents: p. 103.
§ Advertisement of Lamour pasted in between pp. [4] and 1.
In: BN; MVvG; NUC–1956, vol. 312; Priv.Coll.

Traité de la gravure a l'eau-forte / texte et planches par [François Antoine] Maxime Lalanne ; avec une lettre-préface de Charles Blanc. - Paris : Berville, 1897. - XII, 106 p. : pl. ; 24 cm.
§ Probably the same edition as the one above, but traded by another company. OCLC: 'Publishing information from label mounted on title-page.'
NOT SEEN

In: OCLC.

Traité de la gravure a l'eau-forte / texte et planches par [François Antoine] Maxime Lalanne ; avec une lettre préface de Charles Blanc ; [woodengr. by F. de Ruaz, Watson]. - Septième éd. - Paris : Lefranc, 1920. - [4], XII, 106 p. : 1, 1, 3–8, [2] pl., [31] woodengr. ; 25 cm. - (Bibliothèque artistique).
Plate printer: p. 84.
Literature: p. 97.
Contents: p. 103.
Stocklist: backside cover.
§ The text is illustrated with wood engravings of tools and machines supplied by Lefranc.
In: [BN?]; DBI-VK; Priv.Coll.

A treatise on etching / text and plates by [François Antoine] Maxime Lalanne ; transl. from the second French ed. by S[ylvester] R[osa] Koehler ; with a preface, an introductory chapter and notes by the transl. [Sylvester Rosa Koehler] ; [pl. A and B by W.M. Lansil]. - [1st] authorized American ed. - Boston, Mass. : Estes and Lauriat, 1880. - xxx, 79, [3] p. : front., pl. A–[B], 1a, 2, 1b, 3–8, [2], [2] vign. ; 25.5–26 cm.
Contents: p. ix.
Suppliers: pp. xiiI–xv, 57, 63, 69.
List of plates: p. xxiii.
Plate printers: p. 69.
Steelfacer: p. 73.
Literature: p. 75.
Stocklist: p. [2].
§ Translation of the edition: Paris 1878.
With a new title page, a preface by the translator and additional 'Notes by the translator'.
The text of the English translation is the same in all American and English editions because the same type has been used in printing.
Koehler's preface has his address, p. vii: 'Beech Glen Avenue, Roxbury, Boston'.
The same plates as in the second edition (Paris 1878), added are plates A and [B] by W. Lansil dated '1879'. Plate 1a is a photolithograph of the first state of plate 2, plate 1b is printed with *retroussage* from the same plate as plate 2. The '1b' is scratched into the plate, but it is not very clear and could also be read as 'II'.
The Lalanne plates are printed by 'Vve A. Cadart' and are on thinner paper than the Lansil plates, which may have been printed by another plate printer.
All plates are numbered with Roman numerals in the list of plates, but on the plates themselves the original numbers in Arabic numerals are still visible.
The two vignettes are line-block reproductions after vignettes in **Bosse** (Paris 1758) [No. 042.11].
Photomechanical reprint: New York 1981 [No. 178.22].
Announcement: *American Art Review*, 2 (1880) 8: 81, '100 copies, with plates on India paper, one half roan, $ 6.50'. The normal price was $ 3.50.
In: BL; BAI-1901, vol. 61: 256; BLBS; *Levis 1910*: 55; *Levis 1912*: 106; MET; NUC–1956, vol. 312 (27×); OCLC (80×); Priv.Coll. (2×); *Singer & Strang 1897*: no. 290; ULC.

A treatise on etching / text and plates by [François Antoine] Maxime Lalanne ; transl. from the second French ed. by S[ylvester] R[osa] Koehler ; with an introductory chapter & notes by the transl. [Sylvester Rosa Koehler] ; [pl. A and B by W.M. Lansil]. - [1st] authorized [English] ed. - London : Sampson Low, Marston, Searle, & Rivington, 1880. - xxx, 79 p. : front., pl. A–[B], 1a, 1–8, [1], [2] ill. ; 25 cm.
Contents: p. ix.
List of illustrations: p. xxiii.
Suppliers: pp. xiii, 57, 63, 69.
Plate printers: p. 69.
Steelfacer: p. 73.
Literature: p. 75.
With advertisement.
§ With a different title page and a different preface by the translator aimed at an English audience.
Koehler's preface is dated, p. vii: 'Beech Glen Avenue, Roxbury, Boston, July, 1880'.
Review: *American Art Review*, 2 (1880) 3: 127.
Review: *The Art-Journal*, new series (1881): 64.
NOT SEEN
In: BL; *Blas Benito 1994*: 69; BLBS; *Bridson & Wakeman 1984*: no. B28; DBI-VK; NUC–1956, vol. 312 (2×); OCLC; ULC.

A treatise on etching / text and plates by [François Antoine] Maxime Lalanne ; transl. from the second French ed. by S[ylvester] R[osa] Koehler ; with an introductory chapter & notes by the transl. [Sylvester Rosa Koehler] ; [letter by Charles Blanc] ; [pl. by W.M. Lansil]. - 2nd English ed. - London : Sampson Low, Marston, Searle, & Rivington, 1884. - xxx, 79 p. : front., pl. A–[B], 1a, 1–8, [1], [2] ill. ; 25 cm.
NOT SEEN
In: BL; COPAC.

A treatise on etching / text and plates by [François Antoine] Maxime Lalanne ; transl. from the second French ed. by S[ylvester] R[osa] Koehler ; with an introductory chapter & notes by the transl. [Sylvester Rosa Koehler] ; [letter by Charles Blanc] ; [pl. A and B by W.M. Lansil]. - Third [English] ed. - London : Sampson Low, Marston, Searle & Rivington, 1884. - xxx, 79, [4] p. : front., pl. A–[B], pl. 1a, 1, 1, 3–8, [1] pl., [3] ill. ; 25.5 cm.
Contents: p. ix.
List of illustrations: p. xxii.
Suppliers: pp. xiii, 57, 63, 69.
Plate printers: p. 69.
Steelfacer: p. 73.
Stocklist: p. [1] between pp. 70 and 71.

Advertisement: p. [2] between pp. 70 and 71, p. [3] between pp. 74 and 75 : [2] ill.
Literature: p. 75.
§ With a new title page.
The advertisement for the firm of Roberson in **Hamerton** (Boston 1881) [No. 133.3] is the same as in the present edition.
In: *Bridson & Wakeman 1984*: no. B28; NUC–1956, vol. 312; Priv.Coll.

178.16

A treatise on etching / text and plates by [François Antoine] Maxime Lalanne ; transl. from the second French ed. by S[ylvester] R[osa] Koehler ; with an introductory chapter and notes by the transl. [Sylvester Rosa Koehler] ; [pl. A and B by W.M. Lansil]. - Authorized [4th English] ed. - London : Sampson Low, Marston & Company, 1892. - xxx, 79, [4] p. : front., pl. A–[B], pl. 1a, 1, 1, 3–8, [1] pl., [3] ill. ; 25.5 cm.
Contents: p. ix.
List of illustrations: p. xxiii.
Suppliers: pp. xiii, 57, 63, 69.
Plate printers: p. 69.
Steelfacer: p. 73.
Literature: p. 75.
§ The title page is printed on different paper than the text.
In: *Bridson & Wakeman 1984*: no. B28; OCLC; Priv.Coll.

178.17

A treatise on etching / text and plates by [François Antoine] Maxime Lalanne ; transl. from the second French ed. by S[ylvester] R[osa] Koehler ; with a preface, an introductory chapter and notes by the transl. [Sylvester Rosa Koehler] ; [pl. A and B by W.M. Lansil]. - Authorised [2nd] American ed. - Boston : The Page Company, [1926?]. - xxx, 79 p. : front., pl. A–[B], 1a, 1, 1, 3–8, [2], [2] vign. ; 24.5 cm.
Contents: p. ix.
Suppliers: pp. xiv–xv, 57, 63, 69
List of plates: p. xxiii.
Plate printers: p. 69.
Steelfacer: p. 73.
Literature: p. 75.
§ The text on p. xiii has been adapted and reset.
The cover and the quality of the impressions are the same as the edition: Boston : W. & G. Foyle, [s.a.].
In: BAI-1901, vol. 61: 256; BL; *Blas Benito 1994*: 69; COPAC; OCLC; Priv.Coll.

178.18

A treatise on etching / text and plates by [François Antoine] Maxime Lalanne ; transl. from the second french ed. by S[ylvester] R[osa] Koehler ; with an introductory chapter and notes by the transl. [Sylvester Rosa Koehler] [pl. A and B by W.M. Lansil]. - Reissue. - London : W. & G. Foyle, [1926?]. - xxx, 79 p. : front., pl. A [and B], 1a, 1, 1, 3–8, [1] pl., [1] reprod., [1] woodengr. ; 24.5 cm.
Contents: p. ix.
List of illustrations: p. xxiii.
Suppliers: pp. xiv–xv, 57, 63, 69.
Plate printers: p. 69.
Steelfacer: p. 73.
§ The plates are thinly printed.
In: BL; OCLC; Priv.Coll.

178.19

A treatise on etching = Traité de la gravure à l'eau-forte / text and plates by = texte et planches par [François Antoine] Maxime Lalanne ; transl. and arranged by = éditeur J.A. Delaborde- - [Deluxe ed.]. - Paris : Société des Beaux-Arts (Editeurs); New York ; Cincinnati : Yorston (Importers), [c. 1880?]. - [1], 283 p. : 8 pl. ; 23 cm + portfolio with 15 etch.
Contents of treatise: p. 3.
Table des matieres: p. 4.
Table of etchings = Table des planches: p. 281.
List of fifteen modern etchings, in portfolio: p. 282.
Table de quinze eaux-fortes moderne, en portefeuille: p. 283 at the back.
§ Every opening has English text on the left and French text on the right on facing pages. The French text is identical to the text of the second French edition (Paris 1878), except for some diacritical marks. Pp. 255–258 give the names of three artists only mentioned in the first edition (Paris 1866, p. 87). The English translation by Delaborde has no connection with Koehler's translation.
Plates 1 and 2 are printed from the same copper plates as those in the first French edition (Paris 1866). The other plates are the same as in all other editions. The plates are printed by 'Imp. Delmoy'.
Published in 1887 or shortly afterwards because the auction of the Stewart collection in New York in 1887 and the *Exposition Universelle* (both pp. 120–121), and the *Salon* in Paris in 1887 (pp. 215–216) are mentioned.
The publication is accompanied by a portfolio with fifteen etchings, as mentioned on the title pages, that are discussed by Delaborde at the end of each chapter.
The copies of this edition are numbered.
A preface, introduction or any other reference explaining the reason for this bilingual edition is absent.
Delaborde (pp. 22–24) speaks highly of manually made reproductions.
The portfolio with 15 etchings is NOT SEEN.
In: JS; NUC–1956, vol. 312 (2×); OCLC.

178.20

A treatise on etching = Traité de la gravure à l'eau-forte / text and plates by [François Antoine] Maxime Lalanne ; transl. and arranged by J.A. Delaborde. - Paris : Bureau d'administration ; Boston : Jessup, [c. 1880?]. - 283 p. : 8 pl. ; 23 cm.
NOT SEEN
In: NUC–1956, vol. 312 (4×); OCLC (6×).

A treatise on etching = Traité de la gravure à l'eau-forte / text and plates by = texte et planches par [François Antoine] Maxime Lalanne ; transl. and arranged by = éditeur J.A. Delaborde. - Paris : Barrie Frères ; Philadelphia : George Barrie & Son, [c. 1880?]. - xiv, 280 p. : front., 8 pl. ; 20.5–23 cm.
Contents of treatise: p. viii.
Table des matières: p. ix.
Examples by the author = Les échantilllons par l'auteur: p. x.
Celebrated etchings referred to in the treatise: p. xii.
Eaux-fortes célèbres avant rapport avec le traité: p. xiii.
§ Identical to the edition: Paris : Société des Beaux-Arts (Editeurs); New York ; Cincinnati : Yorston (Importers); except that the various lists are bound at the beginning here. Without mention of the 'fifteen examples of modern etchings', thus published without a portfolio which is replaced by the list of 'Celebrated etchings referred to in the treatise'.
Plates printed by 'Imp. Delmoy'.
In: OCLC; Priv.Coll.

The technique of etching / [François Antoine] Maxime Lalanne ; transl. by S[ylvester] R[osa] Koehler ; ed. and with an introduction [and a preface] by Jay M. Fischer. - Republ. - New York : Dover ; Toronto ; General Publishing Company ; London : Constable and Co., cop. 1981. - xxxiv, [2], 67, [18] p. : 27 ill. ; 21.5 cm.
Introduction: p. VII.
With the translation preface by Lalanne from 1866: p. xxi.
With the translation preface by Lalanne from 1878: p. xxiii.
Letter of Charles Blanc to Lalanne: p. xxv
Contents: p. xxxi.
List of illustrations: p. [1] following p. xxxiv.
Literature: p. 63.
Stocklist: insides front- and backcover, p. [4] at the back.
With literature.
ISBN 0-486-24182-3 (softcover)
§ The preface by Fischer concerns Lalanne and his contemporaries, Lalanne's treatise and its meaning. Missing are Koehler's preface, his 'Notes by the translator' and plates A and B by Lansil.
Photomechanical reprint of: Boston 1880 [No. 178.12].
The illustrations are reproduced after the plates in the third Cadart edition: Paris, [s.a., 188?].
In: BIP+; BL; *Blas Benito 1994*: 69; *Bridson & Wakeman 1984*: no. B28; BNB77; NCC; OBA; OCLC (14×); Priv.Coll.; ULC.

Traité de la gravure à l'eau-forte / Maxime Lalanne. - Reproduction en fac-similé. - Saint-Égrève : Émotion primitive, 2007. - VIII, 106 p. : ill. ; 20 cm.
ISBN 978-2-35422-123-2
§ Photomechanical reprint of: Paris 1866 [No. 178.1].
NOT SEEN
In: KVK.

Making prints : shop talk on the graphic arts / by J[ulius] J[ohn] Lankes, C[oy] A[von] Seward, Paul V. Ulen, Ernest W[illiam] Watson ; ed. and preface by Ernest W[illiam] Watson. - New York ; Pittsburg : Scholastic Publications, 1936. - 95 p. : ill. ; 28.5 cm.
MIP: Aquatint, etching, drypoint / Paul V. Ulen. - Pp. 48–77 : [6] photogr., [18] reprod.
Literature: p. 60.
Stocklist: p. 93.
With suppliers.
With literature.
§ Cover title: Making prints. How to make linoleum prints, lithographs, woodcuts, wood engravings, aquatints, etchings, drypoints
Title page: 'Illustrated by prize-winning prints from Scholastic Award competitions.'
Course book for extramural studies.
1 –
Aquatint / Drypoint / Line Etching
2 –
Zinc
3 –
Paper / Press / Printing in Black
4 –
Lithography / Wood Engraving / Woodcut
In: MET; OCLC; Priv.Coll.

Laraya (Tomás Gutiérrez)
See: **Gutiérrez Laraya** (Tomás) [No. 131].

Coloritto; or the harmony of colouring in painting: reduced to mechanical practice, under easy precepts, and infallible rules; together with some colour'd figures, in order to render the said precepts and rules intelligible, not only to painters, but even to all lovers of painting = l'Harmonie du coloris dans la peinture; reduite en pratique mecanique et à des regles sures & faciles: avec des figures en couleur, pour en faciliter l'intelligence, non seulement aux peintres, mais à tous ceux qui aiment la peinture / by J[ames] C[hristopher] Le Blon = par J[acque] C[hristoph] Le Blon; [poem by] C.A. du Fre[s]noy ; [english'd by James Anderson?]. - [London] : [Le Blon], [1725]. - VIII, 27, [1] p. : 5 mezzotints, partly printed in colour, partly hand-coloured ; 28 cm + Appendix: 7, [1] p. : 4 mezzotints, partly printed in colour, partly hand-coloured.

§ Although this is not a manual on intaglio printmaking, it is included in the present bibliography because the colour mixing theory discussed in this treatise is the basis for Le Blon's manner of trichromatic printing, ie in blue, red and yellow with a possible fourth black or blue plate. With Le Blon modern colour printing began and the principles of his process are still in use today.

Every opening with English text on the left and French text on the right on facing pages.

Although it is often suggested that the colour plates are printed in Le Blon's style of printing with three colours in blue, yellow and red, this is not the case. The mezzotint heads of the girl are partly printed in black ink only, and partly printed from two plates in black and a purplish-red (carmine?) ink. The palettes are printed in brown. All other colours are brushed in by hand.

The edition was twenty to thirty copies, see Stuttgart 1985 [No. 180.7]: 97. With reference to: 'Art. LXXXII', *Memoires pour l'historie des sciences et des beaux arts* (= *Journal de Trevoux*), (1737, Aug.): 1435–1444.

Not all copies have the appendix.

The order of the various parts differs per copy. Based on the foliation the following order seems the most logical one: dedication to Walpole (p. II–IV, quires a-b), the title pages (pp. 2–3, quire A), the poem by Fresnoy (p. 3), the main text (pp. 6–27, quires B-D), the Appendix. Lilien reproduces the title pages first, followed by the poem, the dedication, the text and the Appendix; Stuttgart 1985 [No. 180.7]: 178–225. Miedema places the dedication (fol. a1, a2, b1, b2) in between fol. A2v and A3r; Leiden 2006 [No. 180.8]: 250.

Photomechanical reprint: Stuttgart 1985 [No. 180.7].

Transcription: Leiden 2006 [No. 180.8].

NB: Full references are given here because of the importance of this work.

1 –

Mezzotint

3 –

Multiple-plate Printing / Printing Polychrome

5 –

Aesthetics

In: BAA, Collection Doucet, 111 P 7 Liber rarissime (without Appendix); BL, 561* d 19 (with Appendix); *Blas Benito 1994*: 69; BLBS (with Appendix); BLO, Arch d.9 (without Appendix); BM, Dep. of Prints and Drawings, 166.b.9; *Bridson & Wakeman 1984*: nos. B80, B81; ESTC: no. t115966 (2×); *Figueras Ferrer 1992*: 1054; KBK, 81 I–238 (with Appendix); LC-RC, ND 1486 L4 Ros. 1741 (without Appendix, provenance Howard Coppuck Levis, see: *Levis 1912*); **Le Blon** (Stuttgart 1985): 112–113 (13×, of which 2 lost, 2 untraceable and without the copies BM, NYPL and UBA); Dr. G. Ledoux-Lebard, Paris (2×, both with Appendix); *Levis 1912*: 179–181; MET, Dep. of Prints and Photographs, Accession No. 21.68.3; NG, Scientific Department (without Appendix); NUC–1956; NYPL; OCLC; WC, Royal Library, (without Appendix); *Singer & Strang 1897*: nos. 31–32 (1722), 33 (1730), 35 (1737); UBA, ZKW (with Appendix, no shelfmark, provenance Horace Walpole > William Stirling > Lettergieterij Amsterdam); V&A, London, 94 A 115 (without Appendix); Yale Center for British Art, New Haven Conn.

180.2

L'art d'imprimer les tableaux. Traité d'après les ecrits, les opérations & les instructions verbales de J[acque] C[hristophe] Le Blon / [éditeur Antoine Gauthier de Montdorge] ; préface de l'éditeur ; [poem by C.A. du Fresnoy] ; J[ean] Robert delin. ; P[ierre] F[rançois] Tardieu sculp. - [1st ed.]. - Paris : chés P.G. Le Mercier : Jean-Luc Nyon : Michel Lambert, 1756. - xxv, 26–180, [4], *vj*, [2] p. : 3 folding pl., of which [1] in colour ; 20–21 cm.

The revised text of Coloritto: p. xiii–xxv, 1–71.

MIP: pp. 85–134.

Subject index: p. 135.

Subject index on **Bosse** (Paris 1745) [No. 042.8]: p. 159.

Contents of pt. 1: p. *i*.

Contents of pt. 2: p. *ij*.

Contents of subjects in **Bosse** (Parijs 1745) [No. 042.8] related to the present edition: p. *iv*.

Addenda & corrigenda: p. [2] at the back.

§ Printer: P.G. Le Mercier.

Approbation, p. [1] at the back: 'A Paris ce 2e Juin 1756. Signés, Duhamel du Monceau. [Antoine] Gaultier [sic!] de Montdorge'.

Approbation, p. [2] at the back: 'A Paris, ce trois Juin mil sept cent cinquante-six. Signé, Giber'.

Royal privilege, p. [3] in the middle: 'Donné à Versailles le vingt-troisiéme jour du mois d'Août, l'an de grace mil sept cent cinquante-six, & de notre Regne le quarante-uniéme. Par le Roy en son Conseil Signé, Le Begue.'

Registration, p. [4] in the middle: 'A Paris le 31 Août 1756. Signé, Didot, Syndic'.

Printing, p. [4] in the middle: 'De l'Imprimerie de P.G. Le Mericier, 1756'.

The second plate is designed by Jean Robert and executed by Pierre Tardieu, both former apprentices to Le Blon; **Le Blon** (Stuttgart 1985) [No. 180.7]: 71.

Announcement: **Robert 3** (1756) [No. 568]: 211.

– Pt. 1: L'harmonie du coloris dans la peinture / réduite en pratique méchanique, & à des régles sures & faciles par J[acque] C[hristophe] Le Blon. - Nouvelle ed. - P. xiii–xxv, 26–72.

§ The text of Coloritto, openings with English text on the left and French text on the right on facing pages; the French is edited by De Montdorge.

The Latin poem by C.A. du Fresnoy (p. xiii) is not translated in English and French as it is in the original edition.

Without the five plates showing the different stages of the girl's head.

Without the Appendix.

Reprint: Amsterdam 1916 [No. 180.4].

Photomechanical reprints: Genève 1973 [No. 180.5]; New York 1980 [No. 180.6].

– Pt. 2: Opérations nécessaires pour graver et imprimer des estampes, a l'imitation de la peinture, selon le systême de J[acque] C[hristophe] Le Blon / [Antoine Gauthier de Montdorge]. - P. 73–134 : 3 pl.

§ Text in French only.

De Montdorge compiled the instructions on Le Blon's trichromatic printing process after the now lost report of the royal committee (of which De Montdorge was a member) dated 12 October 1738, but possibly written before 1 April 1738.

Some parts of this report he had already published, see: **Montdorge 1** (1749) [No. 521].

An abridged version of this text was published in the 'Encyclopédie' a year later; *Diderot & D'Alembert 1751–1781*, vol. 7 (1757), pp. 899–903: 'Gravure en couleurs, à l'imitation de la peinture'. 'Gravure en maniere noire'. 'Gravure en taille-douce pour imprimer en couleurs'. Concerning its author: '[p. 899] Quant aux trois articles qui suivent, ils sont tels que nous les avons reçus de M. de Montdorge', '[p. 903] Ces articles sur la gravure

en couleurs & la gravure en maniere noire sont de M. de Montdorge'.

The three plates concern a palette, done in mezzotint and printed in brown with the colours brushed in, the tools for mezzotint and the grid for mezzotint.

1 –

Mezzotint

2 –

Copper

3 –

Ink / Multiple-plate Printing / Print behind Glass / Printing à la Poupée / Printing Polychrome

5 –

Aesthetics / Art History

In: BL; *Blas Benito 1994*: 69; BLBS; BN; *Börsenverein 1885*; *Bridson & Wakeman 1984*: no. B80; BS ('Nicht mehr vorhanden'); DBSM; ESTC: no. t115967; *Figueras Ferrer 1992*: 1047, 1053; GMM; *Levis 1912*: 181–182; MBvB; MET; NCC; NG; NSUG; NUC–1956; OCLC; RMA; SBB; *Singer & Strang 1897*: no. 44; UBH; UBL; UBU; ULC.

180.3

L'art d'imprimer les tableaux. Traité d'après les ecrits, les opérations & les instructions verbales / de J[acque] C[hristophe] Le Blon ; préface de l'éditeur [= Antoine Gauthier de Montdorge]; [gedicht door C.A. du Fresnoy]; J[ean] Robert delin. ; P[ierre] F[rançois] Tardieu sculp. - Seconde éd. - Paris : chez Vente, 1768. - xxv, 26–180, *vj*, [2] p. : 3 folding pl., of which [1] in colour ; 21 cm.

The revised text of *Coloritto*: p. xiii–xxv, 1–71.

MIP: pp. 85–134.

Subject index: p. 135.

Subject index on **Bosse** (Paris 1745) [No. 042.8]: p. 159.

Contents of pt. 1: p. *i*.

Contents of pt. 2: p. *ij*.

Contents of subjects in **Bosse** (Paris 1745) [No. 042.8] related to the present edition: p. *iv*.

Addenda & corrigenda: p. [2] at the back.

§ Concerning this new edition, p. [3] at the beginning: 'Avis Sur cette nouvelle edition'.

Approbation of 2 June 1756, p. [1], at the back: 'A Paris, ce 2e Juin 1756. Signés, Duhamel du Monceau. Gaulthier de Montdorge.'

Approbation of 23 February 1768, p. [2], at the back: 'A Paris, ce 23 Février 1768. Signé, Gibert.'

Without the original French title and the royal privilege.

This is a remainder of the 1756 edition with a new title page and *Avis*, and bound in different order. The main text is the same, with the same errors in typesetting and the identical damages to the type. The short title (before the actual title page), the original title page, the royal privilege, the addenda & corrigenda and the blank folia are taken out. Quire 'a' is moved from the back to the front. The 1756 approbation has been reset and a new approbation by Gibert added. The year of publication on the title page is '1768' and the approbation by Gibert is dated '23 February 1768'.

In: BL; DBI-VK; *Levis 1912*: 181–182; NUC–1956; OCLC; UBU; *Singer & Strang 1987*: no. 56.

180.4

Coloritto : bijdrage tot de geschiedenis van de kunst om in drie kleuren te drukken / met een herdruk van het boekje van J.C. Le Blon ; voorzien van aanteekeningen door N[icolaas] G[erhardus] van Huffel. - Amsterdam : [Van Huffel], gedrukt in 1916. - 37 p. : 16 afb., of which [7] in colour ; 23.5 cm.

The 1756 English text of Coloritto: pp. 23–37.

With literature

Edition: 100 copies.

§ Title means: Coloritto: contribution to the history of the art of printing in three colours

The *afbeeldingen* are reproductions of a set of colour proofs of a print, depicting a human heart, by Jan Ladmiral done in Le Blon's trichromatic process, without a black plate (No. 13) and for comparison with a black plate (No. 14). Two reproductions are pasted into the text, the other fourteen are mounted; the whole is kept in a folder.

Reprint of the English text of Coloritto in: Paris 1756 [No. 180.2].

Announcement: N.G. van Huffel, undated announcement in copy UBL-KHI. Van Huffel explains that he intends to continue the series discussing the colour printing processes by Johannes Teyler, Cornelis Ploos van Amstel, Bernard Schreuder, François Janinet, M. Descourtis and others. The only other volume in the series realised is the one about Cornelis Ploos van Amstel; *Van Huffel 1921*.

In: CCB; ENS; KABK; KB; KUB; KVB; MBvB; NCC; MMW; NUC–1956; OCLC; Priv.Coll.; RMA; UBA (3×); UBG; UBL-Boerhaave; UBL-KHI.

180.5

L'art d'imprimer les tableaus / Jacques-Christoph Le Blon. - Réimpression. - Genève : Minkoff Reprint, 1973. - [2], xxv, 26–180, [4], *vj*, [2] p. : 3 pl. ; 22 cm.

MIP: pp. 85–134.

Subject index: p. 135.

Subject index to **Bosse** (Paris 1745) [No. 042.8]: p. 159.

Contents of pt. 1: p. *i*.

Contents of pt. 2: p. *ij*.

Contents of subjects in **Bosse** (Parijs 1745) [No. 042.8] related to the present edition: p. *iv*.

Addenda & corrigenda: p. [2] at the back.

ISBN 2-8266-0091-5 (softcover)

§ Photomechanical reprint of: Paris 1756 [No. 180.2].

The *planches* are bound between pp. 134 and 135.

In: *Blas Benito 1994*: 69; CCB; DBI-VK; *Figueras Ferrer 1992*: 1054; NCC; UBA; OCLC; UBH; UBU.

180.6

Presenting a facsimile edition of Coloritto by J[acque]-C[ristophe] Le Blon, 1667–1741, inventor and developer of the red-yellow-blue theory of color printing (ca 1720) / with an introduction by Faber Birren. - New York : Van Nostrand Reinhold, 1980. - XVII, [3], XXV, 26–71, [7] p. : front, vign. ; 20–21 cm.

Literature: p. X, XI, [2] at the beginning.

List of works by Faber Birren: backside paper cover.
ISBN 0-442-24723-0 (hardcover)
§ Photomechanical reprint of: Paris 1756 [No. 180.2].
Reproduction of the text and of the palette only, which is reproduced on the front and back flyleafs.
Review: J. Gage, 'Printing Coloured Pictures', in *Art History*, 4 (1981) (Dec.): 470–474.
Lit.: **Le Blon** (Stuttgart 1985) [No. 180.7]: 107–111.
In: BL; *Bridson & Wakeman 1984*: no. B80; MMW; OCLC; UBH; ULC.

<div align="right">180.7</div>

Jacob Christoph Le Blon 1667–1741 : inventor of three- and four colour printing / Otto M[agnus] Lilien. - Stuttgart : Hiersemann, 1985. - 223, [5] p. : 57, [9] reprod., of which [16] in colour ; 24.5 cm. - (Bibliothek des Buchwesens ; 9).
Contents: p. 5.
List of copies of Coloritto: p. 112.
List of sources: p. 137.
Literature: p. 147.
List of illustrations: p. 154.
Index: p. 157.
Advertisement: p. [4].
MIP: pp. 178–223, [1–2] : VIIII Fig.
ISBN 3-7772-8507-2 (hardcover)
§ Pp. 178–223, [1–2] is a reduced photomechanical reprint of: London 1725 [No. 180.1], without the blank pages but including the Appendix of which all colour plates are reproduced in b/w.
Review: J. Gage, 'Jacob Christoph Le Blon', in *Print Quarterly*, 3 (1986) 1: 65–67.
Review: 'Otto M. Lilien bringt Jacob Christoph Le Blons Leben und Arbeit wieder in Erinnerung', in *Der Polygraph*, 39 (1986) 20: 1992–1999.
In: BL; DNB-F; DBI-VK; DNB-L; GBR; KB; MBvB; NCC; NSUG; OCLC; PBM; Priv.Coll. (2×); RMA; SAB; UBA (2×); UBG; UBH; UBL; UBN; UBU; ULC.

<div align="right">180.8</div>

Denkbeeldig schoon : Lambert ten Kates opvattingen over beeldende kunst : tekstuitgave met commentaar / door Hessel Miedema. - Leiden : Primavera Pers, 2006. - 2 vol. : ill. ; 30.5 cm.
ISBN 90-5997-035-7 (hardcover)
ISBN 978-90-5997-035-9 (hardcover)
– Vol. 1: De briefwisseling met Hendrik van Limborch. - viii, 308 p. : front., [48] fig.
Contents: p. vii.
Literature: p. 16.
Index: p. 242.
– Vol. 2: Commentaar en appendix. - xii, 311 p. : front., [18], 57 fig.
Literature: p. vii.
Text of Coloritto (London 1725) [No. 180.1]: pp. 250–269.
Index: p. 271.
§ With an annotated transcription of the English and French texts of Coloritto (London 1725) [No. 180.1]; openings with English text on the left and French text on the right on facing pages.
In: KB; Priv.Coll. (2×); UBA; VU.

Le Clerc (Sébastien)
See: **Bosse** (Paris 1701) 1st issue [No. 042.6].
See: **Bosse** (Paris 1701) 2nd issue [No. 042.7].
See: **Le Comte** (Florent) [No. 181].

<div align="right">**Le Comte** (Florent)   181.1</div>

Cabinet des singularitez d'architecture, peinture, sculpture et graveure. Ou introduction à la connoissance des plus beaux arts figurés sous les tableaux, les statues & les estampes / Florent le Comte. - [1st ed.]. - Paris : Nicolas le Clerc, 1699–1700. - 3 vol. : ill. ; 17 cm.
Addenda & corrigenda for all volumes: vol. 3, p. 302.
With stocklists.
§ Title means: Cabinet of the singularities of architecture, painting, sculpture and engraving. Or introduction of the knowledge of the fine arts depicted in paintings, statues and prints
Approbation: 9 April 1699.
Royal privilege: 23 April 1699.
Registration: 25 May 1699.
The three volumes have the same texts of approbation, royal privilege, registration and stocklists. The dates of printing differ per volume.
All frontispieces are etchings, all illustrations are woodcuts.
Photomechanical reprint: Genève 1972.
– Vol. 1: Madrigal sur le sujet M.R. fecit ; frontispice L[ouis] M[ichel] Dume[s]nil pinx. ; Bern[ard] Picart scu. - Paris : chez Nicolas le Clerc, 1699. - [72], 188, 222, [5] p. : [1] front., [1] portrait, [3] vign., [3] pl.
Addenda & corrigenda: p. [21].
Stocklist: p. [24].
MIP: pt. 1, pp. 138–156.
Appearance: pt. 1, pp. 144–156.
Contents: p. [1] at the back.
With literature.
§ Approbation, p. [23]: 'Donné à Versailles le 9. Avril 1699. Oudinet'.
Royal privilege, p. [23]: 'donne à Paris le vingt-troisiéme Avril 1699'.
Registration, p. [24]: 'Registré sur le Livre de la Communauté des Imprimeurs & Libraires. A Paris ce 25. May 1699. C. Ballard, Syndic.'

Printing completed, p. [24]: 'Achevé d'imprimer pour la premiere fois le 6. Aoust 1699. aux dépens de l'Auteur, & le vend 45. s.'

This is not so much a technical manual as a reference work for collectors and art lovers, more particularly prints, with some technical information about paintings, glass and prints. The part on the appearance of an engraving (pt. 1, pp. 138–156) is taken from **Bosse** (Paris 1745) [No. 042.8]: 106–113.

The plates show marks and monograms of engravers.

– Vol. 2: Tome II / frontispice Marin Desmarais del. ; Bern[ard] Picart scu. - Paris : chez Etienne Picart, Nicolas le Clerc, 1699. - [26], 356, 139 p. : front., [2] pl.

Stocklist: p. [8].

Contents: p. [15].

§ Marin Desmarais is probably Martin Desmarest (Desmares) (c.1650; TB 26: 395, col. 2).

Approbation, p. [7]: 'Donné à Versailles le 9. Avril 1699. Oudinet.'

Royal privilege, p. [7]: 'donne à Paris le vingt-troisiéme Avril 1699.'

Registration, p. [8]: 'Registré sur le Livre de la Communauté des Imprimeurs & Libraires. A Paris ce 25. May 1699. C. Ballard, Syndic.'

Printing completed, p. [8]: 'Achevé d'imprimer pour la premiere fois le 25. Octobre 1699. aux dépens de l'Auteur, & le vend 45. s.'

The plates show marks and monograms of engravers.

– Vol. 3: Troisie'me & dernier volume. - Paris : Etienne Picart, Nicolas le Clerc, 1700. - [36], 284, 302 p. : front., [3] vign.

Stocklist: p. [8].

Contents: p. [13].

MIP: pt. 2, pp. 19–25.

Addenda & corrigenda: pt. 2, p. 302.

§ Approbation, p. [7]: 'Donné à Versailles le 9. Avril 1699. Oudinet.'

Royal privilege, p. [7]: 'donne à Paris le vingt-troisiéme Avril 1699'.

Registration, p. [8]: 'Registré sur le Livre de la Communauté des Imprimeurs & Libraires. A Paris ce 25. May 1699. C. Ballard, Syndic.'

Printing completed, p. [8]: 'Achevé d'imprimer pour la premiere fois le 29. Decembre 1699. aux dépens de l'Auteur, & le vend 45. s.'

Intaglio printmaking is about the technique of etching. The recipe for etching ground (pt. 2, p. 20) is the same as in **Bosse** (Paris 1645) [No. 042.2]: 9, except that only half of all amounts of ingredients are given. The recipe for mordant (pt. 2: 24–25) is almost identical to that in **Bosse** (Paris 1645) [No. 42.2]: 11.

1 –

Line Engraving / Line Etching

2 –

Copper

5 –

Aesthetics / Art History

In: BL; *Blas Benito 1994*: 69; BLBS; BN (2×, 2nd copy inc.); BS ('Nicht mehr vorhanden'); CCB; DBI-VK; *Hind 1963-1*: 398; NCC; NSUG; NUC–1956; OCLC; RMA; TUD; UBG (missing); UBH; UBU; ULC.

181.2

Cabinet des singularitez d'architecture, peinture, sculpture et graveure. Ou introduction à la connoissance des plus beaux arts, figurés sous les tableaux, les statues & les estampes / par Florent le Comte ; Karrewijn fec. - Seconde éd. - Brusselles : chez Lambert Marchant, 1702. - 3 vol. : ill. ; 14.5–15 cm.

§ The text, which has been reset, is almost identical to the text in the first edition, but without the stocklist.

– Vol. 1: Tome premier / madrigal sur le sujet M.R. fec. - [24], XXXXIII, [1], 254 [= 354], [6] p. : front., 3 etch.

MIP: pp. 116–131.

Contents: p. [1] at the back.

§ Approbation, p. [3]: 'Donné à Versailles, le 9. Avril 1699.'

Privilege of the Spanish king, p. [4]: 'donné en notre Ville de Brusselles le 4. Novembre 1701. Paraphé Grysp. vt. Signé Loyens.'

§ The etchings show marks and monograms of engravers and are copied after the woodcuts in the first edition.

– Vol. 2: Tome second. - [6], 422, [10] p. : front., 1 etch.

Contents: p. [1] at the back.

– Vol. 3: Tome troisie'me. - [2], 496, [22] p. : front.

MIP: pp. 242–247.

Contents: p. [1] at the back.

1 –

Line Engraving / Line Etching

2 –

Copper

5 –

Aesthetics / Art History

In: BL; *Blas Benito 1994*: 69; BNM; BS ('Nicht mehr vorhanden'); CCB; DBI-VK; KB; NSUG; NUC–1956; OCLC; PBM; RMA; UBH; ULC.

181.3

Het konst-cabinet der bouw- schilder- beeldhouw- en graveerkunde, of inleiding tot de kennis dier fraaije weetenschappen, vervat in de schilderyen, stand-beelden en prenten / door Florentijn le Comte ; na het Fransch gevolgt ; fec. & scu. F[rans] de Bakker. - Utrecht : by Arnoldus Lobedanius, 1744–1745. - 2 vol. : pl. ; 20.5 cm.

§ Title means: The art-cabinet of architecture, painting, sculpture and engraving, or introduction to the knowledge of these fine sciences, contained in painting, statues and prints

After which of the two French editions this translation is made is unknown.

– Vol. 1: Het konst-cabinet der bouw- schilder- beeldhouw- en graveerkunde, of inleiding tot de kennis dier fraaije weetenschappen, vervat in de schilderyen, stand-beelden en prenten. Behelzende, behalven een beknopte leevensbeschryving der aloude schilders en beeldhouwers, ook die der latere Italiaanse, Franse, Hoogduitse en Nederlandse meesters, die zo wel in de schilder- en bouw-, als plaatsnykunde uitgemunt hebben, beneevens de catalogi hunner werken. Verrykt met een verhandeling over het glas-schilderen, een vertoog over het etzen, en wat tot het leeren en oeffenen dier kundigheid vereist word en andere weetenswaardige zaaken. I. deel. - 1745. - [22], 475, [3] p. : front., 3 pl.

MIP: pp. 105–119.
Contents: p. 469.
Addenda & corrigenda: p. [1] at the back.
§ The technical part is about engraving.
The etched frontispiece is dated '1744', the title page '1745'.
The plates show marks and monograms of engravers.
– Vol. 2: Het konst-cabinet der bouw- schilder- beeldhouw- en graveerkunde, of inleiding tot de kennis dier fraaye weetenschappen, vervat in de schilderyen, stand-beelden en prenten. Verrykt met een beknopte leevensbeschryving der voornaamste schilders, beeldhouwers en plaatsnyders. II. deel. - 1744. - 751 p. : front., 2 pl.
MIP: pp. 481–486.
Contents: p. 735.
Addenda & corrigenda: p. 751.
§ The art-cabinet of architecture, painting, sculpting and engraving, or introduction to the knowledge of those fine sciences, contained in the paintings, statues and prints. Enriched with a short biography of the most prominent painters, sculptors and engravers. II part.
The technical part is about etching.
The etched frontispiece is dated '1744', the title page '1745'.
The plates show marks and monograms of engravers.
In: BL; BLBS; CCB; DBI-VK; KB; NCC; NUC–1956; OCLC; PBF; PBM; Priv.Coll.; TUD; UBA; UBG; UBL-KHI (vol. 1); UBN; UBU.

181.4

Het konst-cabinet der bouw- schilder- beeldhouw- en graveerkunde, of inleiding tot de kennis dier fraaije weetenschappen, vervat in de schilderyen, stand-beelden en prenten / door Florentijn le Comte ; na het Fransch gevolgt ; fec. & scu. F[rans] de Bakker. - Tweeden druk. - Arnhem : by J.C. en G.M. Nebe, [c. 1750?]. - 2 vol. : pl. ; 20.5 cm
§ Probably a remainder of the edition 1744–1745, with a newly printed title page pasted in.
In: UBL-KHI (vol. 2).

181.5

Het konst-cabinet der bouw- schilder- beeldhouw- en graveerkunde, of inleiding tot de kennis dier fraaije weetenschappen, vervat in de schilderyen, stand-beelden en prenten / door Florentijn le Comte ; na het Fransch gevolgt ; fec. & sculp. F[rans] de Bakker. - Dordrecht : Abraham Blussé, 1761. - 2 vol. : ill. ; 21 cm.
§ The frontispieces of both volumes are still dated '1744'.
– Vol. 1: I. deel. Het konst-cabinet der bouw- schilder- beeldhouw-en graveerkunde, of inleiding tot de kennis dier fraaije weetenschappen, vervat in de schilderyen, stand-beelden en prenten. Behelzende, behalven een beknopte leevensbeschryving der aloude schilders en beeldhouwers, ook die der latere Italiaansche, Fransche, Hoogduitsche en Nederlandsche meesters, die zo wel in de schilder- en bouw-, als plaatsnykunde uitgemunt hebben, benevens de catalogi hunner werken. Verrykt met een verhandeling over het glas-schilderen, een vertoog over het etzen, en wat tot het leeren en oeffenen dier kundigheid vereischt word en andere weetenswaardige zaaken. - [18], 328, [8] p. : front., 3 engr.
List of subscribers: p. [11] at the beginning.
MIP: pp. 75–86.
Index: p. [1] at the back.
– Vol. 2: Het konst-cabinet der bouw- schilder- beeldhouw- en graveerkunde, of inleiding tot de kennis dier fraaije weetenschappen, vervat in de schilderyen, stand-beelden en prenten. Behelzende, behalven een beknopte leevensbeschryving der aloude schilders en beeldhouwers, ook die der latere Italiaansche, Fransche, Hoogduitsche en Nederlandsche meesters, die zo wel in de schilder- en bouw-, als plaatsnykunde uitgemunt hebben, benevens de catalogi hunner werken. Verrykt met een verhandeling over het glas-schilderen, een vertoog over het etzen, en wat tot het leeren en oeffenen dier kundigheid vereischt word, en andere weetenswaardige zaaken. II. deel. - 506, [8] p. : front., 2 engr.
MIP: pp. 333–336.
Index: pp. [1] at the back.
In: CCB; KB; KUB; NCC; NUC–1956; OCLC; PBM; Priv.Coll.; UBA (2×); UBU.

181.6

Cabinet des singularitez d'architecture, peinture, sculpture et graveure. Ou introduction à la connoissance des plus beaux arts figurés sous les tableaux, les statues & les estampes / Florent le Comte. - [Photom. repr.]. - Genève : Minkoff, 1972. - 3 vol. (414 p.) : ill. ; […] cm.
§ Photomechanical reprint of: Paris 1699–1700.
NOT SEEN
In: BS; DBI-VK; OCLC; ULC.

Le Prince (Jean Baptiste) 182.1

Gravure au lavis / Jean Baptiste Le Prince. - [Paris?], [c. 1770?].
§ Title means: Engraving in lavis
Manuscript.
Language: French.
Contains instructions for Le Prince's aquatint manner. Note that the term *lavis* that he uses for his dust-grain process, reflects the washed drawings it copies.
Le Prince died in 1781 and his niece inherited the manuscript. This was bought by the Académie Francaise in 1782 which disseminated copies of the text.
Title description after the edition: Paris 1791 [No. 182.3].
See also: **Le Prince 1** (1769) [No. 506]; **Le Prince 2** (1771) [No. 507]; **Le Prince 3** (1780) [No. 508].
1 –
Aquatint
NOT SEEN
In: present whereabouts or original or copies unknown.

182.2

Prospectus de la souscription tentée par Le Prince pour la vente de son procédé / [Jean Baptiste] Le Prince, [?] Lesacher et [?] Carault. - Paris : [Le Prince?], 10 july 1780.

§ Title means: Prospectus for the subscription tried by Le Prince for the sale of his process

Title of the *annexe*: Découverte d'un procédé de gravure en lavis par M. Le Prince, peintre du Roi en conseiller de Son Académie Royale de peinture et sculpture, proposé par souscription

Title of the annex means: Disclosure of a tonal engraving process by Mr Le Prince, painter to the King and councillor of His Royal Academy for painting and sculpture, proposed by subscription.

This is the prospectus for a series of 30–40 new prints in aquatint by Le Prince. The series would include a treatise about his technique with a print showing the different techniques. The project was abandoned when Le Prince died in 1781 and his niece inherited the manuscript [No. 182.1]. This was bought by the Académie Francaise in 1782 which disseminated copies of the text. The instructions were published in the *Encyclopédie méthodique. Beaux arts* (Paris 1791), see: Paris 1782–1830 [No. 182.3].

Announcement: J.G. Meusel (ed.), in *Miscellaneen artistischen Inhalts*, 9 (1781): 180–182.

In: *Blas Benito 1994*: 69; *Hédou 1879*: 189–195 (integral text of the prospectus); *Singer & Strang 1897*: no. 64.

182.3

Encyclopédie methodique, ou par ordre de matières / par une société de gens des lettres, de savans et d'artistes ; premiers éditeurs [Denis] Diderot et [Jean Lerond] d'Alembert. - Paris [etc.] : chez Pancoucke [etc.], 1782–1830. - 198 vol. : ill.
– Vol.: Beaux arts : text. - Paris: chez Pancoucke ; Liège : Monteux, 1788–1791. - 2 vol. : pl. ; 27–30 cm.
MIP: Gravure au lavis, inventée par [Jean Baptiste] Le Prince. - Vol. 2, pt. 2 (1791). - P. 622–625.
§ Publication based on the manuscript [No. 182.1], p. 623: 'On va transcrire ici le secret de son procédé, tel qu'il l'a remis luI–meme à l'Académie.'
Le Prince died in 1781 and his text was published posthumously.
Transcription: Paris 1879 [No. 182.4].
Modern German translation of Le Prince's text: Coburg 2007.
1 –
Aquatint / Lift-ground / Line Etching
2 –
Copper
In: BLBS; CCB; HAB; KB; NCC; NUC–1956; PBL (inc.); PBM; TM; TUD; UBA (inc.); UBL; UBM; UBN (inc.).

182.4

Jean Le Prince et son oeuvre / J[ules Paul Ernest] Hédou. - Paris : Rapilly, 1879. - 330 p. : front., vign. ; 24–25 cm.
MIP: pp. 179–195.
Chronological table of works by Le Prince; p. 317.
Alphabetical table of works by Le Prince: p. 321.
Contents: p. 330.
Edition: 350 copies.
§ Contains a transcription of the text of the treatise in the 'Encyclopédie methodique' [No. 182.3].
Fifty copies of the edition were printed on Whatman paper and 300 on Dutch paper.
Announcement: *American Art Review*, 6 (1880): 267.
Photomechanical reprint: Amsterdam 1970 [No. 182.5].
In: BL; *Blas Benito 1994*: 69; BLBS; BN; CCB; DBI-VK; NCC; OCLC; RMA; UBL-KHI; UBU-KHI.

182.5

Jean-Baptiste Le Prince, 1734–1781 peintre et graveur : étude biographique et catalogue raisonné de son oeuvre gravé suivi de nombreux documents enédits avec une table alphabétique, chronologique et générale / Jules [Paul Ernest] Hédou. - Réimpression. - Amsterdam : Hissink, 1970. - [6], 330, [6] p. : front., vign. ; 23 cm. - (Scripta artis monographia ; 6).
MIP: pp. 179–195.
Chronological table of works by Le Prince; p. 317.
Alphabetical table of works by Le Prince: p. 321.
Contents: p. 330.
Stocklist: p. [1], at the back.
ISBN 90-6025-106-7
§ Photomechanical reprint of: Paris 1879 [No. 182.4].
In: BNM; DBI-VK; NCC; OCLC; UBH; UBU.

182.6

Aquatint, oder 'Die Kunst mit dem Pinsel in Kupfer zu stechen. Das druckgraphische Verfahren von seinen Anfängen bis zu Goya / Christiane Wiebel ; unter Mitarbeit von Wolfgang Schwahn. - Coburg : Kunstsammlungen der Vest Coburg ; München : Deutscher Kunstverlag, 2007. - 359 p. : 233 Abb. ; 28.5 cm.
Contents: p. 5.
MIP: Das Verfahren der 'Gravure au lavis' von Jean-Baptiste Le Prince / übers. von Christiane Wiebel ; mit Hilfe von Silvia Böcking und Wolfgang Schwahn. - P. 333–336.
Literature: p. 340.
Index: p. 354.
ISBN 978-3-422-06693-9 (hardcover)
§ Contains a modern German translation of the text of the treatise in the 'Encyclopédie methodique', Paris 1788–1791 [No. 182.3].
Review: A. Grifftiths, 'Aquatint', in *Print Quarterly*, 25 (2008) 3: 331–332.
In: HAB; KVK; RMA.

Leaf (Ruth) 183.1

Intaglio printmaking techniques / Ruth Leaf ; [photogr. Robert Schiavo, Daniel Quat] ; [ill. Joyce Hurwitz, Sharen Hedges]. - New York : Watson-Guptill, 1976. - 232 p. : [236] ill., of which [16] in colour ; 31 cm.
Contents: p. 7.
Glossary: p. 223.
Suppliers: p. 227.
Literature: p. 229.

Index: p. 230.
ISBN 0-8230-2554-3 (hardcover)
§ The illustrations are diagrams, photographs and reproductions. The illustrations are numbered by chapter, the reproductions are not numbered.
Photomechanical reprint: New York 1984 [No. 183.2].
1 –
Aquatint / Collagraph / Drypoint / Lift-ground / Line Engraving / Soft-ground
2 –
Copper / Plastic / Steel / Zinc
3 –
Blind Embossment / Counterproof / Ink / Multiple-plate Printing / Paper / Press / Printing in Black / Printing Polychrome / Relief Printing / Screen Printing / Viscosity Colour Printing
4 –
Troubleshooting
In: *Blas Benito 1994*: 82; NCC; OBA; OCLC; Priv.Coll. (2×).

183.2

Etching, engraving and other intaglio printmaking techniques / Ruth Leaf ; [photogr. Robert Schiavo and Daniel Quat] ; [ill. Joyce Hurwitz Sharen Hedges]. - Republication. - New York : Dover, first published 1984. - 232, [7] p. : [236] ill., of which [4] in colour ; 28.5 cm.
Contents: p. 7.
Glossary: p. 223.
Suppliers: p. 227.
Literature: p. 229.
Index: p. 230.
Stocklist: p. [3].
ISBN 0-486-24721-X (softcover)
§ P. 4: 'In the present edition the 16 original color illustrations are reproduced in black and white in the text (five [sic! = 4] being reproduced in color on the [inside] covers), and the section "Supplies and Suppliers" has been updated.'
Photomechanical reprint of: New York 1976 [No. 183.1].
In: *Blas Benito 1994*: 82; BIP+; *Figueras Ferrer 1992*: 1054; NCC; OBA; OCLC; Priv.Coll. (2×).

Lebourg-Rigal (Nicole) 184.1

Cours de gravure / Nicole Lebourg ; préf. de Jean Grosjean. - Paris : De Vecchi, 1997. - 159 p : ill. ; 24 cm.
Literature: p. 156
2–7328–6008–5 (softcover)
1 –
Drypoint / Line Engraving / Line Etching / Soft-ground
2 –
Copper
3 –
Printing Polychrome
4 –
Art History / Woodcut / Wood Engraving
NOT SEEN
In: KVK.

184.2

Cours de gravure / de Nicole Lebourg-Rigal. - Nouv. éd. - Paris : De Vecchi, 2003. - 159 p. : ill. ; 24 cm.
ISBN 2-7328-6066-2 (softcover)
ISBN 978-2-7328-6066-4 (softcover)
NOT SEEN
In: KVK.

184.3

Curso de grabado / Nicole Lebourg ; prólogo de Jean Grosjean ; [traducido del francés de Ariadna Martín Sirarols]. - Barcelona : De Vecchi, [1999]. - 156 p. : ill.; 24 cm.
NOT SEEN
In: BNM.

Lehrs (Max)
See: **Stauffer-Bern** (Karl) [No. 320].

Lehtinen (Tuula) 185.1

Metalligrafiikka / Tuula Lehtinen ; julkaisutyöryhmä Pentti Kaskipuro, Matti Koskela, Elina Luukanen, Raija Partanen ; teoskuvat Tuulikki Holopainen, Martti Kapanen, Timo Lehtinen, Soili Rasl–Bäckman, Borahan Topcu. - [1st ed.]. - Helsinki : Taide ; Jyväskylä : Luova Grafiikka, 1992. - 200 p. : [137] ill., of which [26] in colour ; 25.5 cm.
Contents: p. 5.
Polyglot: p. 180.
Subject index: p. 193.
Index on artists: p. 199.
Literature: p. 200.
ISBN 951-608-003-0
§ Title means: Printmaking from metal plates, or, Intaglio printmaking
Preface dated, p. 8: 'Tampere 7.9.1991, Tuula Lehtinen'.
Title description after the second edition, which is identical to the first edition, and from information by Taide Art Publishers.

NOT SEEN
In: HELKA (5×).

Metalligrafiikka / Tuula Lehtinen ; julkaisutyöryhmä Pentti Kaskipuro, Matti Koskela, Elina Luukanen, Raija Partanen ; teoskuvat Tuulikki Holopainen, Martti Kapanen, Timo Lehtinen, Soili Rasl–Bäckman, Borahan Topcu. - [2nd ed.]. - Helsinki : Taide ; Jyväskylä: Luova Grafiikka, 1997. - 200 p. : [137] ill., of which [26] in colour ; 25.5 cm.
Contents: p. 5.
Polyglot: p. 180.
Subject index: p. 193.
Index on artists: p. 199.
Literature: p. 200.
ISBN 951-608-003-0 (hardcover)
1 –
Aquatint / Carborundum Print / Collagraph / Crayon Engraving / Drypoint / Lift-ground / Line Engraving/ Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Aluminium / Copper / Iron / Photopolymer Film / Zinc
3 –
Blind Embossment / Chine Collé / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Viscosity Colour Printing
4 –
Monotype
5 –
Art History / Conservation and Restoration
In: Priv.Coll.

Leprince (Jean Baptiste)
See: **Le Prince** (Jean Baptiste) [No. 180].
See: **Le Prince 1** (Jean Baptiste) [No. 506].
See: **Le Prince 2** (Jean Baptiste) [No. 507].
See: **Le Prince 3** (Jean Baptiste) [No. 508].

Leurent (Maurice Rousseau)
See: **Rousseau-Leurent** (Maurice) [No. 276].

Kunst- und Werck-Schule / von einem sonderbaren Liebhaber natürlicher Künste und Wissenschafften. - Nürnberg : in Verlegung Johann Ziegers, 1696. - 2 vol. : front. ; [c. 18 cm?]
§ Title means: Art and work school
Title on frontispiece: Der Curieusen Kunst und Werck-Schuel erster und anderer Theil
Typical recipe book containing hundreds of prescriptions for all kinds of art and craft processes, which in their turn can be found in other recipe collections.
Title description after prints from microfilm.
– Vol. 1: Der Curieusen Kunst- und Werck-Schul, erster Theil, lehrend allerhand sehr nützliche und bewährte Feuer-Künste, metallische Gold- und Silber-Proben, Perlen, Flüsse, Doubleten und Folien, der Natur ähnlich; ungleichen auch allerley Bilder und Figuren abzuformen, in Glaß und künstlichen Flüssen abzugiesen, auch allerley Glaßzur Mahlerey, Porcellan- und Töpffer-Arbeit zu machen, metallene Spiegel zu giesen, zu poliren, Eisen und Stahl zu härten und zu etzen; sampt vielen andern Natur- und Kunst-Geheimnussen / theils aus eigener langwieriger Erfahrung, theils aus vielen bewährten Authoribus getreulich, mühsam und aufrichtig zusammen getragen von einem sonderbaren Liebhaber der narürlichen Künste und Wissenschafften. - [8], 723, [56] p.
Contents: p. [1] at the back.
– Vol. 2: Kunst- und Werck-Schule, anderer Theil, darinnen zu erlernen allerhand schöne bewährte Lac- Spick- Terpentin- und Oel-Fürnisse, ungemeine bunte schöne Holtz-Arbeiten, allerhand Farben, Holtz-Beitzungen, fürtrefflich- erdencklichen Verguldung- und Versilberungen auf allerley Dinge, Holtz und andere Dinge in Formen zu giesen, schönen Helffen- und andern Bein- und Horn-Arbeiten, allerley erdenckliche Kütten und Leimen zu vielerley Sachen. Item, von schönen Corallen-Arbeiten, das Türckische Papier auf unterschiedliche Arten, sampt andern curiösen Papier-Künsten, und Bildereyen, von der Radir- und Zeichen-Kunst, allerhand schöne Marmor-Künste und Arbeiten, das Gips- und Hausenblasen-Giesen, von schöner und bunter Leinwad, Taffet- Tuch- und Leder-Wischung, das Pergament von allerley Farben schön durchsichtig zu bereiten, und endlich von allerley Farben schön und wolriechend Siegel-Lack zu machen / alles durch langwierige Erfahrung, auch aus bewährten Authoribus mit groser Mühe, Fleiß und Unkosten zusammen verfasset, und aus Liebe mitgetheilet von einern sonderbaren Liebhaber natürlicher Künste und Wissenschafften. - 657, [73] p.
MIP: pp. 76, 516–540, 575–577.
Index: p. [1].
§ Date of printing, p. [75]: 'Nürnberg : gedruckt bey Christian Sigmund Froberg, 1696'.
1 –
Line Etching
2 –
Copper
3 –
Casting / Counterproof / Ink / Printing in Black
4 –
Drawing / Painting / Sculpture

Der zu vielen Wissenschafften dienstlich-anweisende curiöse Künstler / von einem sonderbaren Liebhaber natürlicher Künste und Wissenschafften. - Nürnberg: verlegts Johann Leonhard Buggel, 1703–1705. - 2 vol. : ill. ; […] cm.
§ Title means: The special artist pointing to many sciences (etc.)
Typical recipe book containing hundreds of prescriptions for all kinds of art and craft processes, which in their turn can be found in other recipe collections.
– Vol. 1: Der zu vielen Wissenschafften dienstlich-anweisende curiöse Künstler, vorgestellt in einem neu verfertigten und in zwey Theile eingerichteten Kunst- Haus- und Wunderbuch; in dessen ersten Theil abgehandelt wird: I. Die Erkänntnis der gerechten und guten Edelgesteine, deren Preiß und Tugenden, derselben Exaltation an ihren Kräfften und Schönheit, ingleichen von Perlen, Corallen, und endlich auch von denen durch Kunst gemachten Flüssen und Steinen. II. Die edle Probier-Kunst auf allerley Mineralien, Metallen und Müntzen, nebenst angefügten ungemeinen sowol chymischen als andern Wissenschafften in allen ersinnlichen metallischen Künsten und Arbeiten, wie selbige auch seyn mögen, wozu noch kommt ein Bericht vom Glaß machen und Töpffer-Glasuren etc. III. Das künstliche Stuckgiessen, und was bey solcher Kunst höchstnöthig zu wissen, dabey zugleich viel vom Salpeter-Sieden, Pulver machen, auch andere für Constabler und Feuer-Wercker dienende rare Wissenschafften und Secreten zu finden. IV. Unterschiedliche in Verwunderung bringende wunderbare Künste, seltsame Würckungen der Natur, nebst sehr vielen und nutzlichen Curiositäten. V. Allerhand schöne nicht überall zu findende Mahler- Bildhauer- Kupfferstecher- und Schreiner-Künste, begleitet durch eine Anweisung rare Fürnisse zu machen etc. VI. Die edle Schreib-Kunst, mit vielen, zu derselbigen Nothwendigkeit, als Zier, gehörigen Wissenschafften. In dem andern Theil werden angewiesen: I. Die Distillir-Kunst, von guten fürtrefflichen, zur Gesundheit des Menschen dienenden Wassern, wolriechenden Dingen, fürtreffliche Medicamenta, und sehr rare chyrurgische Secreta. II. Allerley seltsame Garten- und Pflanz-Künste, versehen mit einem vermuthlichem Prognostico des Gewitters, und vielen Mitteln zur Vertreibung alles Ungeziefers aus den Gärten und Häusern etc. III. Unterschiedliche Wein- Meth- Bier- Brandwein- und Essigkünste, nebenst Zubereitung seltener Geträncke. IV. Sehr viel bewährte Artzneyen für die Rosse, und anders Haus-Vieh, nebst nicht wenigen verborgenen Jäger-Kunst-Stücken, auch grossen Geheimnissen von allerley Geflügel-Werck, Fischen und Krebsen etc. V. Allerhand fürtreffliche erdenckliche Leder-Arbeit, die künstliche Schön-Färberey, auf Tuch, Wüllen, Garn, Seiden etc. geheime Kürschner- und denn endlich allerley nützliche, ungemeine Haushaltungs-Künste. Ein Werck so jedermänniglich, wes Standes, Profession, oder Geschlechts er immer seyn mag, nutzlich und dienlich zu lesen: mit grosser langwieriger Mühe und Fleiß zusammen getragen und mit hierzu dienlichen Kupfern versehen, ans Lich gegeben / von einem sonderbaren Liebhaber natürlicher Künste und Wissenschafften. - Nürnberg : verlegts Johann Leonhard Buggel, 1703. - [36], 772, [52] p. : front.
MIP: pp. 147, 337–339.
Index: p. [1] at the back.
§ Title description after a microfiche of the *Fünftes Buch*.
– Vol. 2: Der zu vielen Wissenschafften dienstlich-anweisende curiöse Künstler, aufgeführt in einem neu-verfertigten, und, nach folgenden Sätzen, eingerichteten Haus-Arzeney- und Kunst-Buch … [etc.] / von einem sonderbaren Liebhaber natürlicher Künste und Wissenschafften. - Nürnberg: verlegts Johann Leonhard Buggel, 1705. - [8], 954, [44] p.
1 –
Line Etching
2 –
Copper
3 –
Counterproof / Print behind Glass
4 –
Painting / Sculpture
In: BS; KVK.

La gravure originale en couleurs / René Ligeron ; préface de H[enri] Le Riche ; suivi d'un appendice concernant l'impression par Ch[arles] Leblanc. - [1st ed.]. - Paris : Lefranc, 1923. - V, 173 p. : 3 ill. ; 24 cm. + 5 etch., of which [1] in colour ; 24 cm
§ Title means: Original engraving in colours
NOT SEEN
In: BL; BN; MET; OCLC.

La gravure originale en couleurs / René Ligeron ; préface de H[enri] le Riche ; suivi d'un apendice concernant l'impression par Ch[arles] Leblanc. - Deuxième éd. rev. et cor. - Paris : Lefranc, 1924. - VI, 173 p. : 52 ill., 3 reprod. ; 24 cm + 5 etch., of which [1] in colour ; 23.5 cm.
Contents: p. 169.
List of illustrations: p. 171.
List of etchings: p. 172.
§ The first hundred copies of this edition are printed on 'papier de luxe' and numbered '1'-'100', while the five etchings are printed on Japanese paper from the Imperial Paper Manufactury. For the trade edition the etchings are printed on 'Vélin d'Arches'.
The illustrations are wood engravings.
The tools depicted show the name of the publisher Lefranc, dealers in artists' materials.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Copper / Steelfacing
3 –
Ink / Paper / Press / Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Monotype
5 –
Art History

In: BLBS; KBR; NUC–1956; OCLC; Priv.Coll.

Original engraving in colours / René Ligeron ; foreword by H[enri] le Riche ; appendix on printing by Charles Leblanc; transl. from the French by Frank L. Emanuel. - Third ed. rev. and corr. - Paris : Lefranc, 1931. - [4], IV, 165 p. : 52 ill., 3 reprod. + 5 etch., of which [1] in colour ; 24.5 cm.
Conversion table for French and English weights and measures: p. [4].
Contents: p. 161.
List of illustrations: p. 163.
List of etchings: p. 165.
In: *Bridson & Wakeman 1984*: no. B87; NUC–1956; OCLC; Priv.Coll.

Lilien (Otto M.)
See: **Le Blon** (Jacque Christoph) [No. 180.7].

Longhi (Giuseppe)   189.1

La calcografia propriamente detta ossia l'arte d'incidere in rame coll'acqua-forte, col bulino e colla punta. Ragionamenti letti nelle adunanze dell'I.R. Istituto di Scienze, lettere ed arti del regno Lombardo-Veneto. Volume I. Concernente la teorica dell'arte / da Giuseppe Longhi ; notizie biografiche de G[iuseppe] L[onghi] raccolte du F. Longhena ; Pietro Anderloni, Giuseppe Longhi sculp. - Milano : Stamperia Reale, 1830 [= 1831]. - XXXII, 436, [1] p. : engr. titlep., [2] pl. ; 22.5 cm.
Contents: p. III.
Biography of Longhi: p. 395.
Addenda & corrigenda: p. [1].
With literature.
§ Title means: The chalcography properly so named or rather the art of engraving in copper with strong water, with the burin and with the point. Short discussions in the assembly of the Royal Institute of Science, letters and arts of the kingdom of Lombardy and Veneto. Volume I. Concerning the theory of art
The title page gives '1830' as the year of publication, while the biography of Longhi gives (p. 427) as the date of his death '2 January 1831'. Johann Wolfgang Goethe referred to this book in August, September and October 1831; *Goethe 1985*, 38: 474, no. 861; *Goethe 1987*, 142 (1987): 46, 58, 70, 76, 93, 95–96; *Goethe 1978–1999*, 18.2: 321; *Vontin 1938*: 111.
Does not contain instructions for intaglio printmaking. Longhi – an engraver by profession – intended to add a practical part (p. 281 n., p. 297 n.), but he died before he could carry out his plan. Carl Barth, translator of the German edition, took care of this instead, see the following edition.
5 –
Art History / Original and Reproduction
In: BL; *Blas Benito 1994*: 69; BS; CCB; DBI-VK; *Figueras Ferrer 1992*: 1055; *Hind 1963-1*: 399; NSUG; NUC–1956; OCLC; ÖNB; RMA.

189.2

Die Kupferstecherei oder die Kunst in Kupfer zu stechen und zu äzen / von J[oseph] Longhi. - Hildburghausen ; Meiningen : im Verlag der Kesselring'schen Hofbuchhandlung, 1837. - 2 vol. in 1 bd. : ill. ; 17.5–18.5 cm.
With literature.
§ The dedication to Therese von Thurn und Taxis is dated, p. [6]: 'Hildburghausen, den 5. Jan. 1837'. The preface is dated, p. [8]: 'Hildburghausen, im Jan. 1837'.
Intended audience, vol. 1, p. [7]: 'allen Kunstliebenden und Kennern im allgemeinen, und allen Kunstjüngern'.
– Vol. 1: I. theoretischer Theil / von J[oseph] Longhi ; aus dem Italiänischen übersetzt von C[arl] Barth. - [8], 368 p.
§ Translation of the edition: Milano 1830 (= 1831) [No. 189.1].
Comments by Barth: vol. 2, pp. 178–187.
– Vol. 2: II. praktischer Theil / von C[arl] Barth. - VI, [2], 187, [5] p. : [1] ill., II Taf.
Addenda & corrigenda (second part) to vol. 1: p. [1] at the beginning.
Addenda & corrigenda to vol. 2: p. [2] at the beginning.
Supplier of ruling machines: p. 16.
Contents vol. 1: p. [1] at the back.
Contents vol. 2: p. [2] at the back.
Addenda & corrigenda (first part) to vol. 1: p. [5] at the back.
Specimens: *Tafel* I & II.
§ The preface is dated, p. VI: 'Hildburghausen, im Juli 1837'.
The *Tafel* are etchings. *Tafel I* is etched on copper and *Tafel II* on steel, see p. [3] at the back. Both show tools and specimens of hatchings.
Barth intends (p. V) this technical part for young men who want to study engraving and etching, for which no suitable manual is available. Professional engravers might find something new in between.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Line Engraving / Line Etching / Mezzotint / Ruling Machine
2 –
Copper / Steel
3 –
Casting / Paper / Press / Printing in Black
5 –
Aesthetics / Art History / Health and Safety
In: ABK; *Börsenverein 1885*; BS; DBI-VK; GLVA; HAB; *Hind 1963-1*: 399; NSUG; NUC–1956; OCLC; ÖNB; Priv.Coll.; *Singer & Strang 1897*: no. 149; UBAB; UBH.

Longley (Dianne)   190.1

Printmaking with photopolymer plates : a new, safe, versatile printmaking technique for artists and students / Dianne Longley ; photogr. Michal Kluvanek … [et al.] ; ill. Trevor Murch-Lempinen. - Adelaide : Illumination Press, 1998. - 112 p. : ill. ; 23.5 cm.
Advertisement: p. 2.

Contents: p. 6.
Glossary: p. 100.
Literature: p. 103.
Suppliers: p. 104.
Index: p. 110.
ISBN 0-646-27392-2 (softcover)
§ Announcement: D. Longley, P. Muir, 'Solarplate printmaking', in *Printmaking Today*, 5 (1996), 4: 31–32.
Review: S. Hoskins, 'Photopolymer Plates the Future?', in *Printmaking Today*, 7 (1998) 4: 16.
2 –
Photopolymer Plate
3 –
Printing in Black / Relief Printing
4 –
Troubleshooting
5 –
Art History
In: Priv.Coll.

<div align="right">190.2</div>

Printmaking with photopolymer plates : a new, safe, versatile printmaking technique for artists and students / Dianne Longley ; photogr. Michal Kluvanek … [et al.] ; ill. Trevor Murch-Lempinen. - [2nd ed.]. - Adelaide : Illumination Press, 2003. - 112 p. : ill. ; 23.5 cm.
ISBN 0-646-27392-2 (softcover)
ISBN 978-0-646-27392-1 (softcover)
NOT SEEN
In: KVK.

<div align="right">**Lumsden** (Ernest Siegfried)   191.1</div>

The art of etching : a complete & fully illustrated description of etching, drypoint, soft-ground etching, aquatint & their allied arts, together with technical notes upon their own work by many of the leading etchers of the present time / by E[rnest] S[iegfried] Lumsden. - [1st ed.]. - London : Seeley, Service, 1925. - 376, [16] p. : front., 152 pl., 55 fig. ; 20.5 cm. - (The new art library).
Titles in the series: p. 2.
Contents: p. 10.
List of plates: p. 11.
List of figures: p. 15.
Index: p. 369.
Advertisement: pp. [1]–[2], [7]–[8].
Stocklist: pp. [3]–[6], [8]–[16].
§ The preface is dated, p. 9: 'Edinburgh, August 1924'.
Text, plates and figures are identical in all editions.
Chapter XXVIII (pp. 325–367) reproduces 55 etchings by 14 artists with their personal comments on the materials and techniques used by them.
Probably issued together with: Philadelphia 1925 [No. 191.3].
1 –
Aquatint / Drypoint / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Aluminium / Copper / Steel / Steelfacing / Tin / Zinc
3 –
Casting / Counterproof / Ink / Paper / Press / Printing Monochrome / Printing in Black
5 –
Aesthetics / Art History / Conservation and Restoration
In: BL; *Blas Benito 1994*: 83; BLBS; CCB; CCB (2×); KB; MBvB; NUC–1956; OCLC; Priv.Coll. (2×); RAL; RMA; UBL-KHI.

<div align="right">191.2</div>

The art of etching : a complete & fully illustrated description of etching, drypoint, soft-ground etching, aquatint & their allied arts, together with technical notes upon their own work by many of the leading etchers of the present time / by E[rnest] S[iegfried] Lumsden. - [1st ed.]. - London : Seeley, Service, 1925. - 376 p. : front., 152 pl., 55 fig., 3 etch. : 21 cm.
Titles in the series: p. 2.
Contents: p. 10.
List of plates: p. 11.
List of figures: p. 15.
Index: p. 369.
Edition: 150 copies of which 145 were for the trade.
§ Deluxe edition with four etchings by the author: the frontispiece, and the originals of plates 7, 16 and 18.
In: BL; Priv.Coll. (no. 17).

<div align="right">191.3</div>

The art of etching : a complete & fully illustrated description of etching, drypoint, soft-ground etching, aquatint & their allied arts, together with technical notes upon their own work by many of the leading etchers of the present time / by E[rnest] S[iegfried] Lumsden. - [1st ed.]. - Philadelphia : Lippincot, [1925?]. - 376, [16] p. : front., 152 pl., 55 fig. ; 20.5 cm. - (The new art library).
Titles in the series: p. 2.
Contents: p. 10.
List of plates: p. 11.
List of figures: p. 15.
Index: p. 369.

Advertisement: p. [1]–[2], [7]–[8].
Stocklist: pp. [3]–[6], [8]–[16].
Edition: 150 copies of which 145 were for the trade.
§ Undated, but probably issued together with: London 1925 [No. 191.1].
NOT SEEN
In: NUC–1956; OCLC (34×); ULC.

<div align="right">191.4</div>

The art of etching : a complete & fully illustrated description of etching, drypoint, soft-ground etching, aquatint & their allied arts, together with technical notes upon their own work by many of the leading etchers of the present time / by E[rnest] S[iegfried] Lumsden. - [2nd ed.] - London : Seeley, Service, 1929. - 376, [6] p. : front., 152 pl., 55 fig. ; 20.5 cm. - (The new art library).
Titles in the series: p. 2.
Contents: p. 10.
List of plates: p. 11.
List of figures: p. 15.
Index: p. 369.
Titles in the series: p. [1] at the back.
In: NUC–1956; Priv.Coll. (2×); UBH; UBU.

<div align="right">191.5</div>

The art of etching : a complete & fully illustrated description of etching, drypoint, soft-ground etching, aquatint & their allied arts, together with technical notes upon their own work by many of the leading etchers of the present time / by E[rnest] S[iegfried] Lumsden. - [2nd ed.]. - Philadelphia : Lippincot, 1929.
NOT SEEN
In: LC; NUC–1956; OCLC.

<div align="right">191.6</div>

The art of etching : a complete & fully illustrated description of etching, drypoint, soft-ground etching, aquatint & their allied arts, together with technical notes upon their own work by many of the leading etchers of the present time / by E[rnest] S[iegfried] Lumsden. - Unaltered republication. - New York : Dover, first published 1962. - [5] p., p. 8–376, [10] p. : front., 152 pl., 55 fig. ; 20.5 cm. - (The new art library).
Titles in the series: p. 2.
Contents: p. 10.
List of plates: p. 11.
List of figures: p. 15.
Index: p. 369.
Advertisement: pp. [1]–[2], [7]–[8].
Stocklist: inside front- and backcovers, p. [2] at the back.
SBN 486-20049-3 (softcover)
ISBN 0-486-20049-3 (softcover)
§ Photomechanical reprint of: London 1925 [No. 191.1].
For the hardcover school edition see: Magnolia 1990 [No. 191.7].
The SBN is given on p. [4], the ISBN is on the back of the cover and of later date because Dover publications are reprinted without any changes.
In: BIP+; *Blas Benito 1994*: 83; CCB; DBI-VK; *Figueras Ferrer 1992*: 1056; GBR; MMW; NCC; OCLC; Priv.Coll. (2×); RCE; RKD; TUE; UBR.

<div align="right">191.7</div>

The art of etching : a complete & fully illustrated description of etching, drypoint, soft-ground etching, aquatint & their allied arts, together with technical notes upon their own work by many of the leading etchers of the present time / by E[rnest] S[iegfried] Lumsden. - Unaltered republication. - Magnolia, Mass. : Peter Smith, [c. 1990?]. - [5] p., p. 8–376, [10] p. : front., 152 pl., 55 fig. ; 20.5 cm.
Contents: p. 10.
List of plates: p. 11.
List of figures: p. 15.
Index: p. 369.
ISBN 0-8446-2497-7 (hardcover)
§ Photomechanical reprint of: London 1925 [No. 191.1].
Hardcover school issue of: New York 1962 [No. 191.6].
NOT SEEN
In: BIP+; OCLC.

<div align="right">**Luttrell 1** (Edward)　192.1</div>

[Notes on mezzotint] / Edward Luttrell. - [London], [1683]. - [3] p. ; [2] diagrams ; […] cm.
§ Manuscript.
Language: English.
Contains concise instructions for making a mezzotint.
Edward Luttrell trained as a lawyer, but changed to the fine arts and made twenty mezzotints. He might have been related to Dorothy Wynne (née Luttrell), and perhaps a connection can be made with a manuscript with notes on etching from papers from the later Middleton family, see: **Notes 1** (London 1650–1700) [No. 221].
Title description after transcription, see: 1990 [No. 192.2].
1 –
Mezzotint
2 –
Copper
NOT SEEN
In: YU-YCBA.

Early mezzotint publishing in England-II: Peter Lely, Tompson and Browne / Antony Griffiths.
In: Print quarterly. - Vol. 7 (1990), no. 2 (June). - P. 130–145 : fig. 72–79.
MIP: Edward Luttrell's treatise of 1683. - P. 145.
In: HAB; KB; UBA.

Luttrell 2 (Edward)   193

[Notes on etching] / [Edward Luttrell?]. - [London?], [1650–1700?].
§ Manuscript.
Language: English.
British Library: 'The Middleton papers … were acquired from the descendants of Dr Owen Wynne … (d. 1700), whose wife was Dorothy, sister of Narcissus Luttrell.' These folia form part of the Middleton papers and there may be a connection with the engraver and painter Edward Luttrell, see:
Luttrell 1 (London 1683) [No. 192].
Title description after British Library ms. catalogue.
1 –
Line Etching
NOT SEEN
In: BL, Ms. Add. 41845, ff. 83–85v.

Lutz (Edwin George)   194

Practical engraving and etching. A book of instruction in the art of making linoleum blocks, wood-engraving, woodcuts made on the plank, etchings and aquatints / by E[dwin] G[eorge] Lutz. - New York ; London : Scribner's Sons, 1933. - VIII, 248 p. : [76] ill. ; 19.5 cm.
Other publications by the author: p. II, backside cover.
Contents: p. VII.
MIP: pp. 87–248 : [40] ill.
With literature.
§ Title on cover: Practical engraving and etching. Linoleum-block cutting, wood-engraving, sharpening tools, etching in line, printing etchings, soft ground and other methods in etching, aquatint and many helpful hints for carrying on etching processes
The illustrations are diagrams and reproductions.
1 –
Aquatint / Drypoint / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steelfacing / Zinc
3 –
Chine Collé / Press / Printing in Black
4 –
Linocut / Monotype / Photography / Woodcut / Wood Engraving
In: BL; BLBS; MET; NCC; NUC–1956; OCLC; UBA.

M

Maaskamp (Evert)   195

Manier om op de Engelsche wijze in het koper te graveeren, door hun genoemd 'acqua tinta' / [Evert Maaskamp?]. - [Amsterdam?], [1810?]. - [8] fol. ; 34 cm.
§ Title means: Manner to engrave copper in the English way, called 'acqua tinta' by them
Manuscript.
Language: Dutch.
Dating by means of the watermarks 'Vrijheid' and 'J. Kloppenburg' (Churchill 99). Papermaker J. Kloppenburg was active 1791–1810.
The text starts on fol. [2]r.
The ms. contains instructions for liquid-grain aquatint and lift-ground. These techniques were first applied in the Netherlands by about 1810 by the engraver and publisher Evert Maaskamp (1769–1834). Other Dutch engravers used Ploos van Amstel's transfer technique and only gradually started using liquid-grain aquatint from 1815 onwards. Maaskamp, as a publisher, had contacts with English publishers from shortly after 1800. He would have learned how to use liquid-grain aquatint in England, first applied it as an engraver in the Netherlands and introduced it to other Dutch engravers.
1 –
Aquatint / Lift-ground
2 –
Copper
In: RMA, Ms. 310 K.

Maberly (Joseph)
See: **Fielding** (Theodore Henry Adolphus) [No. 100.3].

McLaughlin (Mary Louise)   196

Etching : a practical manual for amateurs / M[ary] Louise McLaughlin. - Cincinnati, Ohio : Clarke.
§ Announcement: *American Art Review*, 1 (1879): 40.

Although Ms McLaughlin published regularly, this title was never issued.
NOT PUBLISHED
In: *Levis 1910*: 58; *Levis 1912*: 106.

Mai (Johann)   197.1

Die Radierung und das Ätzen in Kupfer und Stahl zur Erzeugung druckbarer Platten : nebst einer Anleitung zum Keramischen Plattendruck / von Johann Mai. - Dresden : Gneist & Wenzel, [1924]. - 47, [3] p. : 17, [2] Abb. ; 20–20.5 cm.
Supplier of roller presses: p. 30.
Index: p. [1].
Advertisement: p. [2].
§ Title means: Etching in copper and steel for making printable plates: next to a manual for ceramics plate printing
1 –
Crayon Etching / Line Etching
2 –
Copper / Steel / Zinc
3 –
Ink / Paper / Press / Printing in Black / Printing Monochrome
4 –
Ceramics / Troubleshooting
5 –
Health and Safety
In: DNB-L; HGKB; KVK; Priv.Coll.

197.2

Die Radierung und das Ätzen in Kupfer und Stahl zur Erzeugung druckbarer Platten : nebst einer Anleitung zum Keramischen Plattendruck / von Johann Mai. - Dresden : Gneist & Wenzel, 1930. - 47 p. : ill.
NOT SEEN
In: DBI-VK; KVK.

Malepeyre (François)
See: **Perrot** (Aristide-Mitchel) [No. 234.2].

Manual de curiosidades   198

Riquezas y maravillas : ó sea secretos de artes y oficios, curiosidades y conocimientos útiles é indispensables para todos. - [6th and 7th ed.]. - Madrid : [M. Romeral y Fonseca], 1853–1854. - 4 vol. ; 12 cm.
§ Title means: Richess and marvels: or the secrets of arts and crafts, curiosities and knowledge useful and indispensable for all
BNM: '1er. tratado: Arte de disecar toda clase de aves, animales cuadrúpedos é insectos. Modo de conservar los vejetales y minerales. Preparación de los barnices y licores al efecto ... - Sesta edición. - 1 hoj. + 141 pág. + 1 hoj. 2º tratado: Arte de pintar dividido en tres partes ... – 181 pág. + 3 hoj. 3º tratado: Arte de fabricar barnices y charoles. - Setima edición, aumentada ... - 110 pág. 4º tratado: Manual de curiosidades y secretos útiles. Arte del tocador y quita-manchas ... Sétima edición. - 143 pág. + 8 hoj'.
Earlier editions not found.
– Vol. 4: Manual de curiosidades y secretos útiles. Arte del tocador y quita manchas. Modo práctico de grabar en cobre, hierro, acero, al agua fuerte, sobre el cristal, sobre espejos, y modo de azogarlos; secreto para teñir la madera de todos los colores. Escrito practicamente segun los adelantos del dia, y puesto al alcance de todos. - Sétima edicion. - Madrid : Imp. de D.M. Romeral y Fonseca, 1854. - 143, [17] p. ; 12 cm.
Contents: p. [2].
MIP: pp. 5–12.
§ Title means: Manual of useful curiosities and secrets. The art of removing spots. Practical manner of engraving in copper, iron, steel, with strong water, on crystal, on mirrors and the manner of laying mercury on them; secret of staining wood in all kinds of colours
Title description after photocopy.
1 –
Line Etching
2 –
Copper
In: BNM; *Blas Benito 1994*: 70; NUC–1956.

Marciana manuscript   199.1

[Marciana manuscript]. - [Gaeta], [c. 1570].
§ Manuscript.
Language: south Italian dialect.
MIP: Per stampare in sul rame. - Fol. 157v-158r.
§ Title means: Printing from copper
The manuscript is generally known as the 'Marciana manuscript'.
Contains a recipe for making black intaglio ink, inking, wiping and intaglio printing by hand. The manuscript is written in Gaeta, a town northwest of Naples, around 1570, but many recipes go back to 1520 and to a more northern provenance. An even earlier date for a number of the original recipes is likely, such as in the last quarter of the fifteenth century; private correspondence with Claudio Seccaroni, 30–31 March 2010.
The ms. is incompletely transcribed and translated by Merrifield, who left out this recipe; *Merrifield 1967*, pp. 618–619/620–621, the missing recipe on intaglio printing is no. 330.
Title description after the transcription, see [No. 199.2].
2 –
Copper
3 –

Ink / Printing in Black / Rubbing
NOT SEEN
In: BMa, Ms. IT. III–10.

<div align="right">199.2</div>

L'inchiostratura delle stampe. Due ricette cinquecentesche ricongiunte / Claudio Seccaroni.
In: Kermes, arte e tecnica del restauro. - Vol. 57 (2005). - P. 28.
MIP: p. 28.
§ Transcription of the intaglio printing recipe in: Gaeta 1570 [No. 199.1].
In: UBH.

<div align="right">199.3</div>

Segreti d'arti diverse nel regno di Napoli. Il manoscritto It. III.10 della Biblioteca Marciana di Venezia / F. Frezzato, Claudio Seccaroni. - Saonara (Pd) : Il Prato, 2010. - 203 p. : ill. ; 24 cm. - (Il laboratorio dell'arte ; 5).
MIP: p. 152, no. 330.
ISBN 978-88-6336-088-2
§ Title means: Secrets of various arts from the kingdom of Naples. The manuscript It. III.10 of the Marciana library in Venice
Transcription of the complete manuscript, including the intaglio printing recipe, of: Gaeta 1570 [No. 199.1].
NOT SEEN
In: UBH.

<div align="right">**Mariani** (Valerio)   200</div>

Della miniatura / del Valerio Mariani da Pesaro. - Padua, 1620[-1630?].
MIP: Per intagliar in rame con acqua forte / Valerio Mariani da Pesaro. - [1623?]. -
- No. CXIV, fol. 100v-103v : [2] fig.
§ Title means: About miniature – To engrave copper with strong water
Manuscript.
Language: Italian.
The recipe before this is dated, fol. 100r: 'A di 20 7mbre MDCCXIII' (20 September 1623).
Contains instructions for applying the ground, biting the plate and preparation of mordants. The figures show several plates placed in a slanted trough and mordant being ladled over the plates.
Title description after transcription by Erma Hermens of the Yale ms. The Leyden (UBL) and Yale copies have only minor textual differences. The Vatican copy contains only part of the ms. The ms is the subject of her dissertation (publication forthcoming).
1 –
Line Etching
2 –
Copper
3 –
Hand-colouring
In: UBL, Dousa-room, Codex Vossius, Ger. Gall. 5q; BAV, Urb. Lat. 1280; YU-BL, Ms. M. 372.

Marini (Felice Melis)
See: **Melis-Marini** (Felice) [No. 205].

<div align="right">**Marsh** (Roger)   201</div>

Imaginative printmaking / Roger and Glenda Marsh ; black-and-white photogr. by the authors. - London [etc.] : Pitman, 1975. - VIII, 120 p. : 133 fig. in b/w, 6 pl. in colour ; 26 cm.
Contents: p. V.
MIP: pp. 110–111 : fig. 126.
Suppliers: p. 115.
Index: p. 119.
ISBN 0-273-00489-1 (hardcover)
§ The illustrations are diagrams, photographs and reproductions.
Meant for students and 'young readers'.
1 –
Drypoint
2 –
Plastic / Wood
3 –
Printing in Black / Rubbing
4 –
Linocut / Lithography / Marbling / Monotype / Nature Printing / Rubbing / Screen Printing / Stamping / Woodcut
In: BL; NCC; OCLC; SBH.

Martial (Adolphe Potémont)
See: **Potémont 1** (Adolphe Théodore Jules Martial; Paris 1864) [No. 247].
See: **Potémont 2** (Adolphe Théodore Jules Martial; Paris 1873) [No. 248].

<div align="right">**Martin** (Judy)   202.1</div>

The encyclopedia of printmaking techniques / Judy Martin ; photogr. Duncan Phillips … [et al.]. - London : Headline, 1993. - 176 p. : ill., partly in colour ; 22.5 × 22.5 cm.

Includes index.
ISBN 0-7472-0842-5 (softcover)
§ **Woods 1** (Louise; London 1996) [No. 361] is similar in style and has a number of prints in common, too.
NOT SEEN
In: BL; COPAC; KVK.

202.2
The encyclopedia of printmaking techniques / Judy Martin ; photogr. Duncan Phillips … [et al.]. - New ed. - London : Headline, 1993. - 176 p. : ill., partly in colour ; 22.5 × 22.5 cm.
Includes index.
ISBN 0-7472-7806-7 (softcover)
NOT SEEN
In: COPAC; KVK; ULC.

202.3
The encyclopedia of printmaking techniques / Judy Martin ; photogr. Duncan Phillips … [et al.]. - Turnbridge Wells : Search Press, 2001. - 176 p. : [280] ill. ; 22.5 × 22.5 cm.
Contents: p. 6.
MIP: pp. 76–109 : [86] ill.
Index: p. 172.
ISBN 0-85532-987-4 (softcover)
§ Title on front cover: The encyclopedia of printmaking techniques. A step-by-step visual directory of printmaking techniques, plus practical projects and an inspirational gallery of finished prints
The illustrations are photographs and reproductions.
1 –
Aquatint / Drypoint / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Viscosity Colour Printing
4 –
Linocut / Lithography / Monotype / Screen printing / Woodcut / Wood Engraving
In: KVK; Priv.Coll.

202.4
Gravure et impression : techniques et création / Judy Martin ; trad. de l'anglais par Irène Lassus. - Paris : Eyrolles, 2001. - 175 p. : ill., partly in colour ; 22.5 × 22.5 cm.
ISBN 2-212-02679-X (softcover)
ISBN 978-2-212-02679-5 (softcover)
NOT SEEN
In: BNP.

202.5
Grafische technieken / Judy Martin ; vertaling Lia Pot ; fotografie Duncan Phillips … [et al.]. - Kerkdriel : Librero, 2006. - 176 p. : [280] ill. ; 22.5 × 22.5 cm.
MIP: pp. 76–109 : [86] ill.
Index: p. 172.
ISBN 90-5764-675-7 (softcover)
§ Title on front cover: Grafische technieken, een geïllustreerde handleiding voor de traditionele en eigentijdse technieken
In: Priv.Coll.

Mash (Norman)
See: **Valuable secrets** [No. 342].

Matkevich (Leonard)   203
A printmakers introduction to photopolymer plate for intaglio and relief printmaking / Leonard Matkevich. - Balmain, NSW : Leonard Matkevich, 1994. - 25 fol. : ill. ; 30 cm.
2 –
Photopolymer Plate
3 –
Printing in Black / Relief Printing
NOT SEEN
In: NLA.

Maxwell (William Carl) 204.1
Printmaking : a beginning handbook / William C[arl] Maxwell ; photogr. by Howard Unger. - New York : Teachers College, 1976. - XXXII, 780 [?] p. : ill. ; 29 cm.
With literature.
NOT SEEN
In: OCLC.

204.2
Printmaking : a beginning handbook / William C[arl] Maxwell ; photogr. by Howard Unger. - Englewood Cliffs, N.J. : Prentice-Hall, cop. 1977. - XXIV, [2], 405 p. : [387] ill. in b/w, [31] in colour ; 23.5 & 24.5 cm. - (The creative handcrafts series).
Contents: p. IX.

MIP: pp. 1–111, 356–361 : [118] ill., of which [16] in colour.
Suppliers: p. 382.
Glossary: p. 392.
Literature: p. 402.
With literature.
Stocklist: backside of paper cover.
ISBN 0-13-710699-9 (hardcover)
ISBN 0-13-710681-5 (softcover)
§ The illustrations are numbered per part of a chapter and are diagrams, photographs and reproductions.
The softcover edition is 23.5 cm high, the hardcover edition is 24.5 cm high.
The softcover edition does not have a stocklist.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Soft-ground / Stipple Engraving
2 –
Copper / Plastic / Steelfacing / Zinc
3 –
Blind Embossment / Chine Collé / Hand-colouring / Multiple-plate Printing / Paper / Press / Printing in Black / Printing Polychrome / Viscosity Colour Printing
4 –
Collagraph / Ink / Jigsaw Print / Linocut / Lithography / Monotype / Screen Printing / Woodcut / Wood Engraving
5 –
Aesthetics / Art History / Conservation and Restoration
In: *Blas Benito 1994*: 83; LC; Priv.Coll. (3×)

Mayerne (Theodor)
See: **Turquet de Mayerne 1** (Theodor) [No. 340].
See: **Turquet de Mayerne 2** (Theodor) [No. 341].

Melis-Marini (Felice)   205.1

L'incisione d'arte. Brevi notizie techniche / Felice Melis-Marini. - [Milano], [1900–1915].
§ Manuscript.
Language: Italian.
This manuscript is possibly the basis of the following publication; Melis-Marini was born and lived in Cagliari.
Title description based on *Scano 1993*, pp. 195–196.
NOT SEEN
In: BUC, manoscritto XXVII; *Scano 1993*, pp. 195–196.

205.2

L'acquaforte : manuale pratico / Felice Melis-Marini. - [1st ed.]. - Milano : Hoepli, 1916. - VIII, 170 p. : tav. X ; 8º. - (Manuali Hoepli).
§ Title means: Etching: practical manual
NOT SEEN
In: BLBS; IBK 1978, 15 (1917–1918): no. 2482.

205.3

L'acquaforte : manuale pratico / Felice Melis-Marini. - Seconda ed. riveduta ed ampliata. - Milano : Hoepli, 1924. - XII, 188, [22] p. : 10 tav. 19 reprod., of which [1] in colour ; 15.5 cm. - (Manuali Hoepli).
Contents: p. IX.
Addenda & corrigenda: p. XI.
§ The text is largely descriptive, less instructive.
All reproductions after Melis-Marini's works.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steelfacing
3 –
Ink / Paper / Printing in Black
4 –
Monotype
5 –
Art History
In: *Blas Benito 1994*: 83; BNM; NUC–1956; OCLC.

205.4

El aguafuerte y demás procedimientos de grabado sobre metal / Felice Melis-Marini. - Barcelona : Meseguer, 1954. - 145 p. : X pl. ; 16.5 cm. - (Manuales Meseguer ; 14).
§ Title means: Etching and other techniques of engraving on metal
NOT SEEN
In: *Blas Benito 1994*: 83; BNM.

205.5

El aguafuerte y demás procedimientos de grabado sobre metal / Felice Melis-Marini ; trad. de Joaquin Arce. - [Repr.]. - Barcelona : Sucesor de E. Messeguer, 1973. - 140 p. : X pl. ; 17 cm.
ISBN 84-7106-059-0
NOT SEEN

In: *Blas Benito 1994*: 83; BNM.

Mellan (Claude)
See: **Tempesti** (Domenico) [No. 334].

Mels (R.)
See: **Erremes** (H.) [No. 092].

<div align="right">

Método   206.1
</div>

Método para gravar al agua fuerte y sobre marfil / [etch. by Abraham Bosse]. - [S.l.], [c. 1700]. - [18] bifol. : [2] drawings, [2] etch. ; 4º.
§ Manuscript.
Language: Spanish.
The first fifteen bifolia contain a complete description of making an etching. They are followed by a bifolium with recipes for etching grounds and mordants. The final bifolium is about engraving ivory, but probably not for making printing plates.
The manuscript is not dated.
The two drawings in ink and watercolour illustrate the tools used and the manner of engraving. The two etchings bound at the back are by Abraham Bosse.
Title description after transcription, see: 1993 [No. 206.2].
1 –
Line Engraving / Line Etching
2 –
Copper / Ivory
3 –
Ink / Printing in Black
In: BNM, ms. 9338.

<div align="right">

206.2
</div>

El primer tractat de gravat calcogràfic a Espanya / Eva Figueras Ferrer.
In: Butlletí del Museu Nacional d'Art de Catalunya. - Vol. 1 (1993), no. 1. - P. 263–274 : [4] fig.
MIP: pp. 266–274 : 2 fig.
§ The author dates the manuscript on various grounds in the period 1643–1679. The materials and techniques described were in use in the period suggested. The drawing with the tools shows scraper-burnisher combination tools with the scraper ends having three-sided blades, however. A three-sided blade is depicted in: **Filleau des Billettes** (Paris 1693–1698) [No. 102]: 114, pl. [1] no. T. From the mid-eighteenth century the tool is found commonly. As Spain did not have a technically advanced printmaking culture in the later seventeenth century, it is unlikely that such a modern instrument would have been in use there at the time. It would therefore be safer to place the provenance of the manuscript around or after 1700, unless perhaps the text was indeed written in the seventeenth century and the drawings were made and inserted at a later date.
In: MNAC.

<div align="right">

Meusnier (Georges)   207.1
</div>

Traité pratique de la gravure a l'eau-forte (paysage et figure) / Karl Robert. - Paris : Laurens, 1891. - [1st ed.]. - 137, [7] p. : front., [38] ill. ; 25.5 cm. - (Bibliothèque d'enseignement pratique des beaux-arts ; 10).
List of works by the author: pp. 2, [2], backside cover.
Contents: p. 135.
Stocklist: p. [2].
Advertisement: backside cover.
With literature.
§ Title means: Practical treatise on etching (landscape and figure)
Karl Robert is the pseudonym of Georges Meusnier.
The illustrations are diagrams and reproductions.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Copper / Steelfacing
3 –
Press / Printing in Black
5 –
Aesthetics / Art History
In: *Blas Benito 1994*: 86; BLBS; BN; CCB; *Figueras Ferrer 1992*: 1065 ; NCC; NUC–1956; OCLC (4×); Priv.Coll.; SPKA; TUD; UBA; UBU.

<div align="right">

207.2
</div>

Traité pratique de la gravure a l'eau-forte (paysage et figure) / Karl Robert. - Nouvelle éd. - Paris : Laurens, 1928. - 128 p. : front., [38] ill. ; 25.5 cm.
List of works by the author: p. 2, backside cover.
Stocklist: p. 2.
Contents: p. 126.
With literature.
§ The text has been reset but is identical to the text of the edition Paris 1891, except that the spelling has been slightly revised.
The illustrations are the same.
In: *Blas Benito 1994*: 86; Priv.Coll.

<div align="right">

Meynier (Johann Heinrich)   208.1
</div>

Anleitung zur Aetzkunst besonders in Crayon und Tuschmanier / nach eigenen praktischen Erfahrungen hrsg. von Johann Heinrich Meynier. - Hof :

bey Gottfried Adolph Grau, 1804. - VIII, 230, [2] p. : I–Xa, Xb-XI Tab., partly in colour ; 19.5–20.5 cm.
Contents: p. V.
Literature: p. 2 (annotated).
Suppliers: pp. 61, 135.
List of illustrations: p. 211.
Specimen: Tab. III, Fig. 2–4; Tab. IV, Fig. 6, 8–9; Tab.V–VII, Tab. Xa-b.
Addenda & corrigenda: p. [1].
§ Title means: Manual for etching especially in crayon and wash manners
The preface is dated, p. IV: 'Erlangen den 20 März 1804'.
Plates V, VI, VII and Xb are printed in red-brown.
Intended audience, p. IV: 'mein Werk [ist] mehr für Dilettanten als für Personen geschrieben …, welche die Kunst schon lange treiben'.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Échoppe / Line Etching
2 –
Copper
3 –
Multiple-plate Printing / Printing Polychrome
5 –
Aesthetics
In: ABK; *Börsenverein 1885*; BS; DBI-VK; NUC–1956; ÖNB; RMA; *Singer & Strang 1897*: no. 85; UBAB.

208.2

[Notes on etching]. - [S.l.], [1805–1850?].
In: **Meynier** (Hof 1804) [No. 208.1]. - Back flyleaf verso.
§ Manuscript.
Language: German.
1 –
Line Etching
In: ABK, G a 15.

208.3

[Notes on intaglio printmaking]. - [S.l.], [c. 1810?]. - [4] fol. ; 19 cm.
In: **Meynier** (Hof 1804) [No. 208.1]. - Bound after the text.
§ Manuscript.
Language: German.
The first recipe is for offsetting a print onto porcelain by saponifying the printing ink with an alkaline solution; with reference to 'S. Krünitz, Encyclop. 56. Theyl p. 549', which was published in 1792. The other recipes are for etching grounds and etching fluids. The recipe for a white etching ground (fol. 2r) is also taken from 'Krünitz Encyclop. 56. Theil p. 427'. At the top of fol. 2v it says'(nach Tischbein.)', followed by recipes for etching grounds, stopping-out varnish, etching fluid and their preparation. This is probably the copy of Tischbein's text in vol. 56 of Krünitz's encyclopaedia; **Tischbein** (Berlin 1792) [No. 337.2]. Tischbein's crayon etching process is described on fol. 3r–v.
1– Crayon Etching / Line Etching
In: RMA, 101 G 113.

Middleton (Max J.)   209.1
Etching and intaglio printing. A practical guide for beginners / M[ax] J. Middleton. - [1st ed.]. - London : Ward Lock, 1970. - 64 p. : [44] ill. ; 24.5 cm.
Contents: p. 5.
Index: p. 64.
ISBN 7063-113-5
§ The illustrations are diagrams, photographs and reproductions.
The line at the bottom of p. 52 stops in the middle of the sentence and does not continue on the next page.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Iron / Copper / Steelfacing / Zinc
3 –
Casting / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
5 –
Health and Safety
In: BL; BLBS; BNB50; CCB; OCLC (13×); ULC.

209.2

Etching and intaglio printing. A practical guide for beginners / by M[ax] J. Middleton. - [2nd ed.]. - New York : Drake, 1972. - 64 p. : front., [44] ill. ; 24.5 cm.
Contents: p. 5.
Index: p. 64.
ISBN 87749-161-5 (hardcover)
§ Identical to the edition London 1970.
The publisher's imprint on the spine is 'Ward Lock'.
In: OCLC (10×); Priv.Coll.

Montdorge (Antoine Gauthier de)
See: **Le Blon** (Jacque Christoph) [No. 180.2].

[Notebook] / Franciscus Johannes Moretus. - [Antwerpen], [c. 1760].
MIP: Notitie van hetgenen eenen plaet Drucker noodigh heeft s'jaers. - Fol. 9r.
§ Title means: Note of what a plate printer needs per year
Manuscript.
Language: Dutch.
The *Notitie* itself is dated: 'desend jaere 1758' (in this year 1758).
Concerns the materials needed for intaglio printing ink and intaglio printing; their amounts and costs.
Title description after the transcription of: 1966 [No. 210.2].
3 –
Ink / Printing in Black
In: MPM, Archives 697, no. 101.

Een aantekenboek van Franciscus Johannes Moretus nopens technische aspecten van het drukkersbedrijf, opgesteld omstreeks 1760 / L. Voet. In: De Gulden Passer. - Vol. 44 (1966). - P. 229–244.
MIP: 3. Materiaalverbruik voor diepdrukpers. - P. 234.
In: KB.

Morris (Hebe)
See: **D'Arcy Hughes** (Ann) & **Vernon-Morris** (Hebe) [No. 071].

The art of aquatint / by B[enjamin] F[rancis] Morrow ; [preface by John Taylor Arms]. - New York : Putnam's Sons, 1935. - XVI, 140 p. : front., 45 pl. ; 25–25.5 cm.
Contents: p. IX.
List of illustrations: p. XI.
Literature: p. 131.
Glossary: p. 135.
With literature.
§ The plates are reproductions.
1 –
Aquatint / Crayon Etching / Lift-ground / Mezzotint / Soft-ground
2 –
Copper
3 –
Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Art History
In: BL; *Blas Benito 1994*: 84; BLBS; CCB; MET; NCC; NUC–1956; OCLC; Priv.Coll.; UBL-KHI.

Diepdrukvarianten / Marjon Mudde ; [introduction by C. van Herkhuizen]. - Utrecht : Landelijk Overleg Grafische Ateliers, cop. 1987. - [4] p., I–24, II–26, III–26, IV–40 col. : [1] pl. inside frontcover, [39] pl., of which [15] in colour ; 32 cm.
General contents: p. [4].
Contents: col. I–1.
Edition: 100 copies.
§ Title means: Varieties of intaglio printing
The preface is dated June 1987. The first copy was presented on 1 July 1987, the edition was completed in the course of 1988.
All impressions are specimens of the printing techniques described.
Each plate has one to three impressions. The plates are inserted in plastic folders. Text and plastic folders are kept in a binder and the binder is stored in a cassette.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steelfacing / Zinc
3 –
Blind Embossment / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing
5 –
Aesthetics
In: KB; NCC; Priv.Coll. (3×); RAA; RMA; SMA; UBA.

Ausführliche Abhandlung über die Silhouetten und deren Zeichnung, Verjüngung, Verzierung und Vervielfältigung / von dem Verfasser des physiognomischen Cabinets [Friedrich Christoph Müller]. - Frankfurt [am Main] ; Leipzig : bey Philipp Heinrich Perrenon, 1780. - [6], 258 p. : XI Kupfertafeln ; 17.5–18 cm.
Contents: p. [6].

MIP: pp. 221–233 : Pl. II, Fig. 57–58.
With literature.
§ Title means: Detailed manual about silhouettes and how to draw, diminish, decorate and multiply them
The XI *Kupfertafeln* contain 58 *Figuren*.
This publication is found under the title in the various catalogues and not under the author's name.
'Screen Printing' means printing with stencils here.
1 –
Line Etching
2 –
Copper
3 –
Ink / Paper / Textile
4 –
Screen Printing / Woodcut
5 –
Aesthetics
In: DBI-VK; NSUG; NUC–1956; RMA.

Müller (Johann Caspar)
See: **Gessner** (Christian Friedrich) [No. 118].

Muir (Pauline)
See: **Welden** (Dan) [No. 351].

Mumberson (Stephen)
See: **Bonnell** (Mandy) & **Mumberson** (Stephen) [No. 038].

N

Nanteuil (Robert)
See: **Tempesti** (Domenico) [No. 334].

Neale (Hamilton S.)   214
The art of plate printing / H[amilton] S. Neale ; with an historical sketch by Theodore A. Isert. - Springfield, Mass. : published privately by the Linweave Association, 1927. - 65, [2] p. : engr. titlep. ; 20.5–21 cm.
Contents: p. 5.
Advertisement: p. [1], backside of the paper wrapper.
§ The preface is dated, p. 8: 'Brewood-Washington, May 7th, 1927'.
The author directs himself to his 'fellow plate printer' (p. 7), this manual is definitely not written for amateurs.
Linweave was a paper producer. The book is printed on and bound in their papers, while the advertisement lists the distributors of their papers.
2 –
Copper / Steel / Steelfacing
3 –
Chine Collé / Paper / Parchment / Press / Printing in Black / Printing Monochrome
5 –
Art History
In: *Bridson & Wakeman 1984*: no. B76; NUC–1956; OCLC.

Netto 1 (Friedrich August Wilhelm) 215
Anweisung zur Selbsterlernung der Radir- und Aetzkunst in Kupfer / größtentheils aus eigner Erfahrung abgeleitet und zum allgemeinen Gebrauch für Künstler, sowie für Ingenieurs und Artilleristen, Berg- und Forstmänner, welche ihre Zeichnungen auf diese Art vervielfältigen wollen, entworfen von F[riedrich] A[ugust] W[ilhelm] Netto. - Dresden : In der Arnoldischen Buchhandlung, 1815. - xii, 36 p. : [1] folding pl. ; [c. 18 cm].
Literature: p. iv.
Contents: p. v.
List of illustrated tools: p. x.
Suppliers: pp. xii, 4, 35.
§ Title means: Instructions to teach yourself etching in copper
The preface is dated, p. iv: 'Dresden, im Jänner 1815'.
Intended audience, p. iii: 'zum Unterricht junger Künstler'.
Title description after microfilm.
1 –
Drypoint / Line Engraving / Line Etching
2 –
Copper
4 –
Troubleshooting

5 –
Aesthetics
In: GV, vol. 102: 299, col. 1; SLSU.

Die Kunst in Metall zu graviren. Oder: Anweissung, auf Kupfer, Stahl, Eisen, Zink und andere Metalle zu zeichnen, zu radiren, zu ätzen, zu stechen und dann das Entworfene mechanisch oder chemisch abzudrucken. Zur Selbstbelehrung für Künstler, Gewerbtreibende und Dilettanten / von Fr[iedrich] A[ugust] W[ilhelm] Netto. - Quedlinburg ; Leipzig : Druck und Verlag von Gottfr. Basse, 1840. - 80 p. : 36 Fig. on 3 Taf. ; 21.5 cm.
Contents: p. 75.
Stocklist: p. 78.
With literature.
§ Title means: The art of engraving in metal (etc.)
Intended audience, title page: 'Künstler, Gewerbtreibende und Dilettanten'.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Soft-ground
2 –
Copper / Iron / Steel / Zinc
3 –
Ink / Press / Printing in Black
4 –
Lithography
In: *Börsenverein 1885*; CCB; GV, vol. 102: 299, col. 1; NCC; NUC–1956; OCLC; RMA; *Singer & Strang 1897*: no. 160.

Der praktische Graveur : ausführliche Anleitung zur Erlernung der Gravierkunst / Robert Neubert. - Leipzig : Schlag, 1907. - 152 p. : ill. ; 18 [?] cm.
§ Title means: The practical engraver: detailed instructions for learning how to engrave
NOT SEEN
In: KVK.

217.2

Der praktische Graveur : ein Lehr- und Handbuch für den Graveur und Goldschmied, sowie verwandte Gewerbe : ausführliche Anleitung zur Erlernung der Gravierkunst / Robert Neubert. - 2. verb. Aufl. - Leipzig : Schlag, 1912. - 208 p. : Fig., V Tab. ; 18 cm.
§ Preface to the 2nd ed.: 'Dresden, im September 1912'.
NOT SEEN
In: KVK; UBA.

217.3

Der praktische Graveur : ein Lehr- und Handbuch für den Graveur und Goldschmied sowie verwandte Gewerbe. Ausführliche Anleitung zur Erlernung der Gravierkunst / von Robert Neubert. - Dritte bedeutend verbesserte Aufl. - Leipzig : Schlag, 1921. - IV, 218, [6] p. : front., 122, [1] Fig., V Taf. ; 18.5 cm. - (Fachbibliothek des Edelmetallgewerbes).
MIP: pp. 118–121.
Contents: p. 214.
List of illustrations: p. 217.
Stocklist: p. [1] at the back.
List of works in the series: p. [2] at the back.
§ Chiefly a manual for the decorating engraver, but with specific references to aesthetics for the engraver of printing plates. Throughout the text references to engraving and etching suitable for the manual intaglio processes are given.
Preface to the third edition, p. IV: 'Dresden, im Mai 1921'.
The *Figuren* are diagrams, the *Tafel* are photographs of manners of engraving.
1 –
Line Engraving / Line Etching
2 –
Brass / Copper / Glass / Silver / Steel / Zinc
3 –
Rubbing
4 –
Goldsmithing / Relief printing / Wood Engraving
5 –
Aesthetics / Health and Safety
In: Priv.Coll.

J'imprime en couleurs / Christiane Neuville ; photos de Sophie Laverrière. - [Paris] : Gallimard, 1975. - 95 p. : ill., mainly in colour ; 18 cm. - (Kinkajou ; 23).
Contents: p. 2.
MIP: pp. 76–83 : [11] ill.
§ Title means: I print in colours
Title on cover: J'imprime en couleurs : de la patatogravure à la sérigraphie, l'impression au bouchon, au rouleau, au pochoir, sur papier, sur tissus, et pour rire, devenez faux-monnayeur!
Manual for children
NOT SEEN
In: KVK.

Drukken. Richt je eigen drukkerij op en teken een ontwerp voor linoleum, hout, zijde of etsplaat en druk dan op papier, stof, glas en hout / Christine [sic!] Neuville ; foto's Sophie Laverrière ; [transl.] M.C. Umbgrove-Jansen ; redactie Herma Vogel. - Amsterdam : Ploegsma, 1976. - 95, [1] p. : ill., mainly in colour ; 18 cm. - (Drie sterren boek : weten, maken spelen).
Contents: p. 2.
MIP: pp. 76–83 : [11] ill.
List of titles in the series: p. [1] backside cover.
ISBN 90-216-0098-6 (hardcover?)
§ Translation of the edition: Paris 1975.
1 –
Drypoint / Line Etching
2 –
Zinc
3 –
Printing in Black / Press
4 –
Linocut / Lithography / Screen Printing / Woodcut
5 –
Art History
In: KB (2×); MMW; NNC; UBA; UBN; UBU.

Newman 1 (Thelma R.) 219.1

Plastic as an art form / Thelma R. Newman ; [all photogr. by Lou Thurrott unless credited otherwise]. - [1st ed.]. - Philadelphia ; New York : Chilton ; Toronto : Ambassador Books, cop. 1964 (= 1965). - XXIV, 339 p. : [190] ill., of which [12] in colour ; 26.5 cm.
Contents: p. VII.
List of illustrations: p. XIII.
List of reproduced artists: p. XIX.
MIP: pp. 173–175, 234 : [2] ill.
Suppliers: p. 302.
Trade names for plastics, suppliers: p. 306.
Literature: p. 319.
Glossary: p. 323.
Index: p. 331
With literature.
§ The illustrations are photographs and reproductions.
'This is essentially a source book for artists, craftsmen, and art educators who desire a foundation in plastics as an art form.'
1 –
Drypoint
2 –
Copper / Plastic / Zinc
3 –
Casting / Printing in Black
4 –
Line Block
5 –
Health and Safety
In: OCLC; UBL-KHI.

219.2

Plastic as an art form / Thelma R. Newman ; [all photogr. by Lou Thurrott unless credited otherwise]. - [1st ed.]. - London : Pitman, cop. 1964 [= 1965]. - XXIV, 339 p. : [190] ill., of which [12] in colour ; 26.5 cm.
Contents: p. VII.
List of illustrations: p. XIII.
List of reproduced artists: p. XIX.
MIP: pp. 173–175, 234 : [2] ill.
Suppliers in UK: p. 302.
Trade names for plastics, suppliers: p. 306.
Literature: p. 319.
Glossary: p. 323.
Index: p. 331
With literature.
In: NCC; OCLC; RCE; TUD; ULC.

219.3

Plastic as an art form / Thelma R. Newman. - Rev. ed. - London : […], 1969. - XXI, 403 p. : ill. : 27 cm.
Literature: p. 385
Index: p. 395.
NOT SEEN
In: ULC.

219.4

Plastic as an art form / Thelma R. Newman. - Rev. ed. - Philadelphia ; New York : Chilton, 1969. - XXI, 403 p. : ill. : 27 cm.
Literature: p. 385

Index: p. 395.
NOT SEEN
In: OCLC.

Plastic as an art form / Thelma R. Newman. - Rev. ed. - London [etc.] : Pitman ; Philadelphia : Chilton ; Ontario : Thomas Nelson, 1972. - XXI, [3], 403, [2] p. : [364] ill., of which [15] in colour ; 27 cm.
Contents: p. VII.
List of illustrations: p. XIII.
MIP: pp. 202, 204–207, 270–271 : [4] ill.
Health and Safety: p. 365.
Suppliers: p. 367.
Trade names for plastics: p. 374.
Literature: p. 385.
Glossary: p. 388.
Index: p. 395.
ISBN 0-273-31863-2 (hardcover)
In: UBA.

Newman 2 (Thelma R.) 220

Innovative printmaking : the making of two- and three-dimensional prints and multiples / by Thelma R. Newman. - New York : Crown, cop. 1977. - XII, 306 p. : ill., 23 pl. in colour ; 26.5 cm.
Contents: p. VI
List of reproduced artists: p. IX.
MIP: pp. 22–29 : [19] ill.
Literature: p. 295.
Suppliers: p. 297.
Index: p. 301.
Stocklist: backside cover
ISBN 0-517-51589-9 (hardcover)
ISBN 0-517-51599-7 (softcover)
ISBN 0-517-52960-2 (softcover)
§ The illustrations are photographs and reproductions.
1 –
Collagraph
2 –
Plastic
3 –
Casting / Blind Embossment / Plastic / Printing Polychrome / Textile / Viscosity Colour Printing
4 –
Digital Printmaking / Decalcomania / Lithography / Photomechanical Processes / Screen Printing
5 –
Art History
In: *Figueras Ferrer 1992:* 1650; BNM; NCC; OCLC; Priv.Coll.; SBH.

Nieuwendijk (M.H.H.)
See: **Vial** (C.C.) & **Nieuwendijk** (M.H.H.) [No. 348].

Nitzsche (Carl Gottlieb)
See: **Bosse** (Abraham) [No. 042.23].

Notes 1   221

[Notes on etching]. - [S.l.], [1600–1700].
§ Manuscript.
Language: English.
Harley: 'information on varnish and grounds, with a reference to the etcher, Callot, on folio 1'.
1 –
Line Etching
NOT SEEN
In: BL, Ms. Sloane 228; *Harley 1969*: 5.

Notes 2   222

[Notes on etching]. - [S.l.], [1600–1700].
§ Manuscript.
Language: English.
Harley: 'Folios 38–54v include additional matter on gilding, oil colours, priming, etching, a varnish attributed to Mayerne, and flesh tints said to have been used by Van Dyck and Lely.'
1 –
Line Etching
NOT SEEN

In: BL, Ms. Additional 12461; *Harley 1969*: 5.

O

Oeconomisch Encyclopädie
See: **Tischbein Jr.** (Johann Heinrich) [No. 337.1].

Oliva (Clara)
See: **Catafal** (Jordi) & **Oliva** (Clara) [No. 061].

Orlandi (Pellegrino Antonio)   223.1

Abecedario pittorico : nel quale compendiosamente sono descritte le patrie, i maestri … / il tutto disposto in alfabetto … da Pellegrino Antonio Orlandi. - Bologna : Pisatti, 1704.
§ Title means: The pictorial ABC: in which are methodically described the countries, masters (etc.)
NOT SEEN
In: KVK.

                    223.2

L'Abecedario Pittorico, dall' autore ristampato, corretto et accresciuto di molti professori e di altre notizie spettanti alla pittura, etc. / Pellegrino Antonio Orlandi. - Bologna: Constantino Pisarri, 1719. - 519, [1] p. : ill. ; 25 cm.
NOT SEEN
In: BL; KVK.

                    223.3

L'Abecedario pittorico dall'autore ristampato, corretto, ed accresciuto di molti professori, e di altre notizie spettanti alla pittura / [Pellegrino Antonio Orlandi]. - Ed in quest' ultima Impressione con nouva … Aggiunta di altri Professori. - Firenze : Per Giorgio Ubaldi, 1731. - [4] fol., 472 p., [49] fol. : [5] pl. ; 4º.
NOT SEEN
In: KVK

                    223.4

L'Abecedario pittorico / [Pellegrino Antonio Orlandi] ; dall'autore ristampato, corretto, ed accresiuto di molti professori, e di altre notizie spettanti alla pittura, ed in quest'ultima impressione con nuova, e copiosa aggiunta di alcuni altri professori. - Napoli : A spese di Nicolò, e Vicenzo Rispoli, 1733. - [20], 473 + [100] p. : [5] pl. ; 23 cm.
Index: p. [1] at the back.
Alphabetical list of first names of artists. Index of surnames: pp. [1]–[30] at the back.
Literature: p. [31] at the back.
MIP: p. [58] at the back.
List of engravers: pp. [91]–[98] at the back.
§ The five plates are woodcuts between pp. [98] and [1] at the back and are illustrations of artists' marks.
Meant for collectors and amateurs of the arts, but with technical information about etching, painting and drawing.
1 –
Line Etching
2 –
Copper
4 –
Drawing / Painting
5 –
Art History
In: KVK; UBA; UBL; UBU.

                    223.5

Abecedario pittorico / del Pellegrino Antonio Orlandi … contenente le notizie de' professori di pittura, scoltura, ed architettura. - In questa editione corretto e notabilmente di nuove notizie accresciuto da Pietro Guarienti … [etc.]. - Venezia : appresso Giambatista Pasquali ; [printer] Giambatista Pasquali, 1753. - [14], 583, [1] p. : ill. ; 4º.
NOT SEEN
In: KVK; UBA.

                    223.6

Abecedario pittorico / del M.R.P. Pellegrino Antonio Orlandi : contente notizie de'professore di pittura, scoltura, ed architettura, in questa edizione corretto e notabilmente di nuove notizie accresciuto. - Napoli : [s.n.], 1763. - [20], 474, [98] p. : [5] woodcuts ; 24.5 cm.
Index on persons: p. [2] at the back.
Literature: p. [31].
MIP: p. [58].
Index on engravers: p. [91].
§ The dedication is dated, p. [6]: 'Dresda il primo Gennajo 1753'.
In: KVK; KB.

                    223.7

Abecedario pittorico dei professori piu illustri in pittura, scultura, e architettura nel quale sotto brevita si descrivono le notizie dei suddetti artefici antichi, moderni, e viventi, cifre, e tempi nei quali fioriscono … [etc.] / gia compilata da fra Pellegrino Antonio Orlandi … ed ora notabilmente accresciuta fino all'anno 1775. - Firenze : [s.n.], 1788. - [4], [8] p., 1704 col. : [4] pl. ; 4º.
NOT SEEN

In: KVK.

Osann (Gottfried Wilhelm)   224

Die Anwendung des hydroelektrischen Stromes als Aetzmittel / G.W. Osann ; [Gedicht von J. Schnerr]. - Würzburg : bei Voigt und Mocker, 1842. - 23 p. : front., [5] ill. ; 21.5–22 cm.
MIP: pp. 16–17.
§ Title means: The use of the hydro-electical current as etching means
All illustrations made by means of Osann's process.
The author recommends his process to scientists in order to prepare the printing plates to illustrate their publications.
1 –
Electrolytic Etching / Line Etching
2 –
Copper
4 –
Line Block
In: KVK; NUC–1956, Supplement; UBA.

Overbeke (Johan van) 225

[Gathering of various recipes] / [comp. by Johan van Overbeke]. - [Amsterdam?], [c. 1650–1700]. - 78 fol. ; 20 cm.
MIP: fol. 25r–v.
§ Manuscript.
Languages: German, Dutch.
Contains notes on etching. One recipe is in German.
The first recipe on etching ground, acid and etching (fol. 25r–v) is more or less the same as a similar recipe in: **Brugghen** (Amsterdam 1616) [No. 050.1]: fol. D3r–v.
1 –
Line Etching
In: KB, Ms. 71 J 31.

Oxley (Nigel)   226

Colour etching / Nigel Oxley. - London : A&C Black, 2007. - 128 p. : 129 ill., partly in colour. - 23.5 cm.
ISBN 978-0-7136-6820-9 (softcover)
§ Review: K. Jones, in *Printmaking Today*, 16 (2007) 4: 34.
NOT SEEN
In: KVK.

P

Padgett (H. West)   227

Simplified etching / H. West Padgett. - London : Reeves, [1938]. - […] : […] ; 8º
1 –
Line Etching
NOT SEEN
In: BL; BLBS.

Paduan manuscript   228.1

[The Paduan manuscript]. - [S.l.] [1590–1625]. - […] fol.
§ Manuscript.
Language: Italian.
1 –
Line Etching
2 –
Copper
NOT SEEN
In: BCP.

228.2

Original treatises : dating from the XIIth to XVIIIth centuries on the arts of painting, in oil, miniature, mosaic, and on glass; of gilding, dyeing, and the preparation of colours and artificial gems / by Mary Philadelphia Merrifield. - London : John Murray, 1849. - 2 vol. (cccxii, 321, [1]; v, [1], [323]–918 p.) : ill. ; 22 cm.
With corrigenda & addenda.
§ The pagination is continuous throughout both volumes.
Includes bibliographical references and index.
NOT SEEN

228.3

Original treatises on the arts of painting / Mary P[hiladelphia] Merrifield. - Unabridged and unaltered republ., repr. with an introd. and glossary / by S. M. Alexander. - New York: Dover, 1967. - 2 vol. (cccxii, 321, [1]; v, [1], [323]–918 p.) : ill. ; 22 cm.

§ Photomechanical reprint of: London 1849.
Vol. 2.
MIP: pp. 666–669. nos. 38–39; pp. 678–679, nos. 67–68.
§ English translations on the left, transcriptions on the right.
In: RCE.

228.4

Medieval and Renaissance Treatises on the Arts of Painting, Original Texts with English Translations / Mary Philadelphia Merrifield. - Mineola, NY : Dover, 1999.
§ Photomechanical reprint in one volume of: London 1849.
NOT SEEN
In: KVK.

Paglialonga (Bruno)   229

La calcografia : arte e tecnica dell'incisione in cavo su metalli / Bruno Paglialonga. - Pescara : Eugenio Riccitelli, 1985. - 176, [4] p. : XVIII Tav., [80] reprod. in b/w, [12] reprod. in colour, photogr. ; 24 cm.
Glossary: p. 157.
Polyglot: p. 163.
Literature: 168.
Index on artists: p. 169.
List of illustrations: p. 172.
Contents: p. [1].
Advertisement: p. [3].
§ Title means: The chalcography: art and technique of intaglio technique on metals
The *Tavole* are diagrams, which together with the photographs demonstrate techniques.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Relief Etching / Soft-ground / Stipple Engraving
2 –
Aluminium / Copper / Glass / Gold / Iron / Magnesium / Silver / Stone / Zinc
3 –
Chine Collé / Multiple-plate Printing / Ink / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Viscosity Colour Printing
4 –
Monotype
5 –
Art History / Conservation and Restoration / Original and Reproduction
In: OCLC; Priv.Coll.; RMA.

Palmer Robins (William)
See: **Robins** (William Palmer) [No. 269].
See: **Robins** (William Palmer) [No. 569].

Palomino de Castro y Velasco (Antonio)   230.1

El museo pictorico y la escala optica / Antonio Palomino de Castro y Velasco ; [engr. by Juan Bernabé Palomino]. - [1st ed.]. - Madrid, 1715, 1724. - 3 vol. in 2 bd. : ill. ; 31 cm.
§ Title means: The pictorial museum and the optical scale
The pagination of the second binding containing volumes 2 and 3 is continuous.
Reprint: Madrid 1947 [No. 230.6]
Title description after: Madrid 1947 [No. 230.6].
– Bd. 1, vol. 1: Tomo I. Theorica de la pintura, en que se describe su origen, essencia, especies, y qualidades, con todos los demàs accidentes, que la enriquezen, è ilustran. Y se prueban, con demonstraciones mathematicas, y folosoficas, sus mas radicales fundamentos. - Madrid : vendese en casa de Joseph del Villar y Villanueva, 1715. - [36], 306, [46] p. : front., 4 lam.
– Bd. 2, vol. 2: Tomo segundo. Practica de la pintura. En que se trata de el modo de pintar à el olio, temple, y fresco, con la resolucion de todas las dudas, que en su manipulacion pueden ocurrir. Y de la perspectiva comun, la de techos, angulos, teatros, monumentos de perspectiva, y optras cosas muy especiales, con la direccion, y documentos para las ideas, o assumptos de las obras, de que se ponen algunos exemplares. - Madrid : por la viuda de Juan Garcia Infancon, vendese en casa de Francisco Laso, 1724. - [30], 498, [18] p. : front., [4] woodcuts, 13 lam.
– Bd. 2, vol. 3: El parnaso español pintoresco laureado. Tomo Tercero. Con las vidas de los pintores, y estatuarions eminentes españoles, que con sus heroycas obras han ilustrado la nacion: y de aquellos estrangeros ilustres, que hand concurrido en estas provincias, y las hadn enriquecido con sus emeinets obras; graduados segun la serie de el tiempo, en que cade uno floreciò: para eternizar la memoria, que tan justamente se vincularon en la posteridad tan sublimes, y remontados espiritus.
NOT SEEN
In: BNP; BNM; *Figueras Ferrer 1992*: 1062; NSUG (vol. 1, missing); ULC.

230.2

El museo pictórico y la escala óptica / por Antonio Palomino de Castro y Velasco. - [2nd ed.]. - Madrid : en la Imprenta de Sancha, 1795–1797. - 3 vol. in 2 bd. : ill. ; 30–31 cm.
With literature
§ The text is identical to the edition Madrid 1715, 1724; see p. III.
The paging of the second binding containing volumes 2 and 3 is continuous.
– Bd. 1, vol. 1: El museo pictorico, y escala óptica. Teórica de la pintura, en que se describe su origen, esencia, especies y qualidades, con todos los demas accidentes que la enriquecen éilustran. Y su prueban con demonstraciones matematicas y filosoficas sus mas radicales fundamentos. Tomo primero / [front. scu. by Hipólito Rovira y Brocandel after Antonio Palomino, engravings by Juan Bernabé Palomino]. - Madrid, 1795. - XVI, 396 p. : front., 4 lam., folding.

Contents: p. IX.
Index on painting terms: p. 337.
Subject index: p. 361.
§ Title on frontispiece: Theorica de la pintvra
With a preface by the publisher.
Met een voorwoord van de uitgever.
The frontispiece is dated: 'Palomo. inv. Rovira sculp. Valentiae 1715'. The text engraved underneath the plate is cut off.
The *laminas* (engravings) are not signed, but probably made by Juan Bernabé Palomino, see the preface, p. III.
– Bd. 2, vol. 2: El museo pictorico, y escala óptica. Práctica de la pintura, en que se trata del modo de pintar á el olio, temple, y fresco, con la resolucion de todas las dudas que en su manipulacion pueden ocurrir. Y de la perspectiva comun, la de techos, ángulos, teatros, y monumentos de perspectiva, y otras cosas muy especiales, con la direccion y documentos para las ideas ó asuntos de las obras de que se ponen algunos exemplares. Tomo segundo / [front. for vol. 2 and 3 by Juan Bernabé Palomino after Antonio Palomino ; engr. by Juan Bernabé Palomino]. - Madrid, 1797. - [2], VIII p., p. 1–344 : front., [4] woodcuts, 13 lam. folding.
Contents: p. V.
MIP: pp. 331–333 : [1] woodcut.
§ Title on frontispiece: Practica de la pintvra. Mvseo pictorico
The frontispiece is dated: 'Reg. pict. Antonius Palomino inv. et delin. an 1723'.
The woodcuts are printed within the text, the *laminas* (engravings) are bound after p. 756.
– Bd. 2, vol. 3: El parnaso español pintoresco laureado. Con las vidas de los pintores, y estatuarios eminentes españoles. Que con sus heroycas obras han ilustrado la nacion: y de aquellos extrangeros ilustres que han concurrido en estas provincias, y las han enriquecido con sus eminentes obras; graduados segun la serie del tiempo en que cada uno floreció: para eternizar la memoria que tan justamente se vincularon en la posteridad tan sublimes y remontados espíritus. Tomo tercero. - Madrid, 1796. - P. 345–755, [1] p.
Subject index on vol. 2 and 3: p. 735.
Index on allegorical figures in vol. 2 and 3: p. 745.
Index on artists in vol. 3: pp. 748, 752.
Addenda & corrigenda: p. [1].
1 –
Line Etching
2 –
Copper
4 –
Painting
5 –
Art History
In: BNP; BNM; NCC; RMA; UBH.

230.3
An account of the lives and works of the most eminent Spanish painters, sculptors and architects / [Antonio Palomino de Castro y Velasco] ; transl. from the Musaeum Pictorium of Palomino Velasco [by Uvedale Price]. - London : printed for Sam. Harding, 1744. - viii, 175 p. ; 16 cm.
NOT SEEN
In: BL; BLO; KVK; V&A.

230.4
Histoire abregée des plus fameux peintres, sculpteurs et architectes espagnols : avec une description exacte de leurs oeuvres, & de celles des etrangers qui se voyent dans le même royaume / traduit de l'espagnol de Don Antonio Palamino Velasco. - Paris : Delaguette [printer], 1749. - [4], 389, [3] p. ; 8º.
NOT SEEN
In: BL; KVK.

230.5
El museo pictórico y la escala óptica / Antonio Palomino de Castro y Velasco. - Buenos Aires : Poseidon, 1944. - XXII, 395, XXXIV p. : [6?] ill. & XIX, 411, XXXV p. : 4 p. of ill. ; 27 cm.
NOT SEEN
In: BNM; KVK.

230.6
El museo pictórico y escala óptica / Antonio Palomino de Castro y Velasco ; prólogo de Juan A[gustín] Ceán y Bermúdez ; nota importante del ed. - [Repr.]. - Madrid : Aguilar, 1947. - XXXVI, 1222 p. : front., [23] reprod. ; 18–18.5 cm.
Contents: p. XVII.
MIP: pp. 748–750, [1] reprod.
Glossary: p. 1143.
Index on painting terms: p. 1165.
Index on allegorical figures: p. 1209.
Index on artists: pp. 1214, 1219.
§ Reprint of: Madrid 1715–1724 [No. 230.1].
The text has been reset and the spelling adapted. The illustrations are reproduced.
In: BNM; NCC; UBU (2×).

230.7
El museo pictórico y escala óptica / Antonio Palomino de Castro y Velasco ; prólogo de Juan A[gustín] Ceán y Bermúdez ; nota importante del ed. - [Repr.]. - Madrid : Aguilar, 1988. - 3 vol. : ill. ; 18 cm.
§ Includes bibliographical references and indices.
Perhaps a reprint of: Madrid 1715–1724 [No. 230.1].
– Vol. 1: 735 p. : ill.
ISBN 84-03-88003-0 (vol. 1)

– Vol. 2: 648 p. : ill.
ISBN 84-03-88004-9 (vol. 2)
– Vol. 3: 598 p. : ill.
ISBN 84-03-88005-7 (vol. 3)
NOT SEEN
In: KVK; *Figueras Ferrer 1992*: 1062.

Partington (Charles Frederick)   231.1

The mechanic's gallery of science and art : comprehending a series of distinct treatises in every department of the mechanical arts, expressly adapted to the use of operative artists' manufacturers, &c. ... [etc.] / Charles Frederick Partington. - London : printed for Sherwood, Gilbert & Piper, [c. 1825]. - [4], ii, 592, [4] p., [xi] p. : ill. ; 22 cm.
– Vol. 1: Volume 1 : containing clock & watchmaking, coach-making, printing, engraving, architecture, masonry, carpentry, plumbery, &c ... [etc.].
MIP: The engravers' complete guide : comprising the theory and practice of engraving, with its modern improvements, in steel plates, lithography, &c. &c. / C[harles] F[rederick] Partington, [Charles Heath?]. - P. 97–144 : ill. - (Book of trades ; 6).
§ Only vol. 1 was ever published.
'I suspect from the statistics of steel engraved production he quotes that someone close to Jacob Perkins, possibly Charles Heath, had a hand in writing the text for Partington, who was almost certainly not an engraver himself'; Basil Hunnisett, letter of 16 December 1995.
The same text on intaglio printmaking is used in The Mechanics' Library (see the following title description) and *The Franklin Journal*, see: **Partington** (1826) [No. 542]. Possibly a remainder of the present publication was used for The Mechanics' Library as even the paging is identical.
Partington (p. 112) is quoted, without reference, by **Fielding** (London 1841) [No. 100]: 32, concerning the ruling machine.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Lift-ground / Line Engraving Line Etching / Mezzotint / Relief Etching / Ruling Machine
2 –
Glass / Copper / Steel
3 –
Ink / Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Gem Cutting / Lithography / Stamping / Wood Engraving
5 –
Aesthetics / Art History
In: *Blas Benito 1994*: 70; *Bridson & Wakeman 1984*: no. A26; *Levis 1912*: 101; NUC–1956; OCLC; *Singer & Strang 1897*: no. 119.

231.2

The mechanics' library, or book of trades; comprehending series of distinct treatises, and practical guides, on the following subjects: architecture, carpentry, joinery, bricklaying, plastering, masonry, brickmaking, painting, glazing, plumbing, clock & watch-making, coachmaking, printing, engraving, and shipbuilding. Combining all the advantages of a large and expensive cyclopaedia, at a comparatively small cost / C[harles] F[rederick] Partington. - London : Sherwood, Gilbert, and Piper, [c. 1835?]. - 592, 144 p. : ill., XIV pl. ; 19.5–23 cm.
MIP: The engraver's complete guide. - P. 97–132 : [4] ill., pl. III.
With literature.
§ The date of publication is estimated.
The illustrations are wood engravings, the plates are etchings. The numbering of the plates is both in Arabic as well as in Roman numerals, although continuous.
Perhaps a remainder of the The Mechanic's Gallery with a new title page, see: London 1825 [No. 231.1].
In: LC; NUC–1956.

Paton (Hugh)   232.1

Etching, drypoint, mezzotint. The whole art of the painter-etcher. A practical treatise / by Hugh Paton ; [front. etched by Ernest Stamp] ; [pl. by Hugh Paton] ; [plans by F.W. Goolden]. - [1st ed.]. - London : Raithby, Lawrence ; Leicester : De Montfort Press, 1895 ; Paris : Porcabeuf (Maison Salmon) [plate printer]. - [2], viii, [2], 182, [4], viii p. : front., 10 pl., 5 plans ; 23.5 cm.
Contents: p. v.
List of illustrations: p. vii.
Suppliers: pp. 15, 108, 110, 146, 164, 171.
Rocking mezzotint plates: p. 92.
Plate printers: p. 177, 178.
Index: p. i at the back.
With literature.
§ Originally published as a series of articles in the *British Lithographer*, see: **Paton** (1892–1894) [No. 543]. Paton: p. iv: 'Since the paper orginally appeared, the whole of the text has been revised and largely added to, and all the plates re-executed.'
The preface is dated: 'Manchester, November, 1895'.
The frontispiece is dated: '1893'.
The plates are etchings that show the different techniques, the plans are diagrams of tools, press and studio (opp. p. 180).
Intended audience, p. I at the beginning: 'The following pages ... are not intended to appeal so much to the experienced etcher, although even such may find in them a hint or two, as to the beginner in the practice of the art of engraving upon copper with acid.'
1 –
Aquatint / Drypoint / Electrotype / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Steelfacing / Zinc
3 –
Ink / Press / Printing in Black
5 –
Art History / Monotype

In: BL; BLBS; *Bridson & Wakeman 1984*: nos. B38, B39; *Levis 1912*: 109, 129, 189; NUC–1956; OCLC (8×); RAL; *Singer & Strang 1897*: no. 398.

232.2

Etching, drypoint, mezzotint. The whole art of the painter-etcher. A practical treatise / by Hugh Paton ; [front. etched by Ernest Stamp] ; [pl. by Hugh Paton] ; [plans by F.W. Goolden]. - Second ed., with an added chapter on colour etching. - London : Raithby : Lawrence ; Leicester : De Montfort Press, 1909. - [2], xii, [2], 206, [2], viii p. : front., 13 pl., of which [2] in colour, 5 plans ; 23–24 cm.

Contents: p. ix.
List of illustrations: p. xi.
Suppliers: pp. 15, 108, 110, 146, 164, 171.
Rocking mezzotint plates: p. 92.
Plate printers: p. 177, 178.
Index: p. i at the back.
With literature.
§ Preface dated, p. viii: 'Manchester, October, 1909'.
Pp. 1–182 are identical to the 1895 edition with an additional chapter on colour printing (pp. 183–205). The index is identical to the 1895 edition and the part on colour printing is not indexed; see p. i at the beginning.
Audience, p. ii: 'This book is in use as a text-book in Schools of Art, and in the hands of many etchers.'
1 –
Aquatint / Drypoint / Electrotype / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Steelfacing / Zinc
3 –
Ink / Paper / Press / Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Monochrome / Printing Polychrome
5 –
Art History / Monotype
In: BL; *Bridson & Wakeman 1984*: no. B39; CCB; *Levis 1912*: 109, 129, 189; NUC–1956; OCLC (8×); Priv.Coll.; UBL-KHI.

232.3

Colour etching : a practical treatise / by Hugh Paton. - London : Simpkin, Marshall, Hamilton, Kent, 1909. - ii, 23 p. : [2] etch. ; 23–24 cm.

Literature: p. i.
§ The new preface by the author is dated, p. ii: 'Manchester, September, 1909'.
Separate edition of the chapter on colour printing of the edition: London 1909, see p. i.
The two etchings are specimens of *à la poupée* printing.
1 –
Aquatint
2 –
Copper
3 –
Ink / Multiple-plate Printing / Paper / Printing à la Poupée / Printing Polychrome
In: BL; BLBS; *Bridson & Wakeman 1984*: nos. B86; CCB; GLVA, 903; IBK 1978, 8 (1909): no. 2964; *Levis 1912*: 109, 129, 189; NUC–1956; OCLC (6×); TUD; ULC.

Pattemore (Arnel)   233.1

Printmaking activities for the classroom / Arnel W. Pattemore ; foreword by Charles D. Gaitskell. - Worcester, Mass. : Davis ; [S.l.], Canada : Moyer Division, Vilas Industries, cop. 1966. - 110 p. : front., [253] ill., of which [39] in colour ; 19.5 × 28.5 cm.

Contents: p. 5.
MIP: p. 63.
Glossary: p. 108.
Literature: p. 109.
Index: p. 110.
§ The illustrations are diagrams, photographs and reproductions.
Intended audience, p. 8: 'This book attempts to outline a number of techniques which will be found useful in the elementary school classroom.'
1 –
Line Engraving
2 –
Linoleum
3 –
Ink / Paper / Printing in Black / Rubbing
4 –
Gypsum Cut / Linoleum Cut / Monotype / Nature Printing / Relief Printing / Screen Printing
5 –
Art History / Conservation and Restoration
In: Priv.Coll.

233.2

Printmaking activities for the classroom / Arnel W. Pattemore ; foreword by Charles D. Gaitskell. - [2nd rev. ed.]. - Worcester, Mass : Davis Publications, [1969]. - 118 p. : ill. ; 20 × 29 cm.

Literature: p. 117.
NOT SEEN
In: KVK.

Perrot (Aristide-Michel)   234.1

Manuel du graveur, ou traité complet de l'art de la gravure en tous genres / d'apres les renseignemens fournis par plusieurs artistes ; rédigé par

A[ristide] M[ichel] Perrot; Felix Dien, [Joseph] [Théodore] Richomme, Amb[roise] Tardieu père sculpsit. - [1st ed.]. - Paris : à la librairie encyclopédique de Roret, 1830. - [4], 255 p. : [1] folding tab., [4] folding pl. ; 15 cm. - (Encyclopédie Roret).

Contents: p. 6.
List of engravers: p. 206.
Literature: p. 235.
With literature references.
Index & glossary, p. 237.
§ Title means: Manual of the engraver, or complete treatise about the art of engraving in all genres
The text is not so much a manual on etching and engraving as a compilation from works by large number of authors, as explained in the title, many of which are referred to. With every new edition more references are added. This makes every edition a reference work about the state of the art of engraving and etching in its period, for which reason a separate list of keywords is given with every later edition.
Photomechanical reprint: Egrève 2007 [No. 234.8].
1 –
Aquatint / Crayon Engraving / Drypoint / Electrical Engraving / Electrotype / Line Engraving / Line Etching / Mezzotint / Stipple Engraving
2 –
Brass / Copper / Steel
3 –
Multiple-plate Printing / Printing Polychrome
4 –
Line Block / Woodcut
5 –
Aesthetics / Art History
In: *Blas Benito 1994*: 70; BN; NUC–1956; OCLC; Priv.Coll.; *Singer & Strang 1897*: no. 130.

234.2

Nouveau manuel complet du graveur, ou traité de l'art de la gravure en tout genre / d'après les renseignements fournis par plusieurs artistes ; et rédigé par A[ristide] M[ichel] Perrot ; Felix Dien, [Joseph] [Théodore] Richomme, Amb[roise] Tardieu père sculpsit. - Nouvelle [2nd] éd., très-augm. / par F[rançois] Malepeyre. - Paris : à la librairie encyclopédique de Roret, 1844. - X, 289 p. : [1] folding tab., 4 folding pl. ; 15–16 cm. - (Encyclopédie Roret).

Contents: p. X.
List of engravers: p. 240.
Literature: p. 269.
Index and glossary: p. 271.
With literature.
§ The contents has no paging.
1 –
Aquatint / Crayon Engraving / Drypoint / Electrical Engraving / Electrotype / Line Engraving / Line Etching / Mezzotint / Ruling Machine / Soft-ground / Stipple Engraving
2 –
Brass / Bronze / Copper / Steel / Zinc
3 –
Multiple-plate Printing / Printing Polychrome
4 –
Line Block / Woodcut
5 –
Aesthetics / Art History
In: BL; *Blas Benito 1994*: 70; BLBS; CCB; ENS; KUB; KVB; MET; NCC; NUC–1956; RMA; *Singer & Strang 1897*: no. 187; UBA.

234.3

Nouveau manuel complet du graveur, ou traité de l'art de la gravure en tout genre / d'après les renseignements fournis par plusieurs artistes ; et rédigé par A[ristide] M[ichel] Perrot. - Nouvelle [3rd] éd. / mise au courant de la science et augm. de tous les nouveaux procédés mécaniques et chimiques relatifs a la gravure par M.-F. Malepeyre. - Paris : à la librairie encyclopédique de Roret, 1865. - VIII, 348 p. : 15 cm. - (Manuels Roret).
§ **Villon** (Paris 1894) [No. 349] probably derived a number of articles from this edition.
Photomechanical reprints: Paris 1978 [No. 234.5]; Paris 1984 [No. 234.6]; Paris 1988 [No. 234.7].
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Ruling Machine / Stipple Engraving / Soft-ground
2 –
Brass / Bronze / Copper / Glass / Copper / Steel / Steelfacing / Zinc
3 –
Multiple-plate Printing / Printing Polychrome
4 –
Chiaroscuro Woodcut / Line Block / Relief Etching / Woodcut / Wood Engraving
5 –
Art History
NOT SEEN
In: BN; *Figueras Ferrer 1992*: 1063; NUC–1956; *Singer & Strang 1897*: no. 238.

234.4

Lehrbuch der Kupferstecherkunst, der Kunst in Stahl zu stechen und in Holz zu schneiden (Chalcographie, Siderograhpie und Xylographie) oder theoretisch-praktische Anweisung zur Verfertigung von allen Arten von Kupferstichen in allen Manieren, zum Stahlstich, zum Zeichnen, Radiren und Stechen auf Zink, so wie zum chemischen Abdruck solcher Platten, und zur Holzschneidekunst nach der ältern und neuern Methode / frei nach dem französischen bearbeittet von Theodor Thon. - Ilmenau : Bernh. Fr. Voigt, 1831. - [2], XVIII, 377, [3] p. : VIII Tab. ; 19–20 cm. - (Neuer Schauplatz der Künste und Handwerke mit Berücksichtigung der neuesten Erfindungen ; 54).

List of titles in the series: p. [1] at the beginning.
Literature: p. VI.
Contents: p. X.
List of illustrations: p. 368.
Addenda & corrigenda: p. [1] at the back.
Stocklist: p. [2] at the back.
With literature.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Échoppe / Line Engraving / Line Etching / Mezzotint / Ruling Machine / Stipple Engraving
2 –
Copper / Steel / Zinc
3 –
Counterproof / Ink / Paper / Press / Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Lithography / Woodcut / Wood Engraving
5 –
Aesthetics / Art History / Collecting
In: BL; *Blas Benito 1994*: 67; BLBS; CCB; DBSM; KSM; NUC–1956; OBA; OCLC; RMA; *Singer & Strang 1897*: no. 133.

234.5

Nouveau manuel complet du graveur, ou traité de l'art de la gravure en tout genre / d'après les renseingements fournis par plusieurs artistes ; et réd. par A[ristide]-M[ichel] Perrot. - [Repr.]. - Paris : Laget, 1978. - VIII, 348 p. : ill. ; 18 cm.
ISBN 2-85204-040-9
§ Photomechanical reprint of: Paris 1865 [No. 234.3].
NOT SEEN
In: KVK; Priv.Coll.

234.6

Nouveau manuel complet du graveur ou traité de l'art de la gravure en tout genre / d'après les renseignements fournis par plusieurs artistes ; [rédigé] par A[ristide]-M[ichel] Perrot ; nouvelle éd. mise au courant de la science et augm. de tous les nouveaux procédés mécaniques et chimiques relatifs a la gravure pas F. Malepeyre ; Felix Dien, [Joseph] [Théodore] Richomme, Amb[roise] Tardieu père sculpsit. - Repr. - Paris : Inter-Livres, [printed 1984]. - VIII, 348 p. : [1] tab. ; 17.5 cm. + 4 pl. - (Encyclopédie Roret).
Contents: p. 346.
ISBN 2-905388-01-3 (hardcover)
§ Title on cover: L'art de la gravure
Photomechanical reprint of: Paris 1865 [No. 234.3].
Printer: Publiphotoffset.
Date of printing, p. 348: 'en Novembre 1984'.
In: *Blas Benito 1994*: 70; Priv.Coll. (4×).

234.7

Nouveau manuel complet du graveur ou traité de l'art de la gravure en tout genre / d'après les renseignements fournis par plusieurs artistes ; [rédigé] par A[ristide]-M[ichel] Perrot ; nouvelle éd. mise au courant de la science et augm. de tous les nouveaux procédés mécaniques et chimiques relatifs a la gravure pas F[rançois] Malepeyre. - Rééd. - Paris : Inter-Livres, [1988]. - 188, [1] p. : [1] tab. ; 24 cm. - (Manuels-Roret).
Contents: p. 187.
ISBN 2-905388-01-3 (softcover)
§ Reprint of: Paris 1865 [No. 234.3]. The text has been reset without the illustrations.
Date, p. [1]: 'Dépôt légal, fevrier 1988'.
Serial title on cover: Encylopédie Roret
The references to page numbers in the contents are partly incorrect because the text was reset without amending the contents.
In: Priv.Coll. (3×).

234.8

Manuel du graveur : ou traité complet de l'art de la gravure en tous genres / Aristide-Michel Perrot. - [Reproduction en fac-similé]. - Saint-Égrève : Emotion Primitive, 2007. - 255 p. ; 20 cm.
ISBN 2-354-22100-2
ISBN 978-2-354-22100-3
§ Photomechanical reprint of: Paris 1830 [No. 234.1].
NOT SEEN
In: DBSM.

Peterdi 1 (Gabor)   235

The basic procedures of etching : some notes on the basic procedures of etching and printing intaglio from a metal plate / as prepared by Gabor Peterdi. - [New Haven] : [Yale University], [1958]. - 47, [1] p. : [14] ill. ; 26 cm.
Contents: p. 5.
Edition: 250 copies.
§ Dates, p. 2: 'Copyrighted by Gabor Peterdi, 1957'; p. [1]: 'designed ... June 1955 printed ... 1958'.
Probably meant for internal use only.
All illustrations are silhouettes printed in red-brown.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Soft-ground
2 –
Copper / Zinc
3 –

Ink / Paper / Press / Printing in Black
5 –
Conservation and Restoration / Health and Safety
In: OCLC (3×); Priv.Coll.

Peterdi 2 (Gabor)   236.1

Printmaking : methods old and new / by Gabor Peterdi ; [preface by Una E. Johnson]. - First printing. - New York : Macmillan, 1959. - xxviii, 303 p. : [221] ill., of which [3] in colour ; 26 cm.
Contents: p. xi.
List of illustrations: p. xv.
Glossary: p. xxiv.
MIP: pp. 1–221 : [158] ill., of which [2] in colour.
Literature: p. 295.
Suppliers: p. 296.
Index: p. 299.
§ The preface is dated, p. x: 'The Brooklyn Museum October, 1958'.
The illustrations are diagrams, photographs and reproductions. The illustrations are numbered per chapter.
1 –
Aquatint / Collagraph / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Stipple Engraving / Soft-ground
2 –
Aluminium / Copper / Iron / Magnesium / Plastic / Steel / Steelfacing / Zinc
3 –
Casting / Ink / Leather / Multiple-plate Printing / Paper / Press / Printing in Black / Printing Polychrome / Textile
4 –
Screen Printing / Wood Engraving / Woodcut
5 –
Art History / Conservation and Restoration / Health and Safety
In: BL; *Blas Benito 1994*: 85; BLBS; BNL (2×); CCB; *Figueras Ferrer 1992*: 1063; KBR; NCC; OCLC; Priv.Coll.; RKD; SBB; UBG; UBL-KHI.

236.2

Printmaking : methods old and new / by Gabor Peterdi ; [preface by Una E. Johnson]. - Second printing. - New York : [Macmillan], 1961. - xxviii, 303 p. : [221] ill., of which [3] in colour ; 26 cm.
Contents: p. xi.
List of illustrations: p. xv.
Glossary: p. xxiv.
MIP: pp. 1–221 : [158] ill., of which [2] in colour.
Literature: p. 295.
Suppliers: p. 296.
Index: p. 299.
§ Identical to: New York 1959 [No. 236.1].
In: Priv.Coll.

236.3

Printmaking : methods old and new / by Gabor Peterdi ; [preface by Una E. Johnson]. - Third printing. - New York : Macmillan, 1964. - xxviii, 303 p. : [221] ill., of which [3] in colour ; 26 cm.
§ Identical to: New York 1959 [No. 236.1].
In: RAL.

236.4

Printmaking : methods old and new / by Gabor Peterdi ; [preface by Una E. Johnson]. - Fourth printing. - New York : Macmillan, 1965. - xxviii, 303 p. : [221] ill., of which [3] in colour ; 26 cm.
Contents: p. xi.
List of illustrations: p. xv.
Glossary: p. xxiv.
MIP: pp. 1–221 : [158] ill., of which [2] in colour.
Literature: p. 295.
Suppliers: p. 296.
Index: p. 299.
§ Identical to: New York 1959 [No. 236.1].
In: RCE.

236.5

Printmaking : methods old and new / by Gabor Peterdi ; [preface by Una E. Johnson]. - Fifth printing. - New York : Macmillan, [c. 1996].
NOT SEEN

236.6

Printmaking : methods old and new / by Gabor Peterdi ; [preface by Una E. Johnson]. - Sixth printing. - New York : Macmillan, [c. 1996].
NOT SEEN

236.7

Printmaking : methods old and new / by Gabor Peterdi ; [preface by Una E. Johnson]. - Seventh printing. - New York: Macmillan, 1968. - xxviii, 303 p. : [221] ill., of which [3] in colour ; 26.5 cm.
Contents: p. xi.
List of illustrations: p. xv.
Glossary: p. xxiv.
MIP: pp. 1–221 : [158] ill., of which [2] in colour.

Literature: p. 295.
Suppliers: p. 296.
Index: p. 299.
§ Identical to: New York 1959 [No. 236.1].
In: Priv.Coll.

Printmaking : methods old and new / by Gabor Peterdi ; [preface by Una E. Johnson]. - Rev. ed. [first printing]. - New York : Macmillan ; London : Collier Macmillan, 1971. - xxxix, 342 p. : ill., 4 colour pl. ; 27 cm.
§ For a more detailed title description see the edition: New York 1973 [No. 236.10].
According to the edition New York 1980, p. xxi: '*Printmaking* was published in 1959 and revised in 1969.'
NOT SEEN
In: BL; *Blas Benito 1994*: 85; OCLC; ULC.

Printmaking : methods old and new / by Gabor Peterdi ; [preface by Una E. Johnson]. - Rev. ed. [second printing]. - New York : Macmillan ; London : Collier Macmillan, 1972 [?].
§ Perhaps a 'ghost'.
NOT SEEN

Printmaking : methods old and new / Gabor Peterdi ; [preface by Una E. Johnson]. - Rev. ed., third printing. - New York : Macmillan ; London : Collier Macmillan, 1973. - xxxix, [3], 342 p. : front., [227] ill., of which [4] in colour ; 26 cm.
Contents: p. ix.
List of illustrations: p. xv.
Glossary: p. xxix.
MIP: pp. 1–255 : [167] ill., of which [4] in colour.
Literature: p. 330.
Suppliers: p. 332.
Index: p. 337.
§ The preface by Una Johnson is the same as in: New York 1959 [236.1].
The introduction to the revised edition is dated, p. xxiii: '1970'.
Some black and white reproductions and all colour reproductions are replaced and many new reproductions are added. Two photographs are replaced by three others. All diagrams are the same.
1 –
Aquatint / Collagraph / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Relief Etching / Soft-ground / Stipple Engraving
2 –
Aluminium / Copper / Iron / Magnesium / Plastic / Steel / Steelfacing / Zinc
3 –
Casting / Ink / Jigsaw Print / Leather / Multiple-plate Printing / Printing Polychrome / Paper / Press / Printing in Black / Textile
4 –
Screen Printing / Woodcut / Wood Engraving
5 –
Art History / Conservation and Restoration / Health and Safety / Original and Reproduction
In: Priv.Coll.

Printmaking : methods old and new / Gabor Peterdi ; [preface by Una E. Johnson]. - Rev. and exp. ed. - New York : Macmillan ; London : Collier Macmillan, cop. 1980. - xxxvii, [3], 384 p. : front., [227] ill., of which [4] in colour ; 26.5 cm.
Contents: p. viii.
List of illustrations: p. xiii.
Glossary: p. xxvii.
MIP: pp. 1–255 : [168] ill., of which [4] in colour.
Tables of chemicals in printmaking: pp. 339–344, 346–353, 358–361, 364–370
Literature: p. 371.
Types of paper: p. 373.
Suppliers: p. 375.
Index: p. 379.
ISBN 0-02-596060-1 (hardcover)
§ The preface by Una Johnson is the same as in: New York 1959 [236.1].
P. xxi: '*Printmaking* was published in 1959 and revised in 1969; this is its second revision.'
The text about intaglio printmaking is identical except that a paragraph about viscosity colour printing on p. 226 is replaced by the new chapter 13 about other techniques for intaglio colour printing. The illustrations are the same, except that nos. VI, 46 and VIII, 21 are replaced by reproductions of other prints by the same printmaker. The former chapter 10 about 'Printing methods for young children' is omitted. Chapter 11, 'Mounting prints', is extended with some paragraphs, as is chapter 12 about the studio. Chapter 14, which is new, discusses 'Health and safety in printmaking', with tables of chemicals used in printmaking and their toxicity. This chapter is based on (p. 333) 'excerpts of a study on chemicals and materials commonly used by artists, published by the Occupational Hygiene Branch, Alberta Labour, Edmonton, Alberta'.
1 –
Aquatint / Collagraph / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Relief Etching / Soft-ground / Stipple Engraving
2 –
Aluminium / Copper / Iron / Plastic / Magnesium / Steel / Steelfacing / Zinc
3 –
Casting / Chine Collé / Jigsaw Print / Hand-colouring / Ink / Leather / Multiple-plate Printing / Paper / Press / Printing in Black / Printing Polychrome

/ Textile
4 –
Monotype / Screen Printing / Woodcut / Wood Engraving
5 –
Art History / Conservation and Restoration / Health and Safety
In: BL; *Blas Benito 1994*: 85; BNM; DBI-VK; OCLC; Priv.Coll.; UBH; ULC.

Petrie (Kevin)   237.1

Glass and print / Kevin Petrie. - London : A&C Black, 2006. - 128 p. : ill., mainly in colour ; 24 cm. - (Glass handbooks).
Literature: p. 127.
Index
ISBN 0-7136-6491-6 (paperback)
ISBN 978-0-7136-6491-1 (paperback)
§ Contains some information concerning offsetting a print on glass and etching glass.
1 –
Line Etching
2 –
Glass
NOT SEEN
In: BL.

237.2

Glass and print / Kevin Petrie. - Philadelphia : University of Pennsylvania Press, 2006. - 128 p. : ill., mainly in colour ; 24cm.
Literature: p. 127.
Index
ISBN 0-81221946-5 (paperback)
ISBN 978-0-81221946-3 (paperback)
NOT SEEN
In: LC.

Petterson (Melvyn) & **Gale** (Colin) 238

The instant printmaker : printing methods to try at home and in the studio / Melvyn Petterson and Colin Gale. - London : Collins & Brown, 2003. - 128 p. : [355] ill. ; 28.5 cm.
Contents: p. 4.
MIP: pp. 8–17, 42–44, 68–107, 122–123.
Index: p. 126.
Suppliers: p. 128.
ISBN 1-84340-009-X (hardcover)
§ The illustrations are diagrams, photographs and reproductions.
Review: J. Newell, in *Printmaking Today*, 13 (2004) 3: 30.
1 –
Aquatint / Collagraph / Drypoint / Line Etching / Soft-ground
2 –
Aluminium / Cardboard / Plastic
3 –
Casting / Ink / Paper / Press / Printing in Black
4 –
Linoleum Cut / Lithography / Monotype / Screen Printing / Stamping / Woodcut / Wood Engraving
5 –
Conservation and Restoration / Health and Safety
In: Priv.Coll.

Piel (Nancy)   239

Kaltnadelradierung : Entwurfen, Drucken, Kolorieren / Nancy Piel ; Fotos Frank Schuppelius. - Wiesbaden : Englisch Verlag, 1998. - 63, [1] p. : [76] colour ill. ; 23 cm.
Stocklist: p. [1].
ISBN 3-8241-0857-7 (softcover)
§ Title means: Drypoint: designing, printing, colouring
The illustrations are diagrams, photographs and reproductions.
Intended audience, backside cover: 'Anfänger' and 'Fortgeschrittene'.
1 –
Drypoint
2 –
Aluminium / Copper / Plastic / Steelfacing / Zinc
3 –
Hand-colouring / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Troubleshooting
5 –
Aesthetics / Conservation and Restoration
In: DNB-F; Priv.Coll.

Piemontese (Alessio)
See: **Alessio Piemontese** [No. 007].

Metalligrafiikka / Tuulikki Pietilä ; julkaisutyöryhmä, Pentti Kaskipuro, Markku Lahti, Anne Valkonen, Olli Valkonen. - Jyväskylä : Luova Grafiikka ;
[S.l.] : [Gummerus], [1978]. - 159 p. : [68] ill., of which [4] in colour ; 17 × 21.5 cm.
Glossary: p. 132.
Index: p. 139.
List of illustrations: p. 146.
Contents: p. 149.
Literature: p. 159.
ISBN 951-95481-0-6 (hardcover)
§ Title means: Printmaking from metal plates or, Intaglio printmaking
The illustrations are diagrams, photographs and reproductions.
The glossary has French and English translations of the defined terms.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Soft-ground
2 –
Brass / Copper / Steelfacing / Zinc
3 –
Casting / Ink / Paper / Press / Printing in Black
4 –
Monotype
5 –
Conservation and Restoration
In: HELKA (5×); OCLC.

Técnicas del grabado calcográfico y su estampación. Con unas notas sobre bibliofilia / Jaime Pla ; fotografías de Emilio Godes. - [1st ed.]. - Barcelona
: Gili, 1956. - 182 p. : front., [31] diagrams, XXXVIII lám. ; 22.5 cm.
Specimens: frontispiece.
List of plates: p. 179.
Contents: p. 181.
With literature.
§ Title means: Techniques of chalcographic engraving and its printing. With some notes on bibliophily
The frontispiece shows examples of various intaglio printmaking techniques.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Brass / Copper / Steelfacing / Zinc
3 –
Ink / Paper / Printing à la Poupée / Printing in Black / Printing Monochrome / Printing Polychrome
4 –
Relief Printing
5 –
Aesthetics / Art History / Health and Safety
In: BNM; *Blas Benito 1994*: 85; Priv.Coll.

241.2

Técnicas del grabado calcográfico y su estampación. Con unas notas sobre bibliofilia / Jaime Pla ; fotografías de Emilio Godes, [cover photogr. by] F.
Català Roca. - Segunda ed. - Barcelona : Blume, 1977. - [6] p., p. IX– XIX, [1] p., p. 13–176, [40] p., p. 177–182 : 55 diagrams, [1], XXXVIII lám. ; 21.5–
22 cm. - (Diseño y artes graficas).
List of plates: p. 179.
Contents: p. 181.
List of titles in the series: back flap
§ The plates are bound between pp. 176 and 177.
In: *Blas Benito 1994*: 85; BNM.

241.3

Técnicas del grabado calcográfico y su estampación. Con unas notas sobre bibliofilia / Jaime Pla ; fotografías de Emilio Godes. - [3rd ed.]. - Barcelona
: Omega, 1986. - 181 p. : ill., XXXVIII pl. ; 21 cm.
NOT SEEN
In: *Blas Benito 1994*: 85; BNM; OCLC.

Etching and other graphic arts : an illustrated treatise / by George T[aylor] Plowman. - [1st ed.]. - London : Lane, The Bodley Head ; New York : Lane
; Toronto : Bell & Cockburn, 1914. - 154 p. : front., 2 pl., 24 reprod. ; 21 cm.
Contents: p. 13.
List of illustrations: p. 15.
MIP: pp. 71–154.
Suppliers and plate printers: p. 143.

Literature: p. 147.
Index: p. 151.
With literature.
§ Dating on verso of title page: 'Copyright, 1914, By John Lane Company'.
The frontispiece is an etching: *In Rome*, by George T[aylor] Plowman.
The two plates contain diagrams.
The various publishers seem to have used their own bookcovers. The Bodley Head's issue has a plain brown cover, 'THE BODLEY HEAD' printed in gold at the bottom of the spine, and the front cover printed in black. The Lane's issue has a black cover, 'JOHN LANE COMPANY' printed in gold at the bottom of the spine, and the front cover printed with gold 'handwriting' and a white line reproduction of a French cathedral.
Review: A.B., in *The Burlington Magazine*, 29 (1916) 162 (Sept.): 261–262.
Review: *The Connoisseur*, 43 (1915): 245–246.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Zinc
3 –
Ink / Paper / Press / Printing in Black
5 –
Art History
In: *Blas Benito 1994*: 85; IBK 1978, 14 (1915–1916): no. 3182; MET; NUC–1956; OCLC Priv.Coll (2×).

242.2
Etching and other graphic arts : an illustrated treatise / by George T[aylor] Plowman. - [1st ed.] Ed. de luxe. - London : Lane, The Bodley Head ; New York : Lane ; Toronto : Bell & Cockburn, 1914. - 154 p. : front., 2 pl., 24 reprod. ; 21 cm.
Contents: p. 13.
List of illustrations: p. 15.
MIP: pp. 71–154.
Suppliers and plate printers: p. 143.
Literature: p. 147.
Index: p. 151.
With literature.
Edition: 250 copies.
In: RAL; ULC.

242.3
Etching and other graphic arts : an illustrated treatise / by George T[aylor] Plowman. - [1st ed.]. - London : Lane, The Bodley Head ; New York : Lane, 1915. - 154 p. : front., 2 pl., 24 reprod. ; 21 cm.
Contents: p. 13.
List of illustrations: p. 15.
MIP: pp. 71–154.
Suppliers and plate printers: p. 143.
Literature: p. 147.
Index: p. 151.
With literature.
In: BL; BLBS; CCB; NCC; OCLC (24×); RMA; UBL-KHI.

242.4
Etching and other graphic arts : an illustrated treatise / by George T[aylor] Plowman. - Rev. and enl. [2nd] ed. - London : Lane, The Bodley Head, 1922. - 158 p. : front., 49 reprod., 2 pl. ; 23 cm.
Contents: p. 11.
List of illustrations: p. 13.
MIP: pp. 71–158.
Suppliers and plate printers: p. 145.
Literature: p. 149.
Index: p. 155.
With literature.
§ The preface to the second edition is dated, p. 6: 'Cambridge, Mass., 1922'.
The frontispiece is an etching: *Ruins of Rheims, 1919*, by George T[aylor] Plowman.
The text is identical to the 1914 edition, with a second preface, the addresses of supplier and the literature are changed. With some more and other reproductions.
In: BL; *Blas Benito 1994*: 85; BLBS; CCB; GBR; NCC; OCLC; Priv.Coll. (2×); SBH.

242.5
Etching and other graphic arts : an illustrated treatise / by George T[aylor] Plowman. - [2nd ed.]. - New York : Dodd Mead, 1922.
NOT SEEN
In: MET; NUC–1956; OCLC.

242.6
Etching and other graphic arts : an illustrated treatise / by George T[aylor] Plowman. - Rev. and enl. [3rd] ed. - New York : Dodd Mead, 1929. - 158 p. : front., 49 reprod., 2 pl. ; 23 cm.
Contents: p. 11.
List of illustrations: p. 13.
MIP: pp. 71–158.
Suppliers and plate printers: p. 145.
Literature: p. 149.

Index: p. 155.
With literature.
§ Identical to the 1922 edition.
The frontispiece is a new etching: *Cattaro (Kotor): Ancient Venetian house*, by George T. Plowman.
In: NUC–1956; OCLC; Priv.Coll.

Plowman 2 (George Taylor)   243.1

Manual of etching : a handbook for the beginner / George T[aylor] Plowman ; with illustrations by the author. - [1st ed.]. - London : Lane, The Bodley Head, 1924. - xiv, [2], 94 p. : front., [33] reprod., 2 pl. ; 21 cm.
Contents: p. xi.
List of illustrations: p. xiii.
List of materials: p. 88.
Literature: p. 89.
Suppliers, plate printers, steelfacers: p. 90.
§ The frontispiece is an etching, the plates are diagrams of tools.
P. VII: 'My purpose in this manual is to omit everything which is not absolutely necessary to the beginner in etching.'
1 –
Aquatint / Drypoint / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steelfacing / Zinc
3 –
Printing in Black / Paper / Press
4 –
Monotype
5 –
Conservation and Restoration
In: BL; BLBS; NUC–1956; OCLC; Priv.Coll.; ULC.

243.2

Manual of etching. : a handbook for the beginner / George T[aylor] Plowman ; with ill. by the author. - [1st ed.]. - New York : Dodd, Mead, 1924. - XIV, [2], 94 p. : ill. ; 21 cm.
NOT SEEN
In: OCLC.

243.3

Manual of etching : a handbook for the beginner / George T[aylor] Plowman ; with ill. by the author. - [2nd ed.]. - New York : Dodd, Mead, 1928. - xiv, [2], 94 p. : front., [33] reprod., 2 pl. ; 21 cm.
Contents: p. xi.
List of illustrations: p. xiii.
List of materials: p. 88.
Literature: p. 89.
Suppliers, plate printers, steelfacers: p. 90.
In: Priv.Coll.

243.4

Manual of etching : a handbook for the beginner / George T[aylor] Plowman ; with ill. by the author. - [3rd ed.]. - New York : Dodd, Mead, 1930. - xiv, [2], 94 p. : ill. ; 22 cm.
NOT SEEN
In: OCLC.

Poortenaar (Jan Christiaan)   244

NB: The text is the same throughout all editions, corrections have not been made.

244.1

Etskunst : techniek en geschiedenis / door Jan [Christiaan] Poortenaar ; met een voorwoord van H. Teding van Berkhout ; etsen [and diagrams] door den schrijver. - [1st ed.]. - Amsterdam : De Bussy, 1930. - XVI, 216, [112] p. : A t/m S [= 19] fig., [1] facsimile, 174 reprod., 6 etch., [1] pl. with specimens ; 29.5 cm.
Addenda & corrigenda: p. VI.
Contents: p. VII [sic! = p. VIII).
List of etchings: p. IX.
List of reproductions: p. IX.
Specimens: opp. p. XVI.
Suppliers: p. 58.
Gauze samples: p. 61.
Paper samples: p. 81.
Literature: p. 170.
Index: p. 209.
Reproductions nos. 1–31: in the text.
Reproductions nos. 32–174: p. [1].
Edition: 375 copies, numbered I–XXV and 1–350.
§ Title means: The art of etching: technique and history
Not every copy has the 'addenda & corrigenda'.
The *figuren* are one reproduction and eighteen diagrams. One etching is the frontispiece. Some of the etchings are printed monochrome in colour.
With either two or three gauze samples. The paper samples differ per edition.

Copies nos. I–XXV are bound in a full linen cover, printed on special paper and signed by the author.
1 –
Aquatint / Crayon Engraving / Drypoint / Échoppe / Lift-ground / Line Etching / Monotype / Soft-ground
2 –
Iron / Copper / Steelfacing / Zinc
3 –
Ink / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Aesthetics / Art History / Conservation and Restoration
In: CCB; GBR; KABK; KB; KBR; MBvB; MMW; NCC; NUC–1956; OBA; PBL; RAA; RKD; RMA; SBB; SPKA; TM; TUD; UBA; UBG (missing); UBH; UBL-KHI; UBN.

244.2
Etskunst : techniek en geschiedenis / door Jan [Christiaan] Poortenaar ; met een voorwoord van H. Teding van Berkhout ; etsen [and diagrams] door den schrijver. - [1st ed.]. - Amsterdam : De Bussy, 1930. - XVI, 216, [112] p. : A t/m S [= 19] fig., [1] facsimile, 174, [6] reprod., 6 etch., [1] pl. specimens ; 29.5 cm.
Contents: p. VII.
List of etchings: p. IX.
List of reproductions: p. IX.
Specimens: opp. p. XVI.
Suppliers: p. 58.
Gauze samples: p. 61.
Paper samples: p. 81.
Literature: p. 170.
Index: p. 209.
Reproductions nos. 1–31: in the text.
Reproductions nos. 32–174: p. [1].
§ Without the 'Addenda & corrigenda.'
Unnumbered copy, apparently a proof, p. IV: 'een proefdruk'.
The text is printed on thicker paper than the text of the trade edition, which makes the book more voluminous.
The author printed the etchings himself, as all are signed 'Jan Poortenaar af. et imp.'. Some of the etchings are printed monochrome in colour.
With one colour reproduction and five photogravures additionally pasted into the text.
In gold-stamped red-leather binding, the top edge of the bookblock is gilt.
In: Priv.Coll.

244.3
Etskunst : techniek en geschiedenis / door Jan [Christiaan] Poortenaar ; met een voorwoord van H. Teding van Berkhout ; etsen [and diagrams] door den schrijver. - [2nd ed.]. - Antwerpen : De Sikkel ; Amsterdam : Poortenaar, [1932]. - XVI, 216, [121] p. : A t/m S [= 19] fig., VIII, 174 reprod. ; 29 cm.
Contents: p. VII.
List of etchings: p. IX.
List of reproductions: p. IX.
Addenda & corrigenda: p. XVI.
Suppliers: p. 58.
Gauze samples: p. 61.
Paper samples: p. 81.
Literature: p. 175.
Index: p. 209.
Reproductions nos. 1–31: in the text.
Reproductions nos. 32–174: p. [1].
Advertisement: p. [115].
§ The specimens and etchings are replaced by their reproductions, numbered I–VIII and inserted in between pp. VIII and IX. Nos. IV, V and VI are bound dispersed through the text.
In: KABK; KUB; MMW; NCC; UBA; UBG.

244.4
Etskunst : techniek en geschiedenis / door Jan [Christiaan] Poortenaar ; met een voorwoord van H. Teding van Berkhout ; etsen [and diagrams] door den schrijver. - Derde druk. - Amsterdam : De Bussy, 1933. - XVI, 216, [112] p. : A t/m S [= 19] fig., [1] facsimile, 174 reprod., 6 etch., 1 pl.
Addenda & corrigenda: p. VI.
Contents: p. VII.
List of etchings: p. IX.
List of reproductions: p. IX.
Specimens: opp. p. XVI.
Suppliers: p. 58.
Gauze samples: p. 61.
Paper samples: p. 81.
Literature: p. 170.
Index: p. 209.
Reproductions nos. 1–31: in the text.
Reproductions nos. 32–174: p. [1].
Edition: 375 copies, numbered I–XXV and 1–350.
§ Some of the etchings are printed monochrome in colour.
In: BL; BLBS; CCB; MMW; Priv.Coll.; TUE.

Etskunst : techniek en geschiedenis / door Jan [Christiaan] Poortenaar ; met een voorwoord van H. Teding van Berkhout ; etsen [and diagrams] door den schrijver. - Vierde druk. - Naarden : In den toren, 1946. - XVI, 216 p. : 174 afb., A t/m S [= 19] fig., 6 etch. ; 29 cm.
Addenda & corrigenda: p. VI.
Contents: p. VII.
List of etchings: p. IX.
List of reproductions: p. IX.
Specimina: opp. p. XVI.
Suppliers: p. 58.
Gauze samples: p. 61.
Paper samples: p. 81.
Literature: p. 170.
Index: p. 209.
Reproductions nos. 1–31: in the text.
Reproductions nos. 32–174: p. [1].
Edition: 275 copies, numbered I–XXV and 1–250.
§ Some of the etchings are printed monochrome in colour.
In: ENS; MMR; MMW; MVvG; NCC; Priv.Coll.; TUT.

Fotogravure, en ny metode = Photopolymergravure / Eli Ponsaing ; tegninger Erik Leenders ; fotos Torgen Dragsby ; oversaettelse til engelsk Mogens Brinch. - Valby : Borgen, 1995. - 95 p. : ill. ; 25 cm.
ISBN 87-21-00396-3
§ Title means: Photogravure, a new method = Photopolymergravure
Review: R. Simmons, 'Photopolymer intaglio', in *Printmaking Today*, 5 (1996) 1: 22.
See also: **Eskola** & **Holopainen** (Helsinki 1996) [No. 094].
See also: **Ponsaing** (1995) [No. 554].
2 –
Photopolymer Plate
3 –
Printing in Black
NOT SEEN
In: KBK; LIBRIS.

Etching and drypoint / by Ernest Graham Porter. - London [etc.] : Pitman, 1933. - xii, 91, [17] p. : front., 43 pl. ; 19.5 cm. - (Pitman's 'craft-for-all' series).
Contents: p. ix.
List of illustrations: p. xi.
Stocklist: p. [2].
Titles in the series: p. iv, flaps of front- and backcover.
§ The plates are diagrams, photographs and reproductions.
1 –
Aquatint / Drypoint / Line Etching / Soft-ground
2 –
Copper / Zinc
3 –
Press / Printing in Black / Printing Monochrome
5 –
Art History / Conservation and Restoration
In: BL; BLBS; NUC–1956; OCLC (12×); Priv.Coll.

Lettre sur les éléments de la gravure à l'eau-forte / par A[dolphe Théodore Jules Martial] Potémont. - Paris : Cadart et Luquet, 1864. - [1], 1–4 etch. ; 50 cm.
§ Title means: Letter about the elements of etching
Letter by A. Potémont to Martial, the author to his pseudonym, in the form of a series of etchings.
Adolphe Potémont Martial is the pseudonym of Adolphe Théodore Jules Martial Potémont.
Text on four etchings (each 29.5 × 20 cm) in a folder. A fifth etching (20.5 × 16 cm) showing an envelope is printed as the title page on the front of the folder.
The etching on the cover is dated twice: 'Paris Juin 1864'. Etching no. 1 is dated: 'Paris - 1860'.
The etchings are printed by Beillet et Forestier.
Photomechanical reprint: Düsseldorf 1975.
1 –
Line Etching
2 –
Copper
3 –
Printing in Black
In: BL; *Blas Benito 1994*: 70; *Figueras Ferrer 1992*: 1063; NUC–1956; OCLC; RMA; *Singer & Strang 1897*: no. 237,

Lettre sur les éléments de la gravure à l'eau-forte / par A[dolphe-Théodore-Jules-Martial] Potémont. - [Photom. repr.]. - [Düsseldorf] : Boerner, [1975]. - Folder with 6 p. : [5] reprod. ; 29.5 cm.

§ These are the Seasonal Greetings for 1975/1976 of the antiquarian print dealer C.G. Boerner: 'Den Freunden von C.G. Boerner mit herzlichen Wünschen zum Jahreswechsel'.

Photomechanical reprint of: Paris 1860–1864.

In: MBvB; OCLC.

Potémont 2 (Adolphe-Théodore-Jules-Martial) 248.1

Nouveau traité de la gravure a l'eau-forte pour les peintres et les dessinateurs / A[dolphe]-P[otémont] Martial ; un mot sur l'eau-forte par W[illiam] Bürger ; un mot sur l'eau forte par Theophile Gautier ; [etch. by] A[dolphe]-P[otémont] Martial. - Paris : Cadart, 1873. - I–XXIII, [24]–59, [4] p. : 13 pl., [1] ill. ; 25 cm.

Supplier: p. 25.

Advertisement: p. [1].

Contents: p. [4].

§ Title means: New treatise on etching for painters and draughtsmen

Adolphe Potémont Martial is pseudonym of Adolphe Théodore Jules Martial Potémont.

William Bürger is pseudonym of the art critic Theophile Thoré.

The 13 *planches* are twelve etchings and one reproduction printed in relief. The illustration on p. [2] is printed from a line block.

1 –

Line Etching

2 –

Copper / Steelfacing

3 –

Printing in Black

In: ABK; BL (2×); *Bigmore & Wyman 1880–1886* 2: 28; *Blas Benito 1994*: 70; BLBS; BN; CCB; *Figueras Ferrer 1992*: 1057; MAK 1883, p. 291; MET; MVvG; NUC–1956; OCLC (15×); RAA; RKD; RMA; *Singer & Strang 1897*: no. 261; SPKA; UBA; UBU.

Nouveau manuel de la gravure a l'eau-forte pour les peintres et les dessinateurs / A[dolphe]-P[otémont] Martial ; [with contributions about soft-ground and drypoint by Philip Gilbert Hamerton] ; ill. by Marten van der Loo ... [et al.]. - 2nd ed. - Anvers : Maeyens, [1941?]. - 55, [1] p. : [26] pl., 6 ill. ; 22 cm.

Contents: p. [1].

Stocklist: p. [1].

§ No year of publication found, but contemporary to the Dutch-language edition of 1941.

The *planches* are reproductions. Pl. '1'-'13' are reproductions after the etchings in the first edition. Pl. [17], [18] and [21] are reproductions after etchings in **Lalanne** (Paris 1866) [No. 178].

1 –

Drypoint / Line Etching / Soft-ground

2 –

Copper

3 –

Press / Printing in Black

In: Priv.Coll.

Gids bij het etsen : vernis-mou en droge naald / door A[dolphe]-P[otémont] Martial ; [with contributions about soft-ground and drypoint by Philip Gilbert Hamerton]. - Antwerpen : Maeyens' uitgeverij voor teekenonderricht, [1941]. - 48 p. : 13, [6] pl., [6] ill. ; 22 cm. - (Kunsttechnische handleidingen).

Contents: p. 48.

Advertisement: inside backcover.

Titles in the series: backside cover.

§ Title means: Guide to etching: soft-ground and drypoint

Translation of the edition: Paris 1873.

NUC–1956: '[1941]'.

Pl. '1'-'13' are reproductions after the etchings in the first edition.

In: CCB; KABK; MMR; NCC; NUC–1956; Priv.Coll.; RAA; SPKA; UBG.

Praktisches Handbuch 249.1

Encyclopädie für Künstler. Vollständige Anleitung alle Arten Gold, Silber ... zu verfertigen ; Nebst einer praktischen Anweisung zur Oel-und Pastelmahlerei, zum Emailliren ... ; aus den vorzüglichsten Schriften verschiedener Sprachen gesammelt und zu einem allgemeinen Handbuch für Künstler, Chemiker, Fabrikanten und Oekonomen bestimmt. - Berlin : Pauli, 1794–1797. - 5 vol. ; 8º.

§ Title means: Encyclopaedia for artists (etc.)

NOT SEEN

In: KVK; LIBRIS.

Encyclopädie für Künstler. Vollständige Anleitung alle Arten Gold, Silber und andere Metallarbeiten zu verfertigen, Firnisse, Lack, Farben und andere zu den Künsten erforderliche chymische Producte zu bereiten; feine Arbeiten von Elfenbein, Schildpatt, Horn, Stroh, Leder, Holz und dergleichen zu verfertigen. Nebst einer praktischen Anweisung zur Oehl- und Pastelmahlerey, zum Emaillieren, Bronziren, Graviren und Lackiren, zur Vergoldung und Versilberung auf Metalle, Marmor, Holz, Leder, Fayance, Porzellan u.s.w. - Gräz : gedruckt bey den Gebrüdern Tanzer, 1803. - 2 vol. [522 p.] ; [c. 18] cm.

– Vol. 1: [...].

– Vol. 2: Praktisches Handbuch für Mahler und Lackirer, oder vollständige Anweisung zur Wasser- Oehl- Pastel- und Miniatur-Mahlerey; zur echten Bereitung und Mischung der trocknen und flüßigen Farben, nebst deren Anwendung, und der Bereitung aller Arten von Firnissen zum Anstreichen und Lackiren / aus den vorzüglichsten Schriften verschiedener Sprachen gesammelt und zu einem allgemeinen Handbuch für Künstler, Chymisten, Fabrikanten und Oekonomen bestimmt. - (Encyclopädie für Künstler ; Zweyter Band).
MIP: pp. 105, 108–115, 266–272, 360–386, 429–432.
§ Title description after digital photographs.
1 –
Line Etching
2 –
Copper
3 –
Hand-colouring / Ink / Print behind Glass
4 –
Nature Printing
5 –
Conservation and Restoration
In: FHK.

Preiß (Walter)   250

Alles über Foliengraphik. Ein Lehr- und Arbeitsbuch über Folien und Kunststoffe für Graphiker, Designer, Maler und Kunsterzieher / Walter Preiß. - München : Karl Thiemig, cop. 1971. - 184 p. : [195] ill., of which [58] ill. in colour ; 22 cm.
Contents: p. 8.
MIP: pp. 135–141 : [8] ill., of which [1] in colour.
Index on artists: p. 179.
Glossary: p. 180.
Suppliers: p. 184.
§ Title means: Everything about printmaking on foil. A study- and workbook about foils and plastics for printmakers, designers, painters and art teachers
The illustrations are diagrams, photographs and reproductions. The illustrations are numbered per chapter.
Intended audience, title page: 'für Graphiker, Designer, Maler und Kunsterzieher'.
1 –
Drypoint / Photomechanical Etching / Relief Etching
2 –
Plastic
3 –
Printing in Black
4 –
Lithography / Monotype
In: ABK; DNB-F; DBI-VK; NCC; OBA; OCLC; Priv.Coll.; ULC.

Preissig 1 (Vojtěch)   251.1

Barevný lept a barevná rytina. Technické poznámky ; Díl I / Vojt[ěch] Preissig. - Praha : Politika, 1909. - 109, [2] p. : ill. ; 8º + appendix.
§ Title means: Coloured etchings and coloured engravings. Technical remarks. Part I
Preissig wrote the text and drew the diagrams. He also created the typefont with which the book is printed that was specially devised for the Czech language; *Kalàb 1940.*
Prepared in 1907; *Brabcová 1995*: 35.
For details see the simultaneous German issue: Leipzig : Hiersemann, 1909 [No. 251.3].
NOT SEEN
In: KNC; NUC–1956; OCLC; ÖNB.

251.2

Barevný lept a barevná rytina. Technické poznámky ; Díl I / Vojt[ěch] Preissig. - [2nd ed. rev.]. - Praha : Státní tiskárna, 1925. - 88 p. : front., ill. ; 4º.
Literature: p. 73–84.
§ NUC–1956: '50 numbered copies autographed by the author'.
NOT SEEN
In: KNC; NUC–1956.

251.3

Zur Technik der farbigen Radierung & des Farbenkupferstiches : I. Teil / Vojt[ěch] Preissig ; Zeichnungen von V[ojtěch] Preissig. - Vorzugsausg. - Leipzig : Hiersemann, 1909. - 137, [6] p. : [32] diagrams + [4] colour etch. ; 19.5 cm
Literature: p. 113.
Suppliers: p. 133.
Contents: p. [2].
Advertisement: p. [6].
§ Translation of the edition: Praha 1909 [No. 251.1].
The preface is dated: 'Prag, im März 1907'.
Edition, supplementary sheet: 'Vorzugsausgabe mit 4 Tafeln und 140 S. Text. Nur in 50 Exempl. im Handel. Preis 12 Mark.' But see p. 2: 'Von diesem Buch wurden 100 Abzüge für Liebhaber hergestellt und sind mit den No 1–100, der Unterschrift des Verfassers und 4 Beilagen versehen.'
Copy nos. 60 and 67 have been seen.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint
2 –

Copper / Steel / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Printing à la Poupée / Printing Polychrome
In: ABK (missing the colour etchings); BN; DBI-VK; MMW; RMA.

251.4

Zur Technik der farbigen Radierung & des Farbenkupferstiches : I. Teil / Vojt[ěch] Preissig ; Zeichnungen von V[ojtěch] Preissig. - [Trade ed.]. - Leipzig : Hiersemann, 1909. - 125, [12] p. : [32] tek., [1] colour etch. ; 19 cm.
Literature: p. 99.
Suppliers: p. 119.
Contents: p. [2].
Advertisement: p. [10], [12].
§ Printer: Prag : Politika.
The preface is dated: 'Prag, im März 1907'.
The colour etching is bound as a frontispiece between pp. 2 and 3.
Published simultaneously with the Czech edition: Praha : Politika, 1909 [No. 251.1].
In: *Blas Benito 1994*: 85; CCB; DBI-VK; *Figueras Ferrer 1992*: 1063; HAUM; IBK 1978, 8 (1909): no. 2967 and 9 (1910): no. 2905; KB; NCC; NUC–1956; OCLC (2×); ÖNB; SBB; UBA; UBG; UBH.

Preissig 2 (Vojtěch)   252

Zur Technik der farbigen Radierung & des Farbenkupferstichs : II. Teil / Vojtěch Preissig. - Leipzig : Hiersemann. - 30 ill.
§ Title means: About the technique of colour etching and colour engraving: part 2
Announced in the 1909 trade edition (p. [10]): 'Mit 30 Original-Radierungen und Kupferstichen, wovon eine Anzahl farbig. Zu einer jeden dieser Beilagen, sowie zu jedem Teildrucke der farbigen Blätter gehört ein Text, welcher die Art des techn. Vorgangs erläutert. Ebenso sind die benützten Materialien u. Hilfsmittel, die verschiedenen Verfahren und deren Zeitdauer notiert, ev. auch solche technische Einzelheiten erklärt, die im I. Teil nicht berücksichtigt werden konnten. (Siehe z.B. Beilage 2, 3 und 4 in den Abzügen No. 1–100 des I. Teils.)'
Intended to be published in an edition of fifty copies.
NOT PUBLISHED

Prince (Jean Baptiste le)
See: **Le Prince** (Jean Baptiste) [No. 182].
See: **Le Prince 1** (Jean Baptiste) [No. 506].
See: **Le Prince 2** (Jean Baptiste) [No. 507].
See: **Le Prince 3** (Jean Baptiste) [No. 508].

Printing ink recipe   253.1

[Printing ink recipe]. - [Southern Netherlands], [1500–1525].
MIP: fol. 22r.
§ For a date and place of the ms. see *Vandamme 1974*, p. 105. Possibly the ms. should be dated more generally to 1501–1550.
Recipe for making black printing ink, probably for intaglio printing. Also contains prescriptions for etching iron dagger blades on the same page.
3 –
Ink
NOT SEEN
In: MPM, Ms. 64.

253.2

Een 16e-eeuws Zuidnederlands receptenboek / Erik Vandamme.
In: Jaarboek van het Koninklijk Museum voor Schone Kunsten Antwerpen. Antwerpen : Koninklijk Museum voor Schone Kunsten, 1974. - P. 101–137 : 5 fig.
MIP: p. 122, no. 37.
§ Recipe for making black printing ink probably for intaglio printing because of the black pigment made by charring the soft outer skins of walnuts.
In: KB; RMA; UBA.

Prinz (Manfred)
See: **Regel** (Günther) & **Prinz** (Manfred) [No. 262].

Profit (Georges)   254

Procédés élémentaires de la gravure d'art : eau-forte, burin, pointe sèche / Georges Profit ; gravures hors texte par A. Dézarrois, A. Boulard, A. Brunet-Debaines et G[eorges] Profit. - Paris : Plon, Plon Nourrit, 1913. - 128 p. : front., [4] pl., [51] diagrams ; 28.5 cm.
Glossary: p. 122.
Contents: p. 125.
§ The frontispiece is an etching. The *planches* are two etchings, two drypoints on one plate and one etching combined with engraving.
1 –
Drypoint / Line Engraving / Line Etching
2 –
Copper / Steelfacing
3 –
Casting / Ink / Paper / Parchment / Printing à la Poupée / Printing in Black
4 –
Troubleshooting
In: BL; *Blas Benito 1994*: 85; BLBS; BN; CCB; *Figueras Ferrer 1992*: 1064; IBK 1978, 12 (1913): no. 3330b; OBA; OBDH; OCLC; UBL-KHI.

Etching principles and methods. A manual on etching materials and processes for students and etchers / by Clifford Pyle ; photogr. by Roscoe J. Carver. - New York ; London : Harper & Brothers, 1941. - xii, 180 p. : front., 52 fig., X photogr., [12] pl. ; 22 cm.
Contents: p. v.
Suppliers: pp. 80, 101, 106.
Index: p. 177.
§ The frontispiece and the plates are reproductions, the figures are diagrams.
Intended audience, p. ix: 'The aim of the author has been to prepare a handbook that will serve as a practical guide to the various needs of the beginner as well as of the instructor.'
1 –
Aquatint / Drypoint / Line Etching / Mezzotint / Monotype / Relief Etching / Soft-ground
2 –
Aluminium / Copper / Iron / Plastic / Steel / Steelfacing / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Conservation and Restoration
In: BL; *Blas Benito 1994*: 85; BLBS; NUC–1956; OCLC (23×).

Q

Theoretisch-praktisches Handbuch, für Maler, Illumminirer, Zeichner, Kupferstecher, Kupferdrucker, und Formschneider, worinnen man den Gebrauch der Farben nebst Zubereitung derselben nach systematischen Grundsätzen bekannter Autoren, sehr leicht erkennen und erlernen kann. Nebst einer praktischen Abhandlung von den verschiedenen Arten der Malerey, auf Leinwand, Seide, Glas, Wachs, Mauern, mit Oel, 'en miniature' oder Pastell zu arbeiten. Zum Nutzen und Vergnügen für diejenigen, die sich dieser Kunst widmen / zusammengetragen, von einem Liebhaber der schönen Künste [Tobias Querfurt] ; […] Fritsch scu. - Wien : Mathias Ludwig, 1792. - 164, [4] p. : [1] etch. ; 18 cm.
MIP: pp. 102–160.
Contents: p. [1].
§ Title means: Theoretical-practical manual, for painters, illuminators, draughtsmen, engravers, plate printers, and woodcutters
Printer, p. [4]: 'Gedruckt by Joseph Hraschanzky'.
Title description after microfiches.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Line Engraving / Line Etching / Mezzotint / Stipple Engraving
2 –
Copper / Tin
3 –
Ink / Multiple-plate Printing / Paper / Parchment / Press / Printing in Black / Printing Monochrome
4 –
Painting / Troubleshooting / Woodcut
5 –
Aesthetics / Art history
In: KVK.

Theoretisch-praktisches Handbuch, für Maler, Illumminirer, Zeichner, Kupferstecher, Kupferdrucker und Formschneider, worinnen man den Gebrauch der Farben nebst Zubereitung derselben nach systematischen Grundsätzen bekannter Autoren, sehr leicht erkennen und erlernen kann. Nebst einer praktischen Abhandlung von den verschiedenen Arten der Malerey, auf Leinwand, Seide, Glas, Wachs, Mauern, mit Oel, 'en miniature' oder Pastell zu arbeiten. Zum Nutzen und Vergnügen für diejenigen die sich dieser Kunst widmen / zusammengetragen von einem Liebhaber der schönen Künste [Tobias Querfurt]. - Wien : Ludwig, 1800. - 122, [5] p. ; 18 cm.
MIP: pp. 60–115.
Contents: p. [1].
§ The text has been reset.
The contents are identical to those of the edition: Wien 1792.
Title description after photocopy.
In: DBSM; FHK; NSUG.

R

Radiertechniken
See: **Etstechnieken** [No. 096].

Die Radir- und Aetzkunst für Anfänger. - Halle [an der Saale] : beim Kunsthändler Dreyssig, [1796 or later]. - 39, [1] p. ; [1] etch. ; 17 cm.

List of places where Dreyssig's books are for sale: p. 2.

Stocklist: p. [1].

With literature.

§ Title means: The art of etching for beginners

Undated, but because of a reference to **Bosse** (Nürnberg 1795–1796) [No. 042.25] on p. 4, the publication can be dated 1796 or later.

The etching is printed on the title page.

Intended audience, title page: 'Anfänger'; for amateurs and students who want to make a living with etching.': p. 3.

1 –

Échoppe / Line Etching

2 –

Copper

In: NUC–1956; NYPL; *Singer & Strang 1897*: no. 81.

Ramos Guadix (Juan Carlos)   258.1

Técnicas experimentales del grabado: el collagraph / Juan C. Ramos. - Sevilla : Universidad de Sevilla, Facultad de Bellas Artes, 1986. - 67 p. ; 31 cm.

§ Title means: Experimental engraving techniques: the collagraph

Thesis (*tesina*) of the University of Seville.

See also: **Bøegh** (Granada 2004) [No. 037.5]; **Bøegh** (København 2010) [No. 037.6].

NOT SEEN

In: KVK.

258.2

Técnicas aditivas en el grabado contemporáneo / Juan Carlos Ramos Guadix. - Granada : Universidad de Granada, 1992. - 181 p. : colour ill. ; 22 cm.
- (Monográfica ; 122. Arte).

Literature: p. 177.

ISBN 84-3381624-1

§ Trade edition of the edition: Sevilla 1986.

Also published as a set of three microfiches in 1991.

NOT SEEN

In: BNM.

258.3

Cartografía del collagraph / Juan Carlos Ramos Guadix. - Granada : Virtual, 1999. - 160 p. : 16 colour ill. ; 21 cm.

Contents: p. 5.

List of illustrations: p. 7.

Literature: p. 152.

ISBN 84-89657-37-8

§ The *figuras* are reproductions.

1 –

Collagraph

3 –

Blind Embossment / Casting / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing Polychrome / Jigsaw Print / Relief Printing

5 –

Conservation and Restoration / Original and Reproduction

In: BNM.

Rauscher (Ludwig)   259.1

Positives Tiefdruckverfahren der Ton- und Strichaetzung / von Ludwig Rauscher ; mit einer Einleitung von Zoltán Takács von Felvincz. - [Trade ed.]. - [Budapest] : Königliche Ungarische Universitätsdruckerei, 1933. - 31 p. ; XIII Taf. ; 24.5–25 cm.

Contents: p. 31.

Edition: 500 copies.

§ Rauscher's text was published posthumously.

All copies contain *Tafel* I–VI, which are specimens of Rauscher's experiments in tonal etching. Tafel VII–XIII are *Probedrücke* that were bound with the first fifty copies and for the rest of the edition were only supplied after ordering and additional payment.

1 –

Aquatint / Line Etching

2 –

Steel / Zinc

5 –

Art History

In: DNB-L; DNB-L.

259.2

[...] / Ludwig Rauscher ; [introd. by Zoltán Takács von Felvincz]. - [Budapest] : [Königliche Ungarische Universitätsdruckerei], 1933.

Edition: 500 copies.

§ The same text in Hungarian.

NOT SEEN

Reddy (N. Krishna)   260

Intaglio simultaneous color printmaking : significance of materials and processes / by N. Krishna Reddy. - Albany : State University of New York Press, cop. 1988. - x, 142 p. : 47 ill., 16 colour pl. ; 26.5 cm.

Contents: p. vii.
List of illustrations: p. ix.
Glossary: p. 133.
Literature: p. 138.
Index: p. 141.
ISBN 0-88706-739-5 (hardcover)
ISBN 0-88706-740-9 (softcover)
§ The illustrations are diagrams, photographs and tables. The plates are photographs, reproductions and tables.
1 –
Aquatint / Lift-ground / Line Engraving / Line Etching / Photomechanical Etching / Relief Etching / Soft-ground
2 –
Copper / Steel / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Printing à la Poupée / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Lithography / Screen Printing
5 –
Aesthetics / Art History
In: DBI-VK; KSM; OCLC; Priv.Coll.

Reed (Earl Howell)   261.1

Etching : a practical treatise / by Earl H[owell] Reed ; [ill. by the author]. - [1st ed.]. - New York ; London : Putnam's Sons ; New York : The Knickerbocker Press, 1914. - xii, 148 p. : front., [2] diagrams, [2] etch. ; 26 cm.
Contents: p. ix.
List of illustrations: p. xi.
Suppliers: p. 58.
Specimens: opp. p. 74.
With literature.
§ The introduction is dated, p. vii: 'Chicago, June 1914'.
Probably the deluxe edition given the additional etchings.
The frontispiece is an etching. The illustrations are two diagrams, two etchings and one page with four reproductions. The first etching (opp. p. 74) is a leaf with specimens.
Without index.
Intended audience, p. v: 'This book is intended for the student.'
1– Aquatint / Drypoint / Line Etching / Soft-ground
2 –
Copper / Brass / Steelfacing / Zinc
3 –
Ink / Paper / Press / Printing in Black
In: BL; CCB; NUC–1956; OCLC; TUD.

261.2

Etching : a practical treatise / by Earl H[owell] Reed ; [ill. by the author]. - [1st ed.]. - London ; New York : Putnam's Sons, 1914. - x, [2], 153 p. : [2] diagrams ; 25–25.5 cm.
Contents: p. ix.
Suppliers: p. 58.
Index: p. 151.
With literature.
§ The introduction is dated, p. vii: 'Chicago, June 1914'.
Probably the trade edition as it lacks the etchings, reproductions and the list of illustrations.
In: BLBS; Priv.Coll. (2×).

261.3

[Notes on etching] / G.P.H. - [S.l.], [1920–1930].
In: **Reed** (London 1914, trade ed.) [No. 261.2], throughout the text.
§ Manuscript.
Language: Dutch.
Remarks with and translations of Reed's text into Dutch, many passages underscored.
Ex libris, front pastedown: 'GPH'.
1 –
Line Etching
In: Priv.Coll.

261.4

Etching : a practical treatise / Earl H[owell] Reed ; illustrated by the author. - [2nd ed.]. - London ; New York : Putnam, [1924].
NOT SEEN
In: BL; BLBS.

Regel (Günther) & **Prinz** (Manfred) 262.1

Techniken des bildnerischen Gestaltens. Ein Handbuch für das Selbststudium und die Lehrtätigkeit in Schule, Arbeitsgemeinschaft und Laienzirkel / Erarbeitet von einem Autorenkollektiv des Instituts für Kunsterziehung an der Ernst-Moritz-Arndt-Universität Greifswald unter die Leitung von Günther Regel und Manfred Prinz. - [1st ed.]. - Berlin : Volk und Wissen, 1965. - 288 p. : front. Abb. ; 8º. - (Schriften zur Kunsterziehung ; 20).
Literature: p. 286.

§ The preface is dated: Greifswald, Im Frühjahr 1963'.
NOT SEEN
In: DNB-F.

Techniken des bildnerischen Gestaltens. Ein Handbuch für das Selbststudium und die Lehrtätigkeit in Schule, Arbeitsgemeinschaft und Laienzirkel / Erarbeitet von einem Autorenkollektiv des Instituts für Kunsterziehung an der Ernst-Moritz-Arndt-Universität Greifswald unter die Leitung von Günther Regel und Manfred Prinz. - 2. Aufl. - Berlin : Volk und Wissen, 1968. - 288 p. : front., Abb. ; 8º. - (Schriften zur Kunsterziehung ; 20).
NOT SEEN
In: DNB-F.

Techniken des bildnerischen Gestaltens. Ein Handbuch für das Selbststudium und die Lehrtätigkeit in Schule, Arbeitsgemeinschaft und Laienzirkel / Erarbeitet von einem Autorenkollektiv des Instituts für Kunsterziehung an der Ernst-Moritz-Arndt-Universität Greifswald unter die Leitung von Günther Regel und Manfred Prinz. - 3. Aufl. - Berlin : Volk und Wissen, 1971. - 288 p. : front., Abb. ; 8º. - (Schriften zur Kunsterziehung ; 20).
NOT SEEN
In: DNB-F.

Techniken des bildnerischen Gestaltens. Ein Handbuch für das Selbststudium und die Lehrtätigkeit in Schule, Arbeitsgemeinschaft und Laienzirkel / [Erarbeitet von einem Autorenkollektiv des Instituts für Kunsterziehung an der Ernst-Moritz-Arndt-Universität Greifswald unter die Leitung von Günther Regel und Manfred Prinz]. - 4. Aufl. - [Berlin] : Volk und Wissen, 1977. - 288 p. : front., Abb., partly in colour ; 24 cm. - (Schriften zur Kunsterziehung ; 20).
NOT SEEN
In: DNB-F.

Techniken des bildnerischen Gestaltens ... [etc.] / Hrsg. Günther Regel, Manfred Prinz. - Erweiterte Neuaufl. - Berlin : Volk und Wissen, 1982. - 287 p. : 295 ill., partly in colour ; 30 cm.
§ The preface is dated: 'Greifswald, November 1979'.
NOT SEEN
In: DNB-F; DNB-L.

Techniken des bildnerischen Gestaltens. Ein Handbuch für das Selbststudium unf für die Arbeit in Schule, Arbeitsgemeinschaften und künstlerischen Zirkeln / Günther Regel, Heide Klingbeil. - 2. Aufl. der erweiterten Neuaufl. - Berlin : Volk und Wissen : 1985. - 288 p. : ill., 1985.
Literature: p. 285.
NOT SEEN
In: DNB-F; DNB-L.

Techniken des bildnerischen Gestaltens. Ein Handbuch für das Selbststudium und für die Arbeit in Schule, Arbeitsgemeinschaften und künstlerischen Zirkeln / von einem Autorenkollektiv [Günther Regel, Martin Stelzig, Konrad Homberg, Manfred Prinz, Karl-Heinz Splanemann, Kurt Feltkamp, Dieter Didschuneit, Dagmar Lißke] ; Hrsg. Manfred Prinz ; redaktionelle Betreuung Heide Koberstein, Arno Neumann. - Erweiterte Neuausg. - Berlin : Volk und Wissen, 1989. - 288 p. : 295, [1] ill., of which [130] in colour ; 30 cm.
MIP: pp. 148–156 : fig. 159–168.
Subject index: p. 281.
Literature: p. 285.
Contents: p. 287.
ISBN 3-06-172509-1 (hardcover)
§ Date of editing, p. 280: 'Redaktionsschluß: 15. Januar 1987'.
The *Illustrationen* are diagrams, photographs and reproductions.
Intended audience, title page: 'für das Selbststudium und für die Arbeit in Schule, Arbeitsgemeinschaften und künstlerischen Zirkeln'.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Mezzotint
2 –
Aluminium / Copper / Plastic / Steel / Zinc
3 –
Printing in Black
4 –
Ceramics / Drawing / Linoleum Cut / Lithography / Mosaic / Monotype / Painting / Sculpture / Screen Printing / Sgraffito / Woodcut
5 –
Aesthetics / Health and Safety
In: DNB-F; DNB-L; Priv.Coll.

Regeln, so im Kupferdrucken, so woln in abtruckung der Holzstöck fleisig in obacht zunemen.
In: Orndliche verzeichnus vnnd Registratur, aller meiner 1. geschnittenen Kupfer, 2. Holzkunst 3., vnnd gegossenen Bleistück, so viel ich nacheinander deroselben zuhanden gebracht / Paulus Behaim von Schwarzbach. - [Nürnberg?], 1618–1628. - 229 p. ; 16.5 ´ 22 cm.
MIP: pp. 215–226.
§ Title means: Rules to diligently take care of in printing engravings as well as woodcuts.
Manuscript.
Language: German.
The 'Regeln' are dated, p. 215: Actum Anno 1628 16. Novembris.
The text was written by an anonymous printer for Paulus Behaim, who kept a large private collection of printing blocks and plates.
The earliest text that instructs all elements of intaglio printing in greater detail. According to the title, instructions for the printing of woodblocks

were to follow the instructions for plate printing, but this text was never added.
The manuscript is discussed in the (not yet published) dissertation of Jasper Kettner.
Title description of the 'Regeln' after a transcription by Anja Grebe.
2 –
Copper
3 –
Ink / Paper / Press / Printing in Black
5 –
Conservation and Restoration
NOT SEEN
In: SBBa, JH. Msc. Art. 66; http://bvbm1.bib-bvb.de/webclient/DeliveryManager?pid=2934974&custom_att_2=simple_viewer (2011).

Rembrandt van Rijn
See: **Van Rijn** (Rembrandt) [No. 344].

Rhead (George Woolliscroft)   264
Etching / by G[eorge] Woolliscroft Rhead ; with ill. by the author. - London : Well's Gardner, Darton, [1890]. - I–xvi, 17–77, [1] p. : front., [11] fig. ; 18 cm. - (Darton's Manuals for home work).
Contents: p. xv.
Suppliers: pp. 18, 19, 48, 63.
Plate printers: p. 48.
Stocklist: p. [1].
With literature.
§ The frontispiece is an etching.
1 –
Aquatint / Crayon Engraving / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Steelfacing / Zinc
3 –
Casting / Paper / Printing in Black
5 –
Art History
In: BL; BLBS; *Levis 1912*: 108; NUC–1956; OCLC (3×); *Singer & Strang* 1897: no. 367.

Richomme (Joseph-Theodore)   265
Leçons sur la manière de graver la musique / Theodore Joseph Richomme. - Paris : Librairie industrielle, 1829. - VII–32 p. : pl. ; 8º.
§ Title means: Lessons in engraving music
1 –
Line Engraving
NOT SEEN
In: BNF.

Rigal (Nicole)
See: **Lebourg-Rigal** (Nicole) [No. 184].

Rijn (Rembrandt van)
See: **Van Rijn** (Rembrandt) [No. 344].

Robert (Henri)   266.1
Traité de gravure de musique sur planches d'étain et d'autographie ou simili gravure précédé de l'historique abrégé de l'impression et de la gravure de musique / Henri Robert. - Paris : Robert [?], [c. 1900]. - 82 p. ; 23 cm.
§ Title means: Treatise on the engraving of music on tin plates and on authography or 'simili gravure', preceded by a short history of printing and engraving music
BL: '1902'.
1 –
Line Engraving
2 –
Tin
4 –
Line Block
NOT SEEN
In: BL; IBK 1978, 1 (1902): no. 3558.

266.2
Traité de gravure de musique sur planches d'étain et des divers procédes de simili gravure de musique : précédé de l'historique du signe, de l'impression et de la gravure de musique / Henri Robert ; vign. de Henri Robert Fils. - Deuxième éd. - Paris : Chez l'auteur, 1926. - 151 p. : 69, A + [1] fig., 9 tabl., [18] reprod., vign. ; 23–25 cm.
List of French engravers of musical annotation: p. 49.
MIP: pp. 59–101 : fig. 38–65 + [1], fig. A, [7] reprod., vign.
Musical terms: pp. 112, 139.

Contents: p. 149.
Addenda & corrigenda: loose sheet.
With literature.
§ Title on cover: Gravure de musique simili gravure traité précédé de l'historique du signe de musique = de l'impression = et de la gravure de musique
Title on spine: Traité de gravure de musique
Editing and augmenting, p. 7: 'Dans cette nouvelle Edition, nous y avons développé plus amplement certains points du travail, nous y avons donné plus d'exemples qui guideront plus sûrement l'élève.'
With reproductions of autographs of musical composers, printed and painted imagery.
1 –
Line Engraving
2 –
Aluminium / Tin / Zinc
3 –
Printing in Black
4 –
Line Block / Photography
5 –
Health and Safety
In: BL; KB; OBA; ULC.

Robert (Karl)
See: **Meusnier** (Georges) [No. 207].

Robertson (Bruce) & **Gormley** (David)   267
Learn to print step-by-step / Bruce Robertson and David Gormley ; ill. Graham Rosewarne. - London ; Sydney : Macdonald Orbis, 1987. - 192 p. : ill. ; 25.5 cm.
MIP: pp. 82–123 : [170] ill.
Index: p. 190.
Suppliers: p. 192.
Titles in the series: back flap.
ISBN 0-356-12457-6 (hardcover)
§ The illustrations are diagrams, graphic designs, photographs, reproductions and tables.
1 –
Aquatint / Collagraph / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Aluminium / Copper / Plastic / Steel / Zinc
3 –
Printing in Black / Printing Monochrome
4 –
Linocut / Lithography / Marbling / Monotype / Nature Printing / Screen Printing / Typography / Woodcut / Wood Engraving
5 –
Art History / Conservation and Restoration
In: BL; GBR; NCC; OCLC; Priv.Coll.

Robertson (Carol)
See: **Adam** (Robert) & **Robertson** (Carol) [No. 005].

Robertson (Henry Robert)   268.1
The art of etching explained and illustrated : with remarks on the allied processes of drypoint, mezzotint and aquatint / H[enry] R[obert] Robertson ; [etch. by Henry Robert Robertson]. - [1st ed.]. - London : Winsor & Newton, 1883. - 64 p. : 2 etch., of which [1] printed; 18.5 cm. - (One shilling handbooks on art ; 33).
Advertisement: p. 61.
§ The text was constantly reprinted.
The etchings are specimens showing a first state in black ink and a second state in brown ink.
Review: *The Art-Journal*, new series (1883): 240.
NOT SEEN
In: BL; BLBS; *Bridson & Wakeman 1984*: no. B32; OCLC (20×); *Singer & Strang 1897*: no. 310; ULC (2×).

268.2
The art of etching explained and illustrated : with remarks on the allied processes of drypoint, mezzotint, and aquatint / H[enry] R[obert] Robertson. - Second ed. - London : Winsor & Newton, 1883. - 62, [2] p. : 2 etch. ; […] cm.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B32; OCLC (2×).

268.3
The art of etching explained and illustrated : with remarks on the allied processes of drypoint, mezzotint and aquatint / H[enry] R[obert] Robertson. - 3rd ed. - London : Winsor & Newton, 1883.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B32; NUC–1956; OCLC (3×).

268.4
The art of etching explained and illustrated : with remarks on the allied processes of drypoint, mezzotint and aquatint / H[enry] R[obert] Robertson.

- 4th ed. - London : Winsor & Newton, 1885. - 64 p.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B32; NUC–1956; OCLC.

The art of etching explained and illustrated : with remarks on the allied processes of drypoint, mezzotint and aquatint / H[enry] R[obert] Robertson.
- 5th ed. - London : Winsor & Newton, 1885.
NOT SEEN
In: OCLC (2×).

The art of etching explained and illustrated : with remarks on the allied processes of drypoint, mezzotint and aquatint / H[enry] R[obert] Robertson.
- 6th ed. - London : Winsor & Newton, 1885.
NOT SEEN
In: NUC–1956; OCLC.

The art of etching explained and illustrated : with remarks on the allied processes of drypoint, mezzotint and aquatint / H[enry] R[obert] Robertson.
- Eighth thousand. - London : Winsor & Newton, [c. 1900?]
NOT SEEN
In: NUC–1956; OCLC.

The art of etching explained and illustrated; with remarks on the allied processes of drypoint, mezzotint, and aquatint / H[enry] R[obert] Robertson.
- Ninth thousand. - London : Winsor & Newton, [1910?]. - 64, 64 p. : [2] etch., of which [1] printed in brown ; 18 cm. - (One shilling hand-books on art ; 33).
Contents: p. 3.
Advertisement: p. 1, at the back.
Stocklist: backside cover.
With literature.
§ Title on cover: The art of etching on copper explained and illustrated; with remarks on the allied processes of drypoint, mezzotint, and aquatint
Printer: London: McCorquodale & Co. Limited.
Possibly published after 1910.
The second part is a Winsor & Newton's catalogue of artists' materials.
1 –
Aquatint / Drypoint / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Steel / Steelfacing / Zinc
3 –
Counterproof / Ink / Paper / Printing in Black / Printing Monochrome
In: Priv.Coll.

The art of etching explained and illustrated : with remarks on the allied processes of drypoint, mezzotint and aquatint / H[enry] R[obert] Robertson.
- Eleventh thousand. - London : Winsor & Newton, 1913.
Advertisement: p. 64.
NOT SEEN
In: OCLC (5×).

The art of etching explained and illustrated : with remarks on the allied processes of drypoint, mezzotint and aquatint / H[enry] R[obert] Robertson ; [etch. by Henry Robert Robertson]. - Fifteenth thousand. - London : Winsor & Newton, [c. 1915?]. - 64, 8 p. : [2] etch., of which [1] printed in brown ; 18.5 cm. - (One shilling and threepenny handbooks on art ; 33).
Contents: p. 3.
With literature.
Advertisement: p. 1, at the back.
Stocklist: backside cover.
§ Title on cover: The art of etching
The text has been reset.
Printer: London and Beccles: William Clowes and Sons.
In: Priv.Coll.; RAA.

[Notes on etching]. - [S.l.], [1915–1925?].
In: **Robertson** (London 1915), [No. 268.10], throughout the text, inside back cover.
§ Manuscript.
Language: English.
Short pencil notes accompanying the text, several passages are underscored. Questions written in pencil notes relating to etching materials and techniques on the inside of the back cover.
1 –
Line Etching
In: Priv.Coll.

Robins (William Palmer)   269.1

Etching craft : a guide for students and collectors / by W[illiam] P[almer] Robins ; with a foreword by Martin Hardie. - First published. - London : The Bookman's Journal & Print Collector, 1922. - xvi, 244, 12 p. : [10], [95] ill. ; 26 cm.
Contents: p. xi.

List of illustrations: p. xiii.
Literature: p. 221.
Index: p. 239.
Advertisement: p. 1 at the back.
Stocklist: p. 9 at the back.
§ Intended audience, p. 4: 'In this book I have been actuated by the desire to bring together information of use to both the collector and the student.'
See also: **Robins** (1953) [No. 569].
1 –
Aquatint / Drypoint / Line Etching / Soft-ground
2 –
Copper / Steelfacing / Zinc
3 –
Counterproof / Ink / Paper / Press / Printing in Black
5 –
Art History / Conservation and Restoration
In: BL; *Blas Benito 1994*: 86; BLBS; NUC–1956; OCLC; Priv.Coll.; RAL; RMA; ULC.

269.2

Etching craft : a guide for students and collectors / by William Palmer Robins ; with a foreword by Martin Hardie. - London : The Bookman's journal & print collector ; New York : Dodd, Mead, 1923
NOT SEEN
In: NUC–1956; OCLC; RHM.

269.3

Etching craft : a guide for students and collectors / by William Palmer Robins ; with a foreword by Martin Hardie. - London : The Bookman's journal & print collector, 1924.
NOT SEEN
In: NUC–1956; OCLC (24×).

269.4

Etching craft : a guide for students and collectors / by William Palmer Robins ; with a foreword by Martin Hardie. - Second impression. - London : Batsford, 1924. - xvi, 244, [8] p. : [10], [95] ill. ; 26 cm.
Contents: p. xi.
List of illustrations: p. xiii.
Literature: p. 221.
Index: p. 239.
Advertisement: p. 1, at the back.
§ Without stocklist.
In: NUC–1956; Priv.Coll.; ULC.

Roller (Josef)   270.1
Technik der Radierung. Eine Anleitung zum Radiren und Aetzen auf Kupfer / von J[osef] Roller. - [1st ed.]. - Wien ; Pest; Leipzig : Hartleben, 1888. - [2], p. [XIX]–XXX, [2], 133, [3], [16] p. ; 18–19 cm. - (Chemisch-technische Bibliothek ; CLV).
Contents: p. XXIII.
Index: p. XXV.
Suppliers: p. 34.
Literature: p. 129.
Stocklist: p. [1]–[3] at the back.
List of titles in the series: p. [1]–[16] at the back.
Issued in a paper cover and in a full linen cover.
Reprint: Zürich 1997 [No. 270.10].
1 –
Aquatint / Crayon Engraving / Drypoint / Échoppe / Electrolytic Etching / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Copper / Steel / Steelfacing
3 –
Casting / Chine Collé / Counterproof / Ink / Paper / Parchment / Press / Printing in Black / Textile
5 –
Health and Safety / Original and Reproduction
In: BL; BLBS; DBI-VK; HAB; HAUM; HGKB; KSM; NSUG; OCLC; ÖNB; SBB; *Singer & Strang 1897*: no. 351.

270.2

Technik der Radierung. Eine Anleitung zum Radieren und Ätzen auf Kupfer / von Josef Roller ; [Vorwort von dem Verfasser]. - Zweite Aufl. - Wien ; Leipzig : Hartleben, 1903. - XIV, [2], 136 p. + [16] p. ; 18–18.5 cm. - (Chemisch-technische Bibliothek ; 155).
Contents: p. VII.
Index: p. XI.
Suppliers: pp. 34–35.
Literature: p. 129.
Stocklist: p. 134.
List of titles in the series: p. [1]–[16] at the back.
§ With most copies the list of titles in the series is added.
In: ABK; CCB; GMPL; HGKB (missing); IBK 1978, 2 (1903): no. 5242; KB; NUC–1956; OCLC; TUD; UBLz.

Technik der Radierung. Eine Anleitung zum Radieren und Ätzen auf Kupfer / von Josef Roller ; [Vorwort von A. Roller]. - Dritte Aufl. - Wien ; Leipzig : Hartleben, 1911. - VIII, 128 p. + [16] p. ; 18.5–19 cm. - (Chemisch-technische Bibliothek ; 155).
Contents: p. V.
Suppliers: pp. 32, 33.
Literature: p. 122.
Index: p. 127.
With stocklist.
§ The text has been reset but not changed.
In most cases the list of titles in the series is added.
Issued in a paper cover and in a full linen cover.
The paper cover edition is 18.5 cm high and has the stocklist printed on the inside of the covers. The hard cover edition is 19 cm high.
In: ABK; BL; BLBS; DBI-VK; MBKL; NUC–1956; OCLC; Priv.Coll. (2×); RKD; SBB; TUD.

Technik der Radierung. Eine Anleitung zum Radieren und Ätzen auf Kupfer / von Josef Roller ; Vorwort A. Roller. - Vierte Aufl. / Durchsicht und Verbesserungen von [?] Emmerich-Selch. - Wien ; Leipzig : Hartleben, 1919. - VIII, 136 p. ; 18.5–19 cm. - (Chemisch-technische Bibliothek ; 155).
Contents: p. V.
Suppliers: p. 34.
Literature: p. 129.
Index: p. 135.
Stocklist: inside paper front cover, in- and outside paper back cover.
§ The chemical-technical part is edited by Emmerich-Selch, the rest is slightly changed.
The paper cover edition is 18.5 cm high and has the stocklist printed on the inside of the covers. The hard cover edition is 19 cm high.
In: DNB-L; OBA; ÖNB; SBB.

Technik der Radierung. Eine Anleitung zum Radieren und Ätzen auf Kupfer / von Josef Roller ; Vorwort zur fünften Auflage A. Roller. - Fünfte Aufl. - Wien ; Leipzig : Hartleben, 1922. - VII, [1], 95 p. ; 18.5–19 cm. - (Chemisch-technische Bibliothek ; 155).
Contents: p. V.
Suppliers: p. 23.
Literature: p. 89.
Index: p. 93.
Stocklist: inside paper front cover, in- and outside paper back cover.
§ The text has been reset and is almost identical to the 1919 edition with some minor editing.
The paper cover edition is 18.5 cm high and has the stocklist printed on the inside of the covers. The hard cover edition is 19 cm high.
In: ENS (2×); HGKB; NUC–1956; OCLC (2×); ÖNB; UBAB.

Practische handleiding bij het etsen op koper. Een onmisbare vraagbaak voor allen die zich op het etsen willen toeleggen. Bevattende[:] inleiding - over het radeeren en etsen in het algemeen - benoodigdheden en materialen - technologie van het koper - voorbereiding van de plaat - het radeeren - het bijten - kunstdruk en drukproeven - het verstalen der platen - het afwerken der afdrukken - het retoucheren enz. enz. / door J[osef] Roller. - [1st ed.?]. - [Amsterdam?] : [A. van Klaveren?], [1889?]. - XII, 139 p. ; 18.5 cm.
Contents: p. V.
Index: p. IX.
Suppliers: pp. 35, 36.
With literature.
§ Title means: Practical manual to etching on copper. An indispensable reference book for all those who want to take themselves to etching. Containing: introduction – about drawing and etching in general – requisites and materials – technology of the copper – preparation of the plate – drawing – biting – prints and proofs – steelfacing the plates – finishing the impressions – retouching etc. etc.
Translation of the edition: Wien 1888.
Without *impressum*. Some copies have an *impressum* without the year stamped on the cover: Amsterdam: A.J. Nuss v/h C.L.C. Voskuil.
In: BL; BLBS; CCB; NUC–1956; Priv.Coll.; UBL-KHI; RMA; UBU.

[Notes on etching] / Jan Petrus Ponstijn. - Amsterdam, 1943–1948. - 11 fol. + magazine clipping ; [various sizes].
In: **Roller** (Amsterdam 1889) [No. 270.6], loose sheets kept in a recent cover pasted to the inside of the back cover.
§ Manuscript.
Language: Dutch.
The volume has Ponstijn's *ex libris*. On the page with the French title is written: 'Jan Ponstijn tijdens de evacuatie A dam febr. '43'. Further dates given are: 'October 1943', 'febr. 49' (both fol. 1r), '3 October 44' (fol. 2v).
Contains recipes for etching grounds, acids and colour intaglio inks. The volume of Roller's manual itself is filled with manuscript notes in pen and pencil by Ponstijn, either written on the pages or on notes pasted onto the pages. Fol. [1]–[5] are loose sheets containing notes in pen and pencil, fol. 6–11 are in typescript.
Ponstijn (1883–1970) was an etcher and draughtsman.
1 –
Line Etching / Soft-ground
2 –
Copper / Zinc
3 –
Ink / Multiple-plate Printing / Printing Polychrome
In: RMA, 638 F 36.

Practische handleiding bij het etsen op koper. Een onmisbare vraagbaak voor allen die zich op het etsen willen toeleggen. Bevattende: inleiding -

over het radeeren en etsen in het algemeen - benoodigdheden en materialen - technologie van het koper - voorbereiding van de plaat - het radeeren - het bijten - kunstdruk en drukproeven - het verstalen der platen - het afwerken der afdrukken - het retoucheren enz. enz. / door J[osef] Roller. - [2nd ed.?]. - Amsterdam : Van Klaveren, [1889?]. - XII, 139 p. ; 19.5 cm.
Contents: p. V.
Index: p. IX.
Suppliers: p. 35.
With literature.
§ The text for the cover has been reset, the text of the bookblock is identical to the above edition.
The *impressum* printed on the cover: A.J. Nuss v/h C.L.C. Voskuil.
With a reproduction printed on the front cover.
In: CCB; RAA; UBA; NCC; Priv.Coll. (2×); UBU-KHI.

270.9

Practische handleiding bij het etsen op koper. Een onmisbare vraagbaak voor allen die zich op het etsen willen toeleggen, bevattende[:] inleiding - over het radeeren en etsen in het algemeen - benoodigdheden en materialen - technologie van het koper - voorbereiding van de plaat - het radeeren - het bijten - kunstdruk en drukproeven - het verstalen der platen - het afwerken der afdrukken - het retoucheren enz. enz. / door J[osef] Roller. - [3rd ed.?]. - Amsterdam : A. van Klaveren [A.J. Nuss], [1889?]. - XII, 139 p. ; 19.5 cm.
Contents: p. V.
Index: p. IX.
Suppliers; pp. 35, 36.
With literature.
Stocklist: backside cover.
§ The text for the cover has been reset, the text of the bookblock is identical to the above edition.
The front cover is identical to the title page, but the name of the publisher A. van Klaveren is overprinted with two black lines. In between 'Met alphabetisch register' and 'Amsterdam'
the name 'A. J. NUSS' is printed.
Without the reproduction on the front cover.
In: RMA.

270.10

Technik der Radierung. Eine Anleitung zum Radieren und Ätzen auf Kupfer / von Josef Roller. - [Repr.]. - Zürich : Danowski, 1997. - 152 p. ; […] cm.
Literature: p. 129.
ISBN 83-7176-708-0
§ Reset and reprinted by hand. Handbound copies are supplied on demand.
Deluxe reprint of: Wien 1888 [No. 270.1].
NOT SEEN
In: VLB, 1997–1998.

Romano (Clare)
See: **Ross** (John) & **Romano** (Clare) [No. 272].

Rops (Félicien)   271.1

Omniana artistique. Notes / Félicien Rops. - [Paris], [1873–1894]. - P. [1], 1–33, 38–55, 55–70 : [9] ill. ; […] cm.
Supplier: p. 13.
§ Manuscript.
Language: French.
Although the paging is erratic, the text is continuous. Pages 65–69 are blank.
The illustrations are drawings in pen and ink.
Title description after: 1982 [No. 271.2].
For an essay by Rops on soft-ground, see: **Delâtre** (Auguste-Marie) [No. 074].
1 –
Aquatint / Drypoint / Lift-ground / Line Etching / Soft-ground
2 –
Aluminium / Brass / Copper / Steel / Zinc
4 –
Drawing
5 –
Art History
NOT SEEN
In: BN, Réserve du Cabinet des Estampes, cote Yb3.391.d.

271.2

Félicien Rops: 'Omniana artistique. Notes' / texte établi et présenté par André Guyaux.
In: Le livre et l'estampe. - Vol. 28 (1982), no. 109–110. - P. 7–87 : [32] reprod.
Suppliers: p. 52.
§ Reproduction of the written pages of the ms.: pp. 13–44.
Transcription of the ms.: pp. 45–87.
The editor does not give a collation of the ms.
In: KB; KBR; RMA.

Ross (John) & **Romano** (Clare)   272.1

The complete printmaker : the art and technique of the relief print, the intaglio print, the collagraph, the lithograph, the screen print, the dimensional print, photographic prints, children's prints, collecting prints, print workshop / John Ross, Clare Romano. - [1st ed.]. - New York : The

Free Press ; London : Collier-Macmillan, cop. 1972. - xiv, 306 p. : [544] ill., of which [27] in colour ; 31.5 cm.

Contents: p. ix.

List of b/w reproductions: p. xii.

List of colour reproductions: p. xiv.

MIP: pp. 75–148 : [58] ill., of which [5] in colour.

Suppliers: p. 277.

List of screen printing inks: p. 281.

List of papers: 282.

Roller presses: 284.

Lithographic presses: p. 292.

Literature: p. 295.

Index: p. 299.

§ The Free Press is a division of Macmillan.

The illustrations are diagrams, photographs and reproductions.

1 –

Aquatint / Collagraph / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground

2 –

Aluminium / Copper / Magnesium / Steel / Steelfacing / Zinc

3 –

Blind Embossment / Casting / Chine Collé / Ink / Jigsaw Print / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Screen Printing / Viscosity Colour Printing

4 –

Linocut / Lithography / Nature Printing / Photomechanical Processes / Screen Printing / Woodcut / Wood Engraving

5 –

Aesthetics / Art History / Conservation and Restoration / Health and Safety

In: BL; *Blas Benito 1994*: 86; BNM; CCB; DBI-VK; *Figueras Ferrer 1992*: 1066; GMPL; KSM; NCC; OBA; OCLC; Priv.Coll. (2×); UBA (2×); UBU; ULC.

The complete printmaker : techniques/traditions/innovations / John Ross, Clare Romano, Tim Ross ; ed. and prod. by Roundtable Press. - [2nd] rev. and exp. ed. - New York : The Free Press ; London : Collier Macmillan, [cop. 1990]. - viii, 352 p. : [600] ill., of which [40] in colour ; 30.5 cm.

MIP: pp. 65–142 : [199] ill., of which [6] in colour.

Contents: p. vi.

Printmaking for children: p. 329.

Suppliers: p. 337.

Roller and lithographic presses: p. 340.

List of screen printing inks: p. 341.

List of papers: p. 342.

Literature: p. 344.

Glossary: p. 346.

Index: p. 349.

ISBN 0-02-927371-4 (hardcover)

ISBN 0-02-927372-2 (softcover)

§ The Free Press is a division of Macmillan.

The illustrations are diagrams, photographs and reproductions.

1 –

Aquatint / Collagraph / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground

2 –

Aluminium / Brass / Copper / Magnesium / Steel / Zinc

3 –

Blind Embossment / Casting / Chine Collé / Ink / Jigsaw Print / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Screen Printing / Viscosity Colour Printing

4 –

3D Print / Bookbinding / Digital Printmaking / Linocut / Lithography / Monotype / Nature Printing / Photomechanical Processes / Screen Printing / Woodcut / Wood Engraving

5 –

Aesthetics / Art History / Art Dealing / Conservation and Restoration / Health and Safety

In: *Blas Benito 1994*: 86; BNM; OCLC; Priv.Coll.

The complete intaglio print : the art and technique of the intaglio print, the collograph, photographic intaglio, care of prints, the dealer and the edition, collecting prints, print workshop, sources and charts / John Ross, Clare Romano ; [preface by Rudy Pozzatti]. - New York : The Free Press ; London : Collier-Macmillan, [cop. 1974]. - xiv, 121 p. : ill., partly in colour ; 30.5 cm.

Contents: p. ix.

List of b/w reproductions: p. xi.

List of colour reproductions: p. xii.

Suppliers: p. 103.

List of papers: p. 106.

Roller presses: p. 110.

Literature: p. 117.

Index: p. 119.

§ Independent issue of the edition: New York 1972. Pp. 75–138, 217–227, 241–266.

Some illustrations are replaced.

The Free Press is a division of Macmillan.
The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Collagraph / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Aluminium / Brass / Copper / Magnesium / Steel / Zinc
3 –
Chine Collé / Ink / Jigsaw Print / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Screen Printing / Viscosity Colour Printing
4 –
Troubleshooting
5 –
Aesthetics / Art History / Conservation and Restoration / Health and Safety
In: BIP+; BL; *Blas Benito 1994*: 86; BNB50; KVB; NCC; OCLC; Priv.Coll.; UBA; ULC.

272.4

The complete new techniques in printmaking : the art and technique of the collagraph, the dimensional print, dry lithography, photographic prints, care of prints, the dealer and the edition, collecting prints, print workshop, sources and charts / John Ross, Clare Romano ; with a foreword by Rudy Pozzatti ; photographs and diagrams by John Ross. - New York : The Free Press ; London : Collier Macmillan, [cop. 1972, 1974]. - xiv, 133, [8] p. : [214] ill., of which [17] in colour ; 30.5 cm.
Contents: p. ix.
List of b/w reproductions: p. xi.
List of colour reproductions: p. xii.
MIP: pp. 19–42 : [42] ill.
Suppliers: p. 109.
Literature: pp. 112, 127.
Index: p. 131
§ Independent issue of the edition: New York 1972. Pp. 97–101, 118–148, 259–266, 277–293.
Some illustrations are replaced or omitted.
The Free Press is a division of Macmillan.
The illustrations are diagrams, photographs and reproductions.
The [8] unnumbered pages contain the colour reproductions and are bound in between pp. 10 and 11.
1 –
Collagraph / Lift-ground / Photomechanical Etching
2 –
Copper / Zinc
3 –
Blind Embossment / Casting / Chine Collé / Ink / Paper / Press / Jigsaw Print / Printing à la Poupée / Multiple-plate Printing / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Digital Printmaking / Lithography / Screen Printing
5 –
Art Dealing / Collecting / Conservation and Restoration / Health and Safety
In: NCC; UBA; ULC.

272.5

The complete collagraph : the art and technique of printmaking from collage plates / John Ross, Clare Romano. - New York : Free Press : London : Collier Macmillan, cop. 1980. - 200, [16] p. : ill., partly in colour ; 32 cm.
Literature: p. 193.
ISBN 0-02-926770-6
NOT SEEN
In: BL; LC; NCC.

Ross (Tim)
See: **Ross** (John) & **Romano** (Clare) [No. 272.2].

Rothe 1 (Richard)   273
Einfache Drucktechniken für Schule und Haus (Heimatbilderbücher) / Richard Rothe. - Wien ; Leipzig ; New York : Deutscher Verlag für Jugend und Volk, 1925. - 114, [2] p. : 155 Abb. ; 22.5 cm. - (Bücherei der 'Quelle' ; 25).
MIP: pp. 81–104 : Abb. 125–145.
Contents: p. [2].
Stocklist: backside cover.
§ Title means: Simple printmaking techniques for school and home (home picture books)
1 –
Drypoint / Line Etching
2 –
Cardboard / Copper / Linoleum / Plastic / Zinc
3 –
Paper / Press / Printing in Black / Rubbing
In: UBAB.

Radierung auf Presspan / Richard Rothe. - Wien ; Leipzig : Deutscher Verlag für Jugend und Volk, [cop. 1929]. - 32 p. : 30 Abb. ; 23 cm. - (Gestaltende Arbeit ; 5).
Advertisement: backside cover.
With literature.
§ Title means: Etching on Preßspan
The *Abbildungen* are reproductions.
The title cites *Presspan* but in the main text it is always spelled *Preßspan*.
1 –
Drypoint
2 –
Cardboard
3 –
Paper / Press / Printing in Black / Rubbing
In: DBI-VK; ÖNB; Priv.Coll.

Wir drucken. Praktisches Handbuch mit 30 verschiedenen Drucktechniken für Schule, Heim und Hobby / Peter Rottmeier. - [1st ed.]. - Liestal : Schweizerischer Verein für Handarbeit und Schulreform ; Zell : Zürcher Kantonale Mittelstufenkonferenz, 1989. - 144 p. : [127] Bildern ; 30.5 cm. - (Bausteine für das Werken).
Contents: p. 7.
MIP: pp. 122–125 : [7] ill.
List of illustrations: p. 142.
ISBN 3-908236-07-X
§ Title means: We print. Practical manual with thirty different printmaking techniques for schools, at home and hobby
The epilogue is dated: 'Balterswil, Ende Juni 1983'.
Intended audience, p. 5: 'Der Anwendungsbereich liegt im Ermessen des Lehrers.'
Content keywords after the identical second edition.
1 –
Drypoint / Line Etching
2 –
Plastic
3 –
Paper / Printing in Black / Textile
4 –
Linocut / Nature Printing / Screen Printing / Woodcut
NOT SEEN
In: DNB-F; DBI-VK.

Wir drucken. Praktisches Handbuch mit 30 verschiedenen Drucktechniken für Schule, Heim und Hobby / Peter Rottmeier. - 2. Aufl. - Liestal : Schweizerischer Verein für Handarbeit und Schulreform ; Zell : Zürcher Kantonale Mittelstufenkonferenz, 1989. - 144 p. : [127] Bildern ; 30.5 cm. - (Bausteine für das Werken).
Contents: p. 7.
MIP: pp. 122–125 : [7] ill.
List of illustrations: p. 142.
ISBN 3-908236-07-X
In: DNB-F; DBI-VK.

La gravure au carborundum = Carborundum engraving / Maurice Rousseau-Leurent ; préface de Henri Goetz ; English translation by F. Voilley. - Villefranche-sur-mer : Nannini, 1991. - 31 p. : [15] photogr., [2] reprod. ; 21 cm.
Suppliers: p. 30.
§ The French text is printed in black and the English translation in blue ink on the same page.
The process is based on: **Goetz** (Paris 1969) [No. 123].
1 –
Aquatint / Carborundum Print / Collagraph
3 –
Multiple-plate Printing / Printing in Black / Printing Polychrome
In: Priv.Coll.

Instruccion para gravar en cobre, y perfeccionarse en el gravado à buril, al agua fuerte, y al humo, con el nuevo methodo de gravar las planchas para estampar en colores, à imitacion de la pintura; y un compendio historico de los mas célebres gravadores, que se han conocido desde su invencion hasta el presente / por Manuel de Rueda ; prólogo de Juan Carrete Parrondo. - Madrid : por Joachin Ibarra, 1761. - [32], 230 p. : 12 est. ; [15–17] cm.
MIP: pp. 1–192 : 12 est.
Addenda & corrigenda: p. [13].
Contents: p. [16].
§ Title means: Instruction for engraving in copper, and to make oneself perfect in the engraving with the burin, with strong water, and with soot, with the new method of engraving the plates for printing in colours, for the imitation of painting; and a historical compendium of the most

celebrated engravers

The *Estampas* are etchings.

The first three sections are largely based on **Bosse** (Paris 1745) [No. 42.8], the fourth section is based on **Le Blon** (Paris 1756) [No. 180.2].

Title description after: Palma de Mallorca 1990 [No. 277.2]; Granada 1991 [No. 277.3]. For a third reprint see: Valladolid 2001 [No. 277.4].

1 –

Line Engraving / Line Etching / Mezzotint

2 –

Copper

3 –

Multiple-plate Printing / Printing Polychrome

4 –

Art History

NOT SEEN

In: *Bigmore & Wyman 1880–1886*, 2: 278; BL; *Blas Benito 1994*: 71; BLBS; NUC–1956, vol. 509 (2×); BNM; *Figueras Ferrer 1992*: 1066; *Peddie 1962*, vol. 1; *Singer & Strang 1897*: no. 51.

277.2

Instruccion para grabar en cobre, y perfeccionarse en el grabado a buril, al aguafuerte, y al humo, con el nuevo método de grabar las planchas para estampar en colores, a imitación de la pintura / Manuel de Rueda ; prólogo de Juan Carrete Parrondo. - Ed. facsímil. - Palma de Mallorca : Ediciones 6a Obra Gràfica ; Madrid : Calcografía Nacional, 1990. - [22], [32], 230 p. : 12 reprod. ; 18 cm.

Literature: p. [21] at the beginning.

Addenda & corrigenda: p. [13].

Contents: p. [16].

MIP: pp. 1–192 : 12 reprod.

Edition: 1,000 copies.

ISBN 84-404-7318-4 (softcover)

§ Photomechanical reprint of: Madrid 1761 [No. 277.1]. Compare with the photomechanical reprint: Granada 1991 [No. 277.3], which is from the same edition, but from another copy; see p. [19] at the beginning.

The introduction outlines the position of Rueda's publication in comparison with other manuals on intaglio printmaking and relates it to the position of engraving in Spain in this period.

In: *Blas Benito 1994*: 71; Priv.Coll.

277.3

Instrucción para gravar en cobre / por Manuel de Rueda ; con estudio preliminar por Antonio Moreno Garrido. - Ed. facsímil. - Granada : Universidad, 1991. - LII, [4], [32], 230 p. : 12 reprod. ; 17 cm. - (Collección archivum ; 24).

Biography of Rueda: p. XXIII.

Literature: p. XLVIII.

Addenda & corrigenda: p. [13].

Contents: p. [16].

MIP: pp. 1–192 : 12 reprod.

Stocklist: back flap.

ISBN 84-338-1299-8 (softcover)

§ Photomechanical reprint of: Madrid 1761 [No. 277.1].

In: *Blas Benito 1994*: 71; BNL; BNM; DBI-VK; Priv.Coll.; RMA; ULC.

277.4

Instruccion para gravar en cobre, y perfeccionarse en el grabado a buril, al aguafuerte, y al humo, con el nuevo método de grabar las planchas para estampar en colores, a imitación de la pintura; y un compendio historico de los mas célebres gravadores, que se han conocido desde su invencion hasta el presente / por Manuel de Rueda ; prólogo de Juan Carrete Parrondo. - Ed. facsímil. - Valladolid : Maxtor, 2001. - [32], 230, [32] p. : Est. 2–12 ; 15 cm.

ISBD 84-95636-11-5

§ Photomechanical reprint of: Madrid 1761 [No. 277.1].

All reproductions bound at the back, *Estampa* 1 missing.

NOT SEEN

In: KVK.

Ruffer, (Józef)   278

Kwasoryt (akwaforta). Z podręczników francuskich zestawił / Józef Ruffer ; z załączeniem oryginalnej akwaforty Józefa Pankiewicza. - Kraków : R. Aleksandrowicza, 1909. - VIII [?], 55 p. : [5] ill., [1] etch. ; 21.5–22 cm.

Contents: p. VII.

Glossary: p. 55.

§ Title means: Etching. Compiled from French handbooks

The five illustrations – calque, etching plate, 1st to 3rd state – between pp. 5 and 6 are the same as in **Fraipont** (Paris 1897) [No. 108], fig. 23–27.

With an original etching by Józefa Pankiewicza.

The glossary is French–Polish.

Title description after photocopy.

1 –

Aquatint / Crayon Etching / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint

2 –

Copper / Steel / Steelfacing / Zinc

3 –

Ink / Paper / Parchment / Printing in Black

4 –

Troubleshooting
5 –
Art History
In: BNW.

Ruscelli (Girolamo)
See: **Alessio Piemontese** [No. 007].

<div align="right">**Russ** (Stephen)   279.1</div>

A complete guide to printmaking / Stephen Russ, Alan Cox, Trevor Allen, Jack Shirreff ; ed. by Stephen Russ. - London : Nelson, 1975. - 152 p. : [138] ill., of which [9] in colour ; 24.5 cm.
Contents: p. 5.
MIP: Etching and engraving / by Jack Shirreff. - P. 100–133 : [29] ill., of which [2] in colour.
Literature: p. 144.
Suppliers: p. 146.
Index: p. 150
ISBN 0-17-141037-8 (hardcover)
§ The illustrations are diagrams, photographs, reproductions and tables.
Title description after partial photocopy.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Photomechanical Etching / Relief Etchings / Soft-ground
2 –
Aluminium / Copper / Steel / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Printing in Black / Printing Polychrome
4 –
Lithography / Photography / Screen Printing / Woodcut
In: BL; *Blas Benito 1994*: 87; ULC.

<div align="right">279.2</div>

A complete guide to printmaking / Stephen Russ, Alan Cox, Trevor Allen, Jack Shirreff ; ed. by Stephen Russ. - New York : Viking Press, 1975. - 152 p. : [138] ill., of which [9] in colour ; 25 cm. - (A studio book).
Contents: p. 5.
MIP: Etching and engraving / by Jack Shirreff. - P. 100–133 : [29] ill., of which [2] in colour.
Tables on mordants: p. 112.
Literature: p. 144.
European suppliers: p. 146.
American suppliers: p. 148.
Index: p. 150.
SBN 670-23422-2
§ The illustrations are diagrams, photographs, reproductions and tables.
Intended audience, p. 7: 'This is a workshop handbook for the artist printer.'
In: NGMA; OCLC.

S

Sacilotto (Deli)
See: **Saff** (Donald) **& Sacilotto** (Deli) [No. 282].

<div align="right">**Sadler** (John)   280</div>

[Notebook] / John Sadler. - [Liverpool], [c. 1780?]. - [1] vol. ; […] cm.
§ Manuscript.
Language: English.
Griffiths 1987, p. 268: 'there is a very interesting entry describing a method of aquatinting in the notebook of John Sadler, the Liverpool pioneer of transfer printing. It is not dated, but by comparing the handwriting with other dated entries, it seems to belong to the later 1770s or very early 1780s. The recipe is peculiar, requiring a mixture of sand and resin; after being fused to the plate the sand is washed off. Unfortunately the next page with the continuation has been torn out, and no aquatints by Sadler seem to be known.'
1 –
Aquatint
NOT SEEN
In: CRL, Local Studies Section; *Griffiths 1987*: 268.

<div align="right">**Saez de Alamo** (Maria Concepcion) 281</div>

Aportaciónes al grabado a color en talla a traves del proceso de la zieglerografia / Maria Concepcion Saez de Alamo ; [prenten en tekeningen door Maria Concepcion Saez de Alamo]. - Bilbao : Caja de Ahorros Vizcaína, Departamento Cultural, 1989. - 132 p. : 22 fig., of which [3] in b/w ; 21 cm. - (Grabados & dibujos : historia, crítica, técnica).
Contents: p. 11.

Literature: p. 129.

§ Title means: Contributions to intaglio engraving in colour by means of the zieglergraphy process

Title on cover: El grabado en color por zieglerografia

Title means: Engraving in colour with zieglergraphy

The preface is dated, p. 10: 'Salamanca, junio de 1988'.

The *figuras* are three diagrams in b/w and reproductions in colour.

1 –

Soft-ground

2 –

Copper

3 –

Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing Polychrome

4 –

Troubleshooting

5 –

Aesthetics / Art History

In: BNM; RMA.

Saff (Donald) **& Sacilotto** (Deli)   282

Printmaking : history and process / Donald Saff, Deli Sacilotto ; ed. Rita Gilbert; picture ed. Joan Curtis ; project ed. Elisa Adams ; ms. ed. Elisa Adams, Eric Zafran ; ill. Abe Markson, Jim Bolles. - New York [etc.] : Holt, Rinehart and Winston ; Fort Worth [etc.] : Harcourt Brace Jovanovich College Publishers, cop. 1978. - xii, 436 p. : 675 b/w fig., 40 colour pl. ; 28–28.5 cm.

Contents: p. xi.

MIP: pp. 87–178 : b/w fig. 134–297, colour pl. 15–18.

List of papers: p. 373.

Conservation: p. 395.

The chemistry of etching: p. 406.

Steelfacing: p. 409.

Presses: p. 411.

Suppliers: p. 419.

Literature: p. 422.

Glossary: p. 425.

Index: p. 431.

ISBN 0-03-042106-3 (hardcover)

ISBN 0-03-085663-9 (softcover)

§ The preface is dated, p. x: August 1977.

Although the copyright is dated '1978', the book was probably reprinted again and again.

Intended audience, p. vii: 'This book is planned for students of printmaking at the college or university level, as well as for the general reader who wishes to explore the challenging medium of multiples. It will also serve as a basic resource book for the professional printmaker.'

1 –

Aquatint / Collagraph / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground

2 –

Aluminium / Brass / Copper / Magnesium / Steel / Steelfacing / Zinc

3 –

Blind Embossment / Chine Collé / Ink / Jigsaw Print / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing

4 –

Lithography / Screen Printing / Woodcut / Wood Engraving

5 –

Art History / Conservation and Restoration / Health and Safety

In: BL; *Blas Benito 1994*: 87; BNM; DBI-VK; MMW; NCC; Priv.Coll. (3×); RAA (2×); SKI; TUD; UBA; UBM; ULC.

Sallberg (Harald)   283.1

Konstgrafiska metoder / Harald Sallberg ; fuoretal Albert Engström. - Stockholm : Albert Bonniers Förlag, cop. 1927. - 66, [1] p. : [36] ill. ; [c. 20] cm.

List of illustrations: p. 63.

Index: p. 64.

Contents: p. [1].

§ The foreword is dated, p. 5: 'Stockholm i oktober 1927. Albert Engström'.

Minna Sora, correspondence in 2004: 'the original Swedish version was widely used in Sweden, and in Finland it was the only more thorough (80 pages) manual until the year 1978'. Cf.: **Blom** (Rauma 1922, 2nd ed. 1924]) and **Pietilä** (Jyväskylä 1978).

Title description after a photocopy and information kindly supplied by Minna Sora.

1 –

Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint

2 –

Brass / Copper / Iron / Zinc

3 –

Paper / Printing in Black

5 –

Lithography / Monotype

In: BIBSYS; HELKA; LIBRIS (12×).

Taidegrafiikan menettelytapoja / Harald Sallberg ; tekijän luvin suomentanut [= transl. into Finnish by] Erkki Kulovesi ; [preface by] Albert Engström. - [2nd ed.]. - Helsinki : Suomen graafilliset taiteilijat, 1937. - 80 p. : [36] ill. ; [c. 23] cm.

List of illustrations: p. 76.

Index: p. 77.

Contents: p. 80.

§ Title means: Procedures of the art of printmaking

The preface by the translator is dated, p. 6: 'Helsingissä 30 p:nä iokakuuta 1936. Erkki Kulovesi'.

The four figures that accompany the paragraph on *retroussage* (pp. 61–66, fig. 1–4) are different from the figures in the original Swedish text.

Title description after a photocopy and information kindly supplied by Minna Sora.

In: HELKA (6×).

Salmon (William) 284.1

Polygraphice : or the art of drawing, engraving, etching, limning, painting, washing, varnishing, colouring and dying. In three books: I, shews the drawing of men and other animal creatures, landskips, countries, and figures of various forms, II, the way of engraving etching and limning with all their requisits and ornaments, III, the way of painting, washing, varnishing, colouring and dying acoording to the method of the best authors now extant, exemplified in the painting of the antients, washing of maps, globes or pictures, dying of cloth, silks, bones, wood, glass, stones, and metals, together with the way of varnishing thereof according to any purpose or intent : the like never yet extant / by W[illiam] S[almon]. - [1st ed.]. - London : for Richard Jones, 1672. - [10], 293, [1] p. : front., ill. ; 15 cm.

§ BL, NLA (microfilm): 'The dedication signed "W. Salmon"'. NLA (microfilm): 'Printed by E.T. and R.H. for Richard Jones. Added t.p. engraved [= front.]. Advertisement on p. [1] [= at the back]'.

Levis 1912, suppl. p. 9, reproduces the frontispiece and the title page: 'It is interesting to compare this frontispiece with the one shown on page 33 belonging to "The Excellency of the Pen and Pencil".' The composition of the frontispiece of Polygraphice is partly in reverse after the frontispiece of **Excellency** (London 1668) [No. 098].

Apparently Salmon, and books of its kind, were used in the American colonies.

NOT SEEN

In: BL (2× inc.); NUC–1956; OCLC; ULC; *Wing 1972–1988*: no. S444.

284.2

Polygraphice : or the arts of drawing, engraving, etching, limning, painting, washing, varnishing, gilding, colouring, dying, beautifying and perfuming. In four books. Exemplifyed, in the drawing of men, women, landskips, countries, and figures of various forms; The way of engraving, etching and limning, with all their requisites and ornaments; The depicting of the most eminent pieces of antiquities; The paintings of the antients; Washing of maps, globes, or pictures; The dying of cloth, silk, horns, bones, wood, glass, stones, and metals; The varnishing, colouring and gilding thereof, according to any purpose or intent; The painting, colouring and beautifying of the face, skin and hair; The whole doctrine of perfumes (never published till now,) together with the original, advancement and perfection of the art of painting / by William Salmon. - The second ed., with many large additions: Addorned with sculptures [= plates]: The like never yet extant. - London : for Richard Jones ; printed by E.T. and R.H., 1673. - [10], 352, [8] p. : front., ill. ; 18 cm.

§ BL has two issues: 'sig. B. is of a different setting from the preceding and the illustrations vary. An additional plate has been inserted to face p. 62'. NLA (microfilm), NUC–1956, *Wing*: 'By E.T. and R.H. for Richard Jones'; *Wing*: 'By E.T. and R.H. for John Crumpe'.

NOT SEEN

In: BL (2×); NUC–1956; OCLC; *Wing 1972–1988*: nos. S445, S445A.

284.3

Polygraphice : or the arts of drawing, engraving, etching, limning, painting, washing, varnishing, gilding, colouring, dying, beautifying and perfuming. In four books. Exemplified, in the drawing of men, women, landskips, countries, and figures of various forms; The way of engraving, etching and limning, with all their requisites and ornaments; The depicting of the most eminent pieces of antiquities; The paintings of the antients; Washing of maps, globes, or pictures; The dying of cloth, silk, horns, bones, wood, glass, stones, and metals; The varnishing, colouring and gilding thereof, according to any purpose or intent; The painting, colouring and beautifying of the face, skin and hair; The whole doctrine of perfumes (never published till now,) together with the original, advancement and perfection of the art of painting. To which is added, a discourse of perspective and chiromancy / by William Salmon ; [William Sherman fe., William Vaughan sculp., Frederick Hendrick van Hove fec.]. - The third ed., with many large additions: Adorned with sculptures [= plates]: The like never yet extant. - London : printed by Andr. Clark, for John Crumpe, 1675. - [8], 407 [+1], [16] p. : front., [16] pl. ; 19 cm.

MIP: pp. 51–73.

Contents: p. [1] at the back.

Index: p. [4] at the back.

Addenda & corrigenda: p. [16] at the back.

§ For the larger part based on works by other authors, p. [7] at the beginning: 'In the composure of this work (besides our own observations) we have made use of the best authors now extant ...' For etching Salmon probably used Faithorne's translation of Bosse; **Bosse** (London 1662).

The engraver Frederick Hendrick van Hove was also known as Frederick Hendrick van den Hooven.

The third edition is augmented, p. [8] at the beginning.

The frontispiece is dated: 'London 1675'.

NLA (microfilm): 'Printed by Andr. Clark for John Crumpe'.

1 –

Line Engraving / Line Etching

2 –

Copper

In: BL; NUC–1956; OCLC; RMA; ULC; *Wing 1972–1988*: no. S446.

284.4

Polygraphice : or, the arts of drawing, engraving, etching, limning, painting, washing, varnishing, gilding, colouring, dying, beautifying and perfuming ... To which is added, a discourse of perspective and chiromancy / by William Salmon. - The fourth ed., with many new and large additions: Adorned with sculptures [= plates]: The like never yet extant. - London : for John Crumpe and to be sold by Charles Passenger, 1678. - [5], 407, [16] p. : front., pl., portrait ; 18–19 cm.

MIP: pp. 51–73.
Contents: p. [1] at the back.
Index: p. [4] at the back.
Addenda & corrigenda: p. [16] at the back.
§ BL: 'With an additional titlepage, engraved, dated 1675.'
In: BL; NUC–1956; OCLC; ULC; VU; *Wing 1972–1988*: no. S447.

<div align="right">284.5</div>

Polygraphice : or the arts of drawing, engraving, etching, limning, painting, washing, varnishing, gilding, colouring, dying, beautifying and perfuming. In four books. Exemplifyed in the drawing of men, women, landskips, countreys, and figures of various forms, the way of engraving, etching and limning, with all their requisites and ornaments, the depicting of the most eminent pieces of antiquities, the paintings of the antients, washing of maps, globes, or pictures, the dying of cloth, silk, horns, bones, wood, glass, stones and metals, the varnishing, colouring and gilding thereof according to any purpose or intent, the painting, colouring and beautifying of the face, skin and hair, the whole doctrine of perfumes, never published till now, together with the original, advancement and perfection of the art of painting. To which is added a discourse of perspective and chiromancy / by William Salmon. - The fifth ed., with many large additions: Adorned with sculptures [= plates]: The like never yet extant. - London : for John Crumpe, 1681. - [10], 407, [17] p. : front., ill. ; 19 cm.
§ BL: frontispiece is dated 1675.
NLA (microfilm): 'Printed by M. White for John Crumpe. [15] leaves of plates'.
NOT SEEN
In: BL (2×); NUC–1956; OCLC; *Wing 1972–1988*: no. S447A.

<div align="right">284.6</div>

Polygraphice : or, the arts of drawing, engraving, etching, limning, painting, washing, varnishing, gilding, colouring, dying, beautifying and perfuming : in seven books : exemplified in the drawing of men, women, landskips, countreys and figures of various forms, the way of engraving, etching and limning, with all their requisites and ornaments, the depicting of the most eminent pieces of antiquities, the paintings of the antients ... : never published til now, together with the original, advancement and perfection of the art of painting, and a discourse of perspective, chiromancy and alchymy. To which also is added, I, The one hundred and twelve chymical arcanums of Petrus Johannes Faber, a most learned and eminent physician, transl. out of Latin into English, II, An abstract of choice chymical preparations, fitted for vulgar use, for curing most diseases incident ot humane bodies / by William Salmon ; [William Sherman fe., William Vaughan sculp., Frederick Hendrick van Hove fec.]. - The fifth ed., enl. with above a thousand considerable additons, adorned with XXV copper sculptures [= plates]: The like never yet extant. - London : for Thomas Passenger and Thomas Sawbridge, 1685. - [64], 767, [1] p. : front., XXIII pl., portrait ; 17.5–19 cm.
Addenda & corrigenda: p. [64].
§ NLA (microfilm): 'Advertisement on p. 764–767. Includes the "Arcanums of Peter John Faber" as liber sextus'.
Reprint: New York 1979 [No. 284.8].
NOT SEEN
In: BL; BNP; MET; NUC–1956; OCLC; ULC (2×); *Wing 1972–1988*: no. S448.

<div align="right">284.7</div>

Polygraphice : or, the arts of drawing, engraving, etching, limning, painting, vernishing, japaning, gilding, &c. In two volumes. Containing, I. The arts of drawing men, women, landskips, &c. II. Of engraving, etching, and limning. III. Of painting, washing, coloring, gilding. IV. Of the original, advancement and perfection of painting, with the various paintings of the Ancients. V. Of the arts of beautifying and perfuming. VI. Of the arts of dying and staining. VII. Of alchymie, and the grand elixer of philosophers. VIII. Of the 112 chymical arcana of Peter Faber. IX. Of chiromantical signatures. X. Of staining and painting glass, enamel and gems. XI. Of vernishing, japaning, and gilding / by William Salmon ; [portrait engr. by Michiel van der Gucht]. - The eighth ed. Enl., with above five hundred considerable additions thro' the whole work; and the addition of almost five whole books, not in any of the former impressions. - London: printed for A. and J. Churchill, and J. Nicholson, 1701. - [32], 939, [1] p. : portrait, front., XXIII pl. ; 20–20.5 cm.
Addenda & corrigenda: p. [14].
Contents: p. [15].
List of symbols for weights: p. [32].
MIP: pp. 69–90, 220–221, 931–936.
Advertisement: p. 939, p. [1] at the back.
§ The recipe for an etching ground 'from Rinebrant'(p. 77) and the description of the mezzotint technique (p. 220) probably after **Browne 2** (London 1669) [No. 049]: 106 and 110 respectively.
Postscript dated, p. [14]: 'From my House at Black-Fryers Stairs, London. 24 October. 1700. William Salmon.'
Continuous paging over two volumes. The NSUG copy bound as one volume. Other (ULC): vol. 1: [32], 224 p.; vol. 2: 301–939, [1] p. Text and index are paged continuously.
Prints I–XXIII in the NSUG copy bound together after the text.
BCIN: 'this was used in the American colonies'.
1 –
Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Hand-colouring / Print behind Glass
4 –
Woodcut
In: BCIN; BL (3×); BNP; ESTC: no. t149640; LC; NLA; NSUG; NUC–1956; ULC.

<div align="right">284.8</div>

Polygraphice. Selections. On the gilding & dying of paper, &c. : an excerpt from William Salmon's Polygraphice (1685). - New York : Book Arts Press, School of Library Service, Columbia University, 1979. - 15 p. : paper sample (1 leaf) ; 21 cm.
§ Title page verso: 'the eighth in a series of pamphlets'.
Does not contain any information on intaglio printmaking.
Colophon: 'This pamphlet was hand-set ... during the months of February–April 1979 ... by members of the 2nd semester Descriptive Bibliography

class.'
Reprint of: London 1685 [No. 284.6].
NOT SEEN
In: ULC.

[Copy of a letter written to John Clerk of Eldin] / Paul Sandby. - [London], [1775]. - [1] fol. ; […] cm.
§ Manuscript.
Language: English.
The letter is not dated, but followed soon after another letter of 8 September 1775.
Sandby produced series of prints with his liquid-grain aquatint process.
Title description after: 1933 [No. 285.2].
1 –
Aquatint / Line Etching / Soft-ground
2 –
Brass / Copper / Iron
NOT SEEN
In: V&A.

285.2

Letters from Paul Sandby to John Clerk of Eldin / Martin Hardie.
In: Print Collectors' Quarterly. - Vol. 20 (1933). - P. 362–364.
MIP: pp. 363–364.
§ Contains a transcription of two letters by Sandby. The first one of 8 September 1775 [No. 285.1] refers to aquatint, without giving any technical details, but see: **Sandby 2** (London 1801) [No. 286]. Sandby gave scarcely more information about aquatint in the second letter written shortly afterwards other than mentioning brushing brass and iron plates with acid, but instead he described the soft-ground technique. Clerk had more success with Robert Adam who sent him instructions for dust-grain aquatint, see: **Adam** (London 1782) [No. 004].
In: RMA; UBL-KHI.

A model of imitating drawings on copper plates discovered by P[aul] Sandby, R.A. in the year 1776, to which he gave the name of aquatinta / [after Paul Sandby]. - [London], [1801].
§ Manuscript.
Language: English.
Paul Sandby was the inventor of the liquid-grain aquatint process. He never published his process but was careful to share his knowledge on the process with others, see: **Sandby 1** (London 1775) [No. 285].
Title description after: 1987 [No. 286.2].
1 –
Aquatint / Lift-ground
2 –
Copper
NOT SEEN
In: BL, Add. Mss. 36994, fol. 117–119; *Hind 1963-1*: 303, n. 3.

286.2

Notes on early aquatint in England and France / Antony Griffiths.
In: Print quarterly. - Vol. 4 (1987), no. 3 (Sep.). - P. 269–273.
MIP: pp. 269–270.
§ Contains a transcription of the manuscript with Sandby's instructions for his liquid-grain aquatint technique.
In: HAB; KB; RMA.

Sánchez Cantón (Francisco Javier)
See: **García Hidalgo** (José) [No. 115].

The excellency of graving and etching, in copper or wood with the manner of printing those pieces in several colours / William Sanderson.
§ Not published, although announced in: Graphice. The use of the pen and pensil. Or, the most excellent art of painting: in two parts / by William Sanderson. - London : printed for Robert Crofts, 1658, p. [6]. 'And for the Art of Painting in Glasse, as also the excellency of Graving and Etching, in Copper or Wood with the manner of Printing those Pieces in several colours, may soon be made publick, as this Book finds acceptance'.
The title may perhaps be related to: **Excellency** (London 1668) [No. 098].
NOT PUBLISHED

Der teutschen Academie / Joachim von Sandrart. - Nürnberg (etc.), 1675–1679. - 2 vol. : ill. ; 37.5 cm.
§ Photomechanical reprint: Nördlingen 1994–1995 [No. 288.6].
– Vol. 1: L'Academia todesca della architectura, scultura & pittura: oder teutsche Academie der edlen Bau- Bild- und Mahlerey-Künste: darinn enthalten ein gründlicher Unterricht, von dieser dreyer Künste Eigenschaft, Lehr-Sätzen und Geheimnißen, von den Bau-Steinen und fünferley Bau-Arten, von den Statuen und ihrer Zugehör, von der Erfind- und Zeichnung, von Maaß und Proportion der Leiber, vom Fresco- Stein- Landschaft- Bild- und Historien-Mahlen, von Nacht-Stücken, vom Mahlen mit Oel und Wasser-Farben, von den Affecten und Gewändern, von der Perspectiv, und vom Mahl-Zimmer, auch von den Farben, deren Gebrauch, Ursprung, Natur und Bedeutung: durch langen Fleiß und Erfahrung ergriffen, und auf inständiges Erinnern hoher und vornehmer Personen, allen Kunst- und Tugend-Liebenden zu Ehren und Nutzen; neben aller Egyptischen, Grichischen, Römischen, Italiänischen,

Hoch- und Nieder-Teutschen, auch anderer alten und neuen Virtuosen, Leben und fürnehmsten Kunst-Werken, beschrieben / durch Joachim von Sandrart aus Stockau. - Nürnberg : bey Jacob von Sandrart ; Frankfurt [am Main] : Matthaeus Merian ; gedruckt bey Johann-Philipp Mittenberger, 1675. - [8], 106, [2], 376, [12], 24 p. : front, 38, 68, 74, 180 etch. & engrav., some woodcuts ; 37.5 cm.
MIP: Vom Kupfer-Stechen und der Etz-Kunst. - Vol. 1, book 2, pp. 49–52.
§ Figures: 'mit 38 Platten von der Architectur, 68 alt-römischen Statuen, ganz und halben Bildern, 74 Medaglionen, 180 Contrafäten, durch die hand der bästen heutigen Künstlere, in Kupfer gezieret'. The plates are printed separately and bound with the texts, the woodcuts are printed within the text. Von Sandrart was a fairly accomplished draughtsman and etcher himself; some of the etchings in his books are by his own hand.
– Vol. 2: Der teutschen Academie zweyter und letzter Haupt-Theyl, von der edlen Bau- Bild- und Mahlerey-Künste : darinnen begriffen ein vollkommener Unterricht, von dieser dreyen Künste Eigenschafften, Lehr-Sätzen und Geheimnißen; von der Architectur und Bau-Art; von der Bild-Sculptur oder Stein-Bildung, und ihrer Zugehör; von der Zeichen-Kunst Vollkommenheit … durch 73 Figuren in Kupfer vorgestellt; wie auch der Bildhauer-Kunst vortrefflichste 50 antiche oder alte Statuen/ mit ihren Regeln beschrieben; folgends die 12. erste Römische Käyser, mit 80 antiche basso relieven oder nieder-erhobnen Bildungen, und derer geheimen Auslegungen; Ingleichen der Edlen Mahler-Kunst noch übriger berühmter neuer Meistere, Conterfäte … Hernach eine Auslegung der Wandlungs-Gedichte des Ovidius; und letzlich Eine recht-eigendliche Abbildung der berühmtesten alten Ruinen, Gebäuen, Geschirren oder Gefässen und Hörnern / durch Joachim von Sandrart. - Nürnberg : in Verlegung des Authoris ; Frankfurt : Michael und Johann Friedrich Endter und Johann von Sandrart ; Nürnberg : gedruckt durch Christian Sigismund Froberger, 1679. - [10], 100, [2], 91, [3], [2], 96, [2], 174, [4] p. : 73, 50, 12, 80 etch. and engr. ; 37.5 cm.
§ Also published: Leiptzig ; Nürnberg : Funck ; Riegel, 1679.
Without any information on manual intaglio processes.
1 –
Line Etching
2 –
Copper
5 –
Art History
In: KB; RMA.

288.2

Academia nobilissimae artis pictoriae: sive de veris & genuinis hujusdem proprietatibus, theorematibus, secretis atque requisitis aliis; nimirum de inventione, delineatione, eurythmia & proportione corporum; de picturis in albario recente, sive fresco, in tabulis item, atque linteis … ; de subactu colorum oleario & aquario, de affectibus & perturbationibus animi experimendis; de lumine umbra; de vestibus, deque colorum proprietate, efficacia, usu, origine, natura atque significatione instructio fundamentalis; … una cum artificum tam Aegyptiorum, Graecorum & romanorum; quam Italorum, Gallorum … aliorumque, sive antiquorum, sive modernorum … tabulis aeneis eleganter exhibitis … at[que] publicata … [etc.] / Joachim de Sandrart. - Noriberga [etc.] : Sumtibus autoris ; Noribergae : Froberg [printer?], 1683. - [18], 402, [10], 16 p. : ill. ; 2º.
§ Seems to be an extract of the 1675–1679 edition.
The illustrations are largely portraits.
NOT SEEN
In: KVK.

288.3

Von der Hoch-Teutschen berühmten Mahler, Bildhauer und Baumeister Leben und Lob / von Joachim von Sandrart. - Neudr. - Frankfurt am Main : Frankfurter Verlagsanstalt, 1925. - 72 p. : 5 Taf. ; 8º. - (Kleine Schriften zur Kunst ; 4).
§ Selection of the biographical part of the ed.: Nürnberg 1675.
Without the information on intaglio printmaking.
NOT SEEN
In: KVK.

288.4

Joachim von Sandrarts Academie der Bau-, Bild- und Mahlerey-Künste von 1675 : leben der berühmten Maler, Bildhauer und Baumeister / hrsg. und kommentiert von A[rthur] R[udolf] Peltzer. - München : Hirth, cop. 1925. - 445 p. : 140 ill. ; 30 cm.
§ Summarised translation into modern German of the biographical parts of the ed.: Nürnberg 1675.
Without the information on manual intaglio processes.
Photomechanical reprint: Farnborough 1971 [No. 288.5].
In: KB; RMA; UBL-KHI.

288.5

Joachim von Sandrarts Academie der Bau-, Bild- und Mahlerey-Künste von 1675 : leben der berühmten Maler, Bildhauer und Baumeister / hrsg. und kommentiert von A[rthur] R[udolf] Peltzer. - Repr. - Farnborough (Hants.) : Gregg, 1971. - 445 p. : 140 ill. ; 24 cm.
ISBN 0-576-15988-3
§ Also published as: Westmead 1971.
Photomechanical reprint of: München 1925 [No. 288.4].
Without the information on manual intaglio processes.
NOT SEEN
In: KVK.

288.6

Teutsche Academie der Bau- Bild- und Mahlerey-Künste / Joachim von Sandrart. - [Photomech. repr.]. - Nördlingen : Uhl, 1994–1995. - 3 vol. : ill. ; 38 cm + map.
ISBN 3-921503-79-5 (hardcover)
§ Photomechanical reprint of: Nürnberg 1675–1679 [No. 288.1].
– Vol. 1: Einführung in die Neuausgabe Christian Klemm. - 1994. - [c. 500 p.].
MIP: I Theils II buch, Das VI Capitel Vom Kupfer-Stechen und der Etz-Kunst. - Fol. Eijr-Eiijv, pp. 49–52
– Vol. 2: Von der Bau- Bild- und Mahlerey- Künste. Zweiter Hauptteil. - 1994. - [c. 320 p.].
– Vol. 3: Die ikonographischen Schriften / mit einer Einleitung von Jochen Becker. - 1995. - [c. 330 p.].
In: KVK; KB.

Praktisches Handbuch für Zeichner, Kupferstecher, Illuministen, Kupferdrucker und Kunstliebhaber / gesammelt und hrsg. von Christoph Friedrich Theodosius von Schad. - Augsburg ; Nürnberg ; Leipzig : in commission bey Friedrich Leopold Supprian, 1800. - [4], 150, [10] p. : [front.?] ; [c. 18?] cm.

MIP: pp. 1–14, 40–50, 54–55, 59–61, 62, 70–71, 73–74, 78, 99–101, 103–105.

Addenda & corrigenda: p. [1] at the back.

Contents: p. [3] at the back.

§ Title means: Practical handbook for draughtsmen, engravers, illuminators, plate printers and art lovers

The *impressum* is not clear; perhaps Von Schad himself was the publisher and Supprian took the book as a commission. The text of the *impressum* is: 'Augsburg und Nürnberg, und in Commien in Leipzig bey Friedrich Leopold Supprian. 1800.'

The preface is dated, p. [4]: 'Geschrieben zu Leipzig, im Monat Julius 1799'.

Singer & Strang: 'Mit Dürers Portrait als Titelvignette'. Such a vignette or frontispiece is not present on the microfilm that is used for the title description.

1 –

Line Engraving / Line Etching

2 –

Copper / Glass / Stone

3 –

Counterproof / Hand-colouring / Ink / Paper / Print behind Glass / Printing in Black / Printing à la Poupée / Printing Polychrome / Relief Printing

4 –

Drawing / Painting

5 –

Conservation and Restoration

In: GV 1700–1910, vol. 123: 335, col. 2; *Singer & Strang 1897*: no. 80; UBLz.

Der künstlerische Tiefdruck : für Anfänger und Fortgeschrittene / Günter Schäfer. - Tübingen : Narr, 1987. - 122, [1] p. : 67 ill. ; 28–29 cm.

Contents: p. 7.

Literature: p. 117.

Glossary: p. 118.

Stocklist: p. [1].

ISBN 3-87808-871-X (softcover)

§ The illustrations are diagrams and reproductions.

1 –

Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving

2 –

Brass / Copper / Plastic / Zinc

3 –

Multiple-plate Printing / Printing in Black / Printing Polychrome

In: DNB-F; DBI-VK; DNB-L; Priv.Coll.; UBH.

Ausführliche Anleitung zur Restauration vergelbter, fleckiger und beschädigter Kupferstiche u.s.w. nebst einer kurzen Beschreibung der verschiedenen Arten des Kupferstichs, sowie des Holzschnittes und der Lithographie und einem Verzeichniss vorzüglicher Kupferstecher und Lithographen, ihrer bedeutendsten Werke und der Maler oder Zeichner nach welchen jene gearbeitet haben / von J[oseph] Fr[ederick] [August] Schall. - Leipzig : Rudolph Weigel, 1863. - 93 p. ; 21–23 cm.

MIP: pp. 28–45.

List of prints in the collection of Schall: p. 49.

List of painters mentioned in the list of prints: p. 87.

With literature.

§ Primarily a manual on print conservation, but with detailed information on intaglio printmaking.

The preface is dated, p. 5: 'Breslau, 1863'.

Schall wrote this manual at the age of 78 (p. 5) on the basis of forty years of experience with the conservation of thousands of prints (p. 4).

Intended audience, p. 4: 'Kupferstichsammler und Liebhaber'.

1 –

Aquatint / Electrolytic Etching / Line Engraving / Line Etching / Mezzotint

2 –

Copper

4 –

Lithography / Woodcut

5 –

Art History / Conservation and Restoration

In: CCB; HAB; HAUM; *Hind 1963-1*: 397; MAK 1883: 292; RMA; SBB; UBLz; UBH.

Vad är grafik? En handbok i grafisk konst / Philip von Schantz ; foto av verkstadsbilderna Harry Dittmer. - [1st ed.]. - Stockholm : Aldus/Bonniers, 1966. - 125, [3] p. : [77] ill. ; 18.5 cm. - (Aldusbok : A 171).

Contents: p. 7.

MIP: pp. 17–76 : [49] ill.

Glossary & index: p. 115.

Literature: p. 125.
§ Title means: What is a print? A handbook for the graphic arts
The preface is dated, p. 5: 'Stockholm i april 1966, Philip von Schantz'.
Editions 1–6 seem identical – only the cover picture differs.
It was the author's intention to compile a book that was both an overview of printmaking techniques for the print lover, as well as a manual and recipe book for practising printmakers (p. 5). Intaglio printmaking is discussed in detail, the other printmaking techniques more superficially.
Title description after photocopy.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint
2 –
Brass / Copper / Steel / Zinc
3 –
Multiple-plate Printing / Press / Printing in Black / Retroussage / Steelfacing / Printing Polychrome
4 –
Monotype / Linocut / Lithography / Photography / Relief Printing / Screen Printing / Woodcut / Wood Engraving
5 –
Art History / Conservation and Restoration / Original and Reproduction
In: LIBRIS; LINDA.

292.2

Vad är grafik? : en handbok i grafisk konst / Philip von Schantz. - [2nd ed.]. - Stockholm : Aldus/Bonnier, 1970. - 125 p. : ill. ; […] cm. - (Aldusbok ; 171).
NOT SEEN
In: LIBRIS.

292.3

Vad är grafik? : en handbok i grafisk konst / Philip von Schantz. - [3rd ed.]. - Stockholm : Aldus, 1975. - 127 p. : ill. ; […] cm. - (Aldusbok ; 171).
NOT SEEN
In: LIBRIS.

292.4

Vad är grafik? : en handbok i grafisk konst / Philip von Schantz. - [4th ed.]. - Stockholm : Bonnier, 1978. - 127, [1] p. : ill. ; […] cm. - (Aldusserien).
ISBN 91-0-040560-4
NOT SEEN
In: LIBRIS; LINDA.

292.5

Vad är grafik? : en handbok i grafisk konst / Philip von Schant. - [5th ed.]. - Stockholm : Bonnier, [c. 1980?]
NOT SEEN

292.6

Vad är grafik? : en handbok i grafisk konst / Philip von Schant. - [6th ed.]. - Stockholm : Bonnier, 1984. - 127, [1] p. : ill. ; […] cm. - (Aldusserien).
ISBN 91-34-50399-4
NOT SEEN
In: LIBRIS; LINDA.

292.7

Vad är grafik : en handbok i grafisk konst / Philip von Schantz, Jordi Arkö. - [7th ed.]. - Stockholm : Bonnier Alba, 1996. - 159, [1] p. : ill. ; […] cm.
ISBN 91-34-51261-6
§ This edition seems to be augmented.
NOT SEEN
In: LIBRIS; LINDA.

Schellenberg (Johann Rodolf)   293.1

Kurze Abhandlung über die Aetzkunst / von J[ohann] Rod[olf] Schellenberg. - Winterthur : in der Steinerischen Buchhandlung [ook: Steiner], 1795. - I–VI, [1], 7–51 p. : [1] title vign., 1 Tab. ; 17.5 cm.
Reference: p. III.
§ Title means: Brief manual on etching
Intended audience, p. IV: 'jungen Anfängern'.
Title description after: Marburg an der Lahn 1988 [No. 293.2].
1 –
Drypoint / Line Etching
2 –
Copper
3 –
Ink / Paper / Press / Printing in Black
NOT SEEN
In: *Börsenverein 1885*; BN; NUC–1956; SBB; *Singer & Strang 1897*: no. 74; ZBZ.

293.2

Kurze Abhandlung über die Aetzkunst / Johann Rudolf Schellenberg ; Einführung von Brigitte Thanner ; Vorwort von Armin Geus. - Faksimiledruck. - Marburg an der Lahn : Basilisken-Presse, 1988. - 47, I–VI, [2], 8–51 p. : [1] title vign., 1 Tab. ; 20.5 cm. - (Basilisken-Druck ; 7).
Endnotes: p. 39 at the beginning.
Literature: p. 43 at the beginning.
Edition: nos. 1–400 (trade edition), nos. I–C (not for trade).
ISBN 3-925347-05-4 (hardcover)
§ The introduction is about Schellenberg and his manual.

Photomechanical reprint of the edition: Winterthur 1795.
The preface is dated, p. 6 at the beginning: 'Marburg an der Lahn, Mai 1988'.
In: ABK; DNB-F; DBI-VK; KSM; Priv.Coll. (2×); RMA; UBH.

Schiessl (Ulrich)
See: **Cröker** (Johann Melchior) [No. 068.8].

Schober (Lieselotte)   294.1

Die Radierung und ihre Technik. Von der Platte zum Druck / Lieselotte Schober ; Zeichnungen, Otto Sturmberg ; Werkfotos, Erwin Schimitschek. - [1st ed.]. - Göttingen ; Frankfurt (Main) ; Zürich : Muster-Schmidt, cop. 1974. - 96 p. : front., [101] ill., of which [11] in colour ; 25.5 cm.
Contents: p. 5.
Index & glossary: p. 87.
List of illustrations: p. 95.
Literature: p. 96.
ISBN 3-7881-5106-4 (hardcover)
§ Title means: Etching and its technique. From plate to print
The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Relief Etching / Soft-ground
2 –
Copper / Zinc
3 –
Blind Embossment / Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Troubleshooting
5 –
Art History / Conservation and Restoration
In: DNB-F; DBI-VK; NCC; OBDH; OCLC; SBB; UBH.

294.2

Die Radierung und ihre Technik. Von der Platte zum Druck / Lieselotte Schober ; Zeichnungen, Otto Sturmberg ; Werkfotos, Erwin Schimitschek. - 2. verbesserte und erweiterte Aufl. - Göttingen ; Frankfurt (Main) ; Zürich : Muster-Schmidt, 1979. - 112 p. : front., [122] ill., of which [13] in colour ; 25 cm. - (Grosses Muster-Schmidt-Studiobücher ; 6).
Contents: p. 5.
Index & glossary: p. 98
List of illustrations: p. 110.
Literature: p. 112.
ISBN 3-7881-5109-9 (hardcover)
§ The illustrations are diagrams, photographs and reproductions.
In: DNB-F; DBI-VK; DNB-L.

294.3

Die Radierung und ihre Technik. Von der Platte zum Druck / Lieselotte Schober ; Zeichnungen Otto Sturmberg ; Werkfotos Erwin Schimitschek. - 3. neu bearbeitete und erweiterte Aufl. - Göttingen ; Frankfurt (Main) ; Zürich : Muster-Schmidt, 1986. - 112 p. : front., [122] ill., of which [13] in colour ; 25.5 cm.
Contents: p. 5.
Index & glossary: p. 97.
List of illustrations: p. 110.
Literature: p. 112.
With literature.
ISBN 3-7881-5109-9 (hardcover)
§ With the prefaces of the 1st and the 2nd editions (p. 7).
The illustrations are diagrams, photographs and reproductions.
In: DNB-F; DBI-VK; DNB-L; OBDH; OCLC; Priv.Coll.; UBL.

294.4

Die Radierung und ihre Technik. Von der Platte zum Druck / Lieselotte Schober ; Zeichnungen Otto Sturmberg ; Werkfotos Erwin Schimitschek. - 4. neu bearbeitete und erweiterte Aufl. - Göttingen ; Zürich : Muster-Schmidt, 1998. - 116 p. : front., [122] ill., of which [18] in colour ; 25 cm.
Contents: p. 5.
Index & glossary: p. 97.
List of illustrations: p 114.
Literature: p. 116.
ISBN 3-7881-5109-0 (hardcover)
§ With a new preface (p. 7), which is a compilation of the prefaces of the 1st and the 2nd editions.
The *Fachwortverzeichnis* (Index & glossary) has been reset with an extra four pages.Texts and illustrations have been slightly adapted.
The illustrations are diagrams, photographs and reproductions.
In: DNB-F; NSUG; Priv.Coll.; UBH.

Scholz (Anna M.)   295

Die Radierung. Kleines Werkstattbuch / Anna M. Scholz. - Kirchensittenbach : AMS-Verlag, 1986. - 29 p. : [1] diagram ; 21 cm.
Contents: p. 3.
Literature: pp. 5, 29.

ISBN 3-9801235-0-2 (softcover)
§ Title means: Etching. Small manual
Intended audience, p. 5: 'Dieses Werkstattbuch ... wurde verfaßt, um in Volkshochschulkursen und anderen Einrichtungen der Erwachsenenbildung den fachlichen Unterricht zu begleiten'.
1 –
Aquatint / Drypoint / Mezzotint / Lift-ground / Line Etching / Soft-ground
2 –
Copper / Plastic / Zinc
3 –
Printing in Black / Press
In: DNB-F; DBI-VK; Priv.Coll.

<div style="text-align: right">School of arts improv'd   296.1</div>

The school of arts improv'd; or companion for the ingenious. Containing I. drawing; painting in oil and water colours; gilding, etching, engraving, painting upon glass, and bronzing. II. The arts of painting or staining glass and marble. Of staining wood, ivory, bones, horn, paper, parchment, &c. III. Dying linen, woolen, silk, leather, &c. IV. Of casts and impressions from figures, busts, medals, leaves, &c. V. The whole art of pyrotechny or fire-works. VI. The art of making porcelain after the chinese manner. With a great variety of other curious particulars, equally instructive and amusing / compiled from various authors. - Gainsborough : printed by John Mozley, 1776. - [2], 156 p. ; 19 cm.
Contents: p. [2].
MIP: pp. 56–67.
§ Text largely derived from **Bowles** (London 1760) [No. 045]. The text on intaglio printmaking is almost identical to the edition **Bowles** (London 1760–1770), without the information on suppliers and without one paragraph (Bowles, p. 67: 'Another method used ... as before directed').
Almost identical text in: **The school of wisdom and arts** (York 1776) [No. 297]. Since both publications are printed by John Mozley it seems that he prepared two variations. The same text also in: **Dougall** (Manchester 1801) [No. 296].
1 –
Drypoint / Line Engraving / Line Etching / Mezzotint
2 –
Copper
5 –
Aesthetics
In: BL (2×); NUC–1956; OCLC; ULC.

<div style="text-align: right">296.2</div>

The school of arts improv'd: or companion for the ingenious. Containing I. drawing; painting in oil and water colours; gilding, etching, engraving, painting upon glass, and bronzing. II. The arts of painting or staining glass and marble. Of staining wood, ivory, bones, horn, paper, parchment, &c. III. Dying linen, woolen, silk, leather, &c. IV. Of casts and impressions from figures, busts, medals, leaves, &c. V. The whole art of pyrotechny or fire-works. VI. The art of making porcelain after the Chinese manner. With a great variety of other curious particulars, equally instructive and amusing / compiled from various authors. - Calcutta : […], 1830. - [3], 156 p. ; 8°
NOT SEEN
In: NUC–1956.

<div style="text-align: right">School of wisdom and arts   297.1</div>

The school of wisdom : or repository of the most valuable curiosities of art and nature ... [etc.] / compiled from various authors. - York : sold by Etherington ; Gainsborough : printed by J. Mozley, [1776?]. - XII, 324 p. ; 18 cm.
§ Probably issued in 1776; see the annotation with the following title description.
NOT SEEN
In: NUC–1956.

<div style="text-align: right">297.2</div>

The school of wisdom : or repository of the most valuable curiosities of art and nature ... [etc.] / compiled from various authors. - London: sold by J.F. and C. Rivington ; Gainsborough : printed by J. Mozeley [sic!], 1776. - XII, 324 p. ; 17.5 cm.
§ Probably issued by both the Rivingtons and for Etherington in the same year.
NOT SEEN
In: NUC–1956.

<div style="text-align: right">297.3</div>

The school of wisdom and arts; being a complete repository of what is most curious in art and nature. Containing, I. A survey of man, with sublime reflections on his most noble part, the soul. II. A particular description of the structure of the human body; and the wonderful properties of the eye described. III. Astronomy, oratory, politeness, and morality. IV. A review of the creation, viz. birds, beasts, fishes, and insects; their industry, sagacity, &c. V. Of the globe; gravity, air, light, sound, water, clouds, rain, hail and snow, with their properties and use. VI. Nations compared with each other. VII. Drawing; painting in water and oil colours; gilding, etching, engraving, painting upon glass, and bronzing. VIII. Dying silk, linnen, woolen and leather. IX. Impressions from figures, busts, casts, medals, leaves, &c. X. The arts of painting marble and glass; of staining wood, bones, horn, ivory, paper, parchment, &c. XI. The whole art of pyrotechny or fire-works. XII. The art of making porcelain after the chinese manner, with many curious particulars, equally amusing and instructive to the ingenious / compiled from different authors. - Berwick : printed for William Phorson, 1783. - I–iv, I–viii, 5–339 p. ; 17.5–18 cm.
Contents: p. i (second paging in Roman numerals).
MIP: pp. 249–259.
§ The text on intaglio printmaking almost identical to the edition **Bowles** (London 1760) [No. 045], without the information on suppliers and without one paragraph (Bowles, p. 67: 'Another method used ... as before directed').
Almost identical text in: **School of arts improv'd** (Gainsborough 1776) [No. 296]. Since both publications are printed by John Mozley it seems that he prepared two variations. The same text also in: **Dougall** (Manchester 1801) [No. 081].
1 –
Drypoint / Line Engraving / Line Etching / Mezzotint

2 –
Copper
5 –
Aesthetics
In: *Levis 1912*: 89; NUC–1956; OCLC.

Schoonebeek (Adriaan)298.1

Korte maniere om op een gemakkelijke wijze de ets-konst te leeren / Adriaan Schoonebeek. - Amsterdam, 1698. - P. 7–26 : [18] drawings ; 20 cm.
§ Title means: Short manner to learn etching in an easy manner
Manuscript.
Language: Dutch.
Covers all aspects of etching up to plate printing.
The introduction is dated, p. 3: 'uijt amsterdam desen 1 jan S V 1698'. 'S V' is *Stili Veteris*, the old style; following the calendar reform this is ten days later, thus Schoonebeek wrote on 10 January 1698 according to the modern calendar.
Title description after prints from microfilm.
1 –
Line Etching
2 –
Copper
In: LAS, Q no. 196, inv. no. PIB 154 (cat. pp. 255–256).

298.2

Adriaan Schoonebeek's etching manual (1698) : edition, translation, comments / Frans A. Janssen, Huigen Leeflang, Adri Markus, Ad Stijnman.
In: Quaerendo. - Vol. 40 (2010). - P. 87–165 : 14 pl., 18 fig.
MIP, modern English translation: pp. 140–155 : 18 fig.
MIP, original text: pp. 158–164.
Legenda: p. 164.
§ The 18 figures reproduce the drawings in the manuscript.
Review: N.M. Orenstein, 'Earliest Dutch etching manual', in *Print Quarterly*, 28 (2001) 1: 56–57.
In: HAB; KB; Priv.Coll.; UBA.

Schraner (Hans)   299

Mit Messer, Stichel und Stift. Eine Einführung in die Technik des Holzschnittes, des Kupferstiches und der Radierung / von Hans Schraner ; Textzeichnungen vom Autor. - Aarau ; Frankfurt am Main : Sauerländer, 1952. - 111 p. : [55] diagrams, [6] reprod. ; 21.5 cm.
Contents: p. 5
MIP: pp. 42–111 : [34] diagrams, [4] reprod.
§ Title means: With knife, burin and needle. An introduction in the techniques of woodcut, engraving and etching
1 –
Drypoint / Line Engraving / Line Etching / Mezzotint
2 –
Aluminium / Bronze / Copper / Lead / Zinc
3 –
Hand-colouring / Paper / Printing à la Poupée / Printing in Black / Printing Polychrome
In: UBAB.

Schwarz (Paul Wolfgang)   300

Neue und gründliche Art die Aqua-tinta oder Tuschmanier auf das Geschwindeste ohne alle Unterweisung für sich zu erlernen / durch mehrjährige Erfahrungen geprüft und hrsg. von Paul Wolfgang Schwarz. - Nürnberg ; Sulzbach : in der Johann Esaias Seidelschen Kunst- und Buchhandlung, 1805. - [4], 97, [1] p. : front., VI Tab. ; 19 cm.
Contents: p. [3].
Address of planisher: p. 96.
Supplier: p. 97.
Addenda & corrigenda: p. [1] at the back.
Specimens: Tab. VI.
With literature.
§ Title means: New and thorough manner to learn by oneself the aquatinta manner quickly and without teaching
The *Tabellen* are etchings with aquatint. Frontispiece and *Tabellen* V and VI are printed in brown ink, the others in black ink.
1 –
Aquatint / Line Etching
2 –
Copper
3 –
Paper / Printing in Black / Printing Monochrome
In: BL; BLBS; BN; *Börsenverein 1885*; BS ('Nicht mehr vorhanden'); DBI-VK; NUC–1956; RMA; *Schießl 1989*: no. 707; *Singer & Strang 1897*: no. 86.

Schwegman 1 (Hendrik)   301

Berigt. Wegens de uitvinding om een tekening op een kopere plaat overtebrengen, aan den oeconomischen tak van de Hollandsche Maatschappye der Weetenschappen, te Haarlem / ingeleverd door H[endrik] Schwegman. - Haarlem : by C. Plaat en A. Loosjes Pz., [1793]. - 8 p. ; 22 cm. - (Nuttige voorstellen ; 1).
With literature.
§ Title means: Notice. Because of the invention of how to transfer a drawing to a copper plate, to the economical branch of the Dutch Scientific

Society
1 –
Line Etching
2 –
Copper
5 –
Original and Reproduction
In: KB; NCC; RKD; UBG; UBL.

Schwegman 2 (Hendrik)   302

Verhandeling over het graveeren in de manier van gewassen tekeningen of acquatinta, op twee verschillende wijzen / door H[endrik] Schwegman. - Haarlem : by A. Loosjes Pz., 1806. - 16 p. : 1 ill. ; 22 cm. - (Nuttige voorstellen ; 4).
With literature.
§ Title means: Treatise on the engraving in the manner of washed drawings or aquatint, in two different ways
1 –
Aquatint / Lift-ground / Crayon Engraving
2 –
Copper
5 –
Art History
In: BN; CCB; KB; KUB; NCC; *Singer & Strang 1897*: no. 87; UBG; UBL.

Scott (Paul) 303.1

Ceramics and print / Paul Scott. - London : A&C Black, 1994. - 128 p. : front., [112] ill., of which [24] in colour ; 23.5 cm. - (Ceramics handbooks).
Contents: p. 5.
MIP: pp. 55–66 : [12] ill., of which [2] in colour.
Glossary: p. 113.
Health and Safety: p. 118.
Suppliers: p. 124.
Literature: p. 126.
Index: p. 128.
ISBN 0-7136-3746-3 (softcover)
§ The illustrations are photographs and reproductions.
Review: J. Goddard, 'Ceramics and Print', in *Printmaking Today*, 4 (1995) 1: 19.
2 –
Blind Embossment / Paper Clay / Printing in Black
4 –
Ceramics / Decalcomania / Lithography / Monotype / Photography / Screen Printing / Stamping / Woodcut
5 –
Art History / Health and Safety
In: Priv.Coll.; ULC.

                                                              303.2

Ceramics and print / Paul Scott. - Philadelphia : University of Pennsylvania Press, 1995. - 128 p. : front., [112] ill., of which [24] in colour ; 23.5 cm. - (Ceramics handbooks).
Contents: p. 5.
MIP: pp. 55–66 : [12] ill., of which [2] in colour.
Glossary: p. 113.
Health and Safety: p. 118.
Suppliers: p. 124.
Literature: p. 126.
Index: p. 128.
ISBN 0-8122-1575-3 (softcover)
In: OCLC; UBH.

                                                              303.3

Ceramics and print / Paul Scott. - 2nd ed. - London : A&C Black ; Philadelphia : University of Pennsylvania Press, 2002. - 144 p. : front., ill., partly in colour ; 24 cm. - (Ceramics handbooks).
ISBN 0-7136-5485-6 (A&C Black, softcover)
ISBN 0-8122-1800-0 (University of Pennsylvania Press, softcover)
NOT SEEN
In: ULC.

                                                              303.4

Ceramics and print / Paul Scott. - 2nd [sic! = 3rd] ed. - London : A&C Black, 2005. - 160 p. : 100 ill., partly in colour ; 23.5 cm. - (Ceramics handbooks).
ISBN 0-7136-7491-1 (softcover)
ISBN 978-0-7136-7491-0 (softcover)
NOT SEEN
In: A&C Black catalogue.

                                                              303.5

Drucken auf Keramik / Paul Scott ; [transl. Ansgar Tolksdorf]. - Bern ; Stuttgart ; Wien : Haupt, 2002. - 144 S. : Ill. ; 24 cm. - (Keramik-Studio).
3–258–06263–3 (softcover)
NOT SEEN

In: DNB-F; DNB-L.

303.6

Cerámicas y técnicas de impresión / Paul Scott ; versión castellana de Maite Igartua ; revisión técnica de María Antonia Casanovas. - Barcelona : GG, cop. 1997. - 127 p. : [113] ill., of which [23] in colour ; 23.5 cm. - (Manuales de Cerámica).
Contents: p. 5.
MIP: pp. 55–66 : [12] ill., of which [2] in colour.
Glossary: p. 113.
Health and Safety: p. 118.
Literature: p. 124.
Contents: p. 126.
ISBN 84-252-1707-5 (softcover)
§ Translation of the edition: London 1994.
Without the list of suppliers and some other minor differences.
The publisher 'GG' is: Editorial Gustavo Gili.
In: Priv.Coll.

Sculptura historico-technica   304.1

Sculptura historico-technica: or the history and art of ingraving. Containing, I. The rise and progress of ingraving. II. Of ingraving in general. III. An idea of a fine collection of prints. IV. The repertorium; or collection of the various marks and cyphers, by which the prints of the best ingravers, &c. are distinguished. With large additions. V. Of ingraving, etching, and scraping on copper, as now practised, with cuts to illustrate it / extracted from Baldinucci, Florent le Comte, Faithorne, the Abcedario Pittorico, and other authors. - [1st ed.]. - London : printed for S[amuel?] Harding, 1747. - xii, 1–112, [1], 112–225, [1] p. : 195 engravers' marks, 10 pl. ; 16.5–17 cm.
Contents: p. ix.
MIP: pp. 15–45, 163–225 : 10 pl.
Engravers' marks: pp. 73–112 : 195 fig.
List of artists' initials: p. [1] middle–p. 123.
Index on artists' personal names: pp. 124–147.
Index on artists' surnames: pp. 148–162.
Stocklist: p. [1] at the back.
§ This is not a practical instructive manual, but nevertheless it is included in the present bibliography because it is closely related to the works by Browne, Evelyn and Faithorne. The sources mentioned on the title page are: Cominciamento, e progresso dell'arte dell intagliare in rame, colle vite di molti de'piu eccellenti maestri della stessa professione / Filippo Baldinucci. - Firenze : stamperia di P. Matini, 1686; **Le Comte** (Paris 1699–1700) [No. 181], for the part on the appearance of engravings; Faithorne (see **Bosse** (London 1662)) [No. 042.29], for intaglio printmaking techniques. The 'Repertorium' (Part IV) is the re-edition of the translation of the mentioned *Ab[e]cedario pittorico* or: Repertorium sculptile-typicum ... [etc.] / Pellegrini Antonio Orlandini. - London : Sam. Harding, 1730. For the title, the reference to mezzotint and the history of prints the compiler based himself on **Evelyn** (London 1662) [No. 097.2]. The final paragraph on mezzotint (p. 225) is copied almost literally after **Browne 2** (London 1669) [No. 049]: 110.
The technical part, after Faithorne, is not so much intended for practical instructions, but more as a description of printmaking techniques for print lovers: pp. iiI–iv.
A second volume with biographies of engravers was planned, but never appeared, p. iv.
ESTC: 'Signature F has an additional leaf'. This extra folium is p. 111–[1], which is pasted to p. 110.
The engravers' marks are woodcuts.
Intended audience, p. 15: 'My intention, in treating of this noble and useful Art, is not so much to instruct the Masters of this Profession, as to inform the Lovers of it.'
1 –
Line Engraving / Line Etching / Mezzotint
2 –
Copper
3 –
Aesthetics / Art History / Collecting
In: *Bigmore & Wyman 1880–1886*, 2: 332; BL (2×); BLBS; *Bridson & Wakeman 1984*: no. B4; ESTC: no. t084861 (25×); HAB; *Hind 1963-1*: 398; *Levis 1912*: 17–19, 37; NUC–1956, vol. 535 (8×); OCLC; *Peddie 1962*, vol. 2; *Singer & Strang 1897*: no. 40; ULC.

304.2

Sculptura historico-technica: or the history and art of ingraving. Containing. I. The rise and progress of ingraving. II. Of ingraving in general. III. An idea of a fine collection of prints. IV. The repertorium; or collection of the various marks and cyphers, by which the prints of the best ingravers, &c. are distinguished. With large editions. V. Of ingraving, etching, and scraping on copper, as now practised, with cuts to illustrate it / extracted from Baldinucci, Florent le Comte, Faithorne, the Abcedario Pittorico, and other authors. - [2nd ed.]. - London : […], [1758?].
§ According to *Bridson & Wakeman* there is a 2nd ed. of 'c. 1768' and a 3rd ed. of '1766'. An edition dated '1768' was not found by me and not seen by *Bridson & Wakeman* ('Notes based on the 3rd. & 4th. edns.'). Perhaps they mean 1758. ESTC does not have this edition. *Singer & Strang*: 's.a. sed c. 1758'. Not likely a 'ghost', because the 1766 edition is the 'third edition'.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B4; *Singer & Strang 1897*: no. 48.

304.3

Sculptura historico-technica: or, the history and art of engraving. Containing, I. The rise and progress of engraving. II. Of engraving in general. III. Of engraving, etching, and scraping on copper, as now practised. IV. An idea of a fine collection of prints. V. The repertorium; or, a collection of various marks and cyphers, with additions / extracted from Baldinucci, Florent le Compte, Fairthorne [sic!], the Abecedario Pittorico, and other authors. - The third [sic!] edition. To which is now added, a chronological and historical series of the painters from the eleventh century. - London : printed for J. Marks, 1766. - xi, [1], 264 p. : 10 pl., 202 engravers' marks and monograms ; 17–18 cm.
Contents: p. ix.
MIP: pp. 15–33, 47–109 : 10 etch.

Engravers' marks and monograms: p. 137.

List of initials: p. 179.

Chronology: p. 192.

List of engravers and painters: pp. 226, 250.

§ The chapters are in slightly different order and some monograms are added.

References to the appearance of the print and the quality of the copper after **Le Comte** (Paris 1699–1700) [No. 181]. The rest of intaglio printmakings is a full copy after Faithorne (**Bosse** (London 1662) [No. 042.29]) with slightly edited texts.

The marks and monograms are woodcuts. The plates are etchings copied after Faithorne. Pl. 6 is in reverse without text underneath, the upper part of pl. 7 is in reverse.

In: BL; *Bridson & Wakeman 1984*: no. B4; CCB; ESTC: no. t148066 (5×); *Levis 1912*: 37; NUC–1956, vol. 535 (3×); RKD; RMA; UBU.

<div align="right">304.4</div>

Sculptura historico-technica: or, the history and art of engraving. Containing, I. The rise and progress of engraving. II. Of engraving in general. III. Of engraving, etching, and scraping on copper, as now practised. IV. An idea of a fine collection of prints. V. The repertorium; or, a collection of various marks and cyphers, with additions / extracted from Baldinucci, Florent le Compte, Fairthorne [sic!], the Abecedario Pittorico, and other authors. - The fourth edition. To which is now added, a chronological and historical series of the painters from the eleventh century. - London : printed for J. Marks, 1770. - xi, [1], 264 p. : 10 pl., 202 marks and monograms ; 17–18 cm.

Contents: p. ix.

MIP: pp. 15–33, 47–109 : 10 etch.

Engravers' marks and monograms: p. 137.

List of initials: p. 179.

Chronology: p. 192.

List of engravers and painters: pp. 226, 250.

§ A re-edition with a new title page of the edition London 1766; notice the differences in chainline distances as compared to those of the text, while in the third edition the distances of chainlines of the paper of the title page and text are similar. Type and layout are identical, printing errors are the same, the watermarks (fleur-de-lis with 'I V' underneath) are the same although not identical (twinmarks).

In: *Bigmore & Wyman 1880–1886*, 2: 332; BL (3×); *Bridson & Wakeman 1984*: no. B4; CCB; ESTC: no. t085554 (33×); *Levis 1912*: 38; MET; NUC–1956, vol. 535 (16×); OCLC (6×); RMA; *Singer & Strang 1897*: no. 58; UBH.

<div align="right">**Seibold** (Alois Leopold) 305.1</div>

Die Radierung. Ein Leitfaden und Ratgeber / von Alois [Leopold] Seibold ; Orginal-Radierungen von Alois L[eopold] Seibold. - [1st ed.]. - Esslingen a.N. [= Esslingen am Neckar] : Neff, 1909. - [8], 92, [4] p. : 10 Abb., 2 Kunstbeilagen ; 19–20 cm.

Contents: p. [6].

Literature: p. 5 n.

Index: p. 87

§ Title means: Etching. A guide and advisor

The *Abbildungen* are diagrams, the two *Kunstbeilagen* are reproductions, a third reproduction is pasted to the front cover.

Some copies have an additional stocklist of [4] p. following p. 92.

Intended audience, p. [5]: 'Jüngern'.

Review: H.W. Singer, in *Deutsche Literaturzeitschrift*, 31: 2922–2923.

1 –

Aquatint / Line Etching

2 –

Copper / Steelfacing

3 –

Counterproof / Ink / Paper / Press / Printing in Black

4 –

Troubleshooting

5 –

Aesthetics

In: IBK 1978, 8 (1909): no. 2970, and 9 (1910): no. 2907; NUC–1956; SBB; UBAB (2×).

<div align="right">305.2</div>

Die Radierung. Ein Leitfaden und Ratgeber / von Alois [Leopold] Seibold ; Orginal-Radierungen von Alois L[eopold] Seibold. - Zweite, vermehrte und verbesserte Aufl. - Esslingen a.N. [= Esslingen am Neckar] : Neff, 1916. - [10], 100 p. : 16 Abb., VI Kunstbeilagen ; 19.5–20 cm.

Contents: p. [9].

List of reproductions: p. [10].

Literature: p. 4

Index: p. 92.

§ *Kunstbeilage* I is the frontispiece.

In: DBI-VK; DNB-L; HGKB; IBK 1978, 14 (1915–1916): no. 3189; NSUG; Priv.Coll.; SBB; UBH.

<div align="right">305.3</div>

Die Radierung. Ein Leitfaden und Ratgeber / von Alois [Leopold] Seibold ; Orginal-Radierungen von Alois L[eopold] Seibold. - Dritte, vermehrte und verbesserte Aufl. Esslingen a.N. [= Esslingen am Neckar] : Neff, 1920. - [12], 108 p. : front., 16 Abb., [9] Kunstbeilagen ; 19 cm.

Contents: p. [11].

List of reproductions: p. [12].

Literature: p. 5 n.

Index: p. 101.

§ The part on troubleshooting in **Ehrström** (Helsingors 1924) [No. 087]: 134–136, is translated after Seibold (seen 1920: 69–74), with references, while fig. 64 and 66 are also after Seibold (seen 1920: Abb. 1, 7).

1 –

Aquatint / Drypoint / Line Etching

2 –
Copper / Steelfacing / Zinc
3 –
Ink / Paper / Press / Printing in Black / Rubbing
4 –
Troubleshooting
5 –
Aesthetics / Conservation and Restoration
In: CCB; DBI-VK; NCC; NUC–1956; OBA; OCLC; UBA.

<div align="right">305.4</div>

Die Radierung. Ein Leitfaden und Ratgeber / von Alois [Leopold] Seibold ; Orginal-Radierungen von Alois L[eopold] Seibold. - Vierte, vermehrte und verbesserte Aufl. Esslingen a.N. - [= Esslingen am Neckar] a.N. : Neff, 1922. - [12], 108 p. : front., 16 Abb., [9] Kunstbeilagen ; 19 cm.
Contents: p. [11].
List of reproductions: p. [12].
Literature: p. 5 n.
Index: p. 100.
Stocklist: front- and back flaps.
In: ABK; DBI-VK; NUC–1956; OCLC (2×); Priv.Coll. (3×).

Self instructor
See: **Bowles** (Carington) [No. 045].

<div align="right">**Servolini** (Luigi)   306.1</div>

Incidere. Manuale pratico per apprendere xilografia, chiaroscuro, cromoxilografia (orientale ed occidentale), bulino, puntasecca, acquaforte, acquatinta, altri procedimenti calcografici, litografia artistica, autotipia, algrafia, cromolitografia, ecc. / Luigi Servolini. - [1st ed.]. - Torino : Lavagnolo, [1952]. - 190 p. : ill., partly in colour ; 25 cm.
§ 'Figure demonstrative, esempi di tecnica e di stile, ampio formulario, sommario storico, piccola antologia dell'incisione italiana antica e moderna'.
NOT SEEN
In: KVK; NUC–1956; OCLC; ÖNB.

<div align="right">306.2</div>

L'arte di incidere : manuale pratico per apprendere xilografia, chiaroscuro, cromoxilografia (orientale ed occidentale), bulino, puntasecca, acquaforte, acquatinta, altri procedimenti calcografici, litografia artistica, autotipia, algrafia, cromolitografia, ecc. / Luigi Servolini. - Seconda ed. riveduta. - Torino : Lavagnolo, 1961. - 197 p. : ill., [3] tav. in colour ; 24–25 cm.
§ The text is revised and some illustrations are added.
NOT SEEN
In: KVK; NUC–1956; OCLC.

<div align="right">306.3</div>

L'arte di incidere : manuale pratico per apprendere: xilografia, chiaroscuro, cromoxilografia (orientale ed occidentale), bulino, puntasecca, acquaforte, acquatinta, altri procedimenti calcografici, litografia artistica, autotipia, algrafia, cromolitografia, elementi di serigrafia, figure dimostrative, esempi di tecnica e di stile, ampio formulario, sommario storico, piccola antologia dell'incisione italiana antica e moderna / Luigi Servolini. - Terza ed. riveduta e ampliata. - Torino : Lavagnolo, 1971. - 232, [6] p. : [89] ill., A–D, XXII tav., of which [4] in colour ; 25 cm.
MIP: pp. 47–84 : [12] ill.
List of illustrations: p. 225.
Contents: p. 231.
Suppliers: p. [1].
List of publications by the author: p. [2].
Stocklist: p. [3].
§ The *Tavole* A–D are in colour.
Title description after microfilm.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Copper / Plastic / Steelfacing / Zinc
3 –
Paper / Press / Printing in Black
4 –
Linocut / Lithography / Screen Printing / Woodcut / Wood Engraving
5 –
Art History
In: BNCF.

<div align="right">**Sévy** (Pernelle)   307.1</div>

Imprimorama / Pernelle Sévy ; photogr. de François Cherrier. - Paris : Hachette, 1972. - 91 p. : [143] colour ill. ; 26 cm. - (Jeunesse 2000).
§ Title on the front cover: Imprimorama, trente-trois façons d'imprimer ... papiers de fête, tissus (etc.)
NOT SEEN
In: KVK.

<div align="right">307.2</div>

Drucken, ein künstlerisches Hobby : 33 kreative Möglichkeiten der Drucktechnik / Pernelle Sévy ; deutsche Bearbeitung Lilly Lattermann ; Fotos François Cherrier. - Esslingen [am Neckar] : Schreiber, 1975. - 92 p. : colour ill. ; 26 cm
NOT SEEN

In: KVK.

Imprimorama / Pernelle Sévy ; transl. Alicia Eisenberg. - [1st ed.]. - Valencia : Mas-Ivars, 1972. - 92 p. : colour ill. ; 27 cm.
ISBN 84-8514636-0
NOT SEEN
In: KVK.

Imprimorama / Pernelle Sévy ; transl. Alicia Eisenberg. - [2nd ed.]. - Valencia : Mas-Ivars, D.L. 1977. - 92 p. : colour ill. ; 27 cm
NOT SEEN
In: KVK.

Imprimorama / Pernelle Sévy ; transl. Alicia Eisenberg. - [3rd ed.]. - Valencia : Mas-Ivars, D.L. 1980. - 92 p. : colour ill. ; 27 cm
NOT SEEN
In: KVK.

Imprimorama / Pernelle Sevy ; fotografie di Francois Cherrier. - [1st ed.]. - Firenze : Giunti, 1973. - 92 p. : colour ill. ; 26 cm.
NOT SEEN
In: KVK.

Imprimorama / Pernelle Sevy ; fotografie di Francois Cherrier. - [2nd ed.]. - Firenze : Giunti Marzocco, 1977. - 92 p. : colour ill. ; 26 cm.
NOT SEEN
In: KVK.

Fun with printing / by Pernelle Sévy ; photogr. by François Cherrier ; transl. by Ruby McMillan. - London (etc.) : Angus & Robertson, cop. 1975. - 91 p. : front., [143] colour ill. ; 26 cm. - (Family crafts).
Contents: p. 4.
MIP: pp. 88–91 : [4] ill.
Titles in the series: backside cover.
ISBN 0-207-95537-9 (hardcover)
§ Title on cover: Fun with printing. Thirty-three ways of making prints
Intended audience, front cover: 'Family crafts'
1 –
Aquatint / Drypoint / Line Engraving / Line Etching
2 –
Copper
3 –
Casting
4 –
Monotype / Nature Printing / Screen Printing / Woodcut
In: Priv.Coll.

Seward (Coy Avon)
See: **Lankes** (Julius John) [No. 179].

Shirreff (Jack)
See: **Russ** (Stephen) [No. 279].

On the making of etchings / by Frank Short ; [etch. by Wilfrid Ball, Frank Short] ; [diagrams by Frank Short?]. - [1st ed.]. - London : Dunthorne, 1888. - [4], 34 p. : IV pl., [1] vignet, [13] diagrams ; 21.5 cm.
List of illustrations: p. 3.
§ Pl. I, II and IV are etchings. Pl. III contains eleven specimens of the techniques discussed in this manual. Pl. I is printed in brown ink.
Pl. II is dated: 'July 1884'. Pl. IV is dated: 'Anno dom. 1888'.
1 –
Aquatint / Crayon Engraving / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Iron / Steel / Steelfacing / Zinc
3 –
Printing in Black
In: BL; *Blas Benito 1994*: 71; BLBS (inc.); *Bridson & Wakeman 1984*: no. B34; *Levis 1912*: 108; MET; NUC–1956; OCLC (27×); RMA; *Singer & Strang 1897*: no. 352.

On the making of etchings / by Frank Short ; [etch. by Wilfrid Ball, Frank Short] ; [diagrams by Frank Short?]. - [Deluxe ed.]. - London : Dunthorne, 1888. - [4], 34 p. : IV pl., [1] vign., [13] diagrams ; 23 cm.
Edition: 150 copies.
§ Pl. I, II and IV are etchings. Pl. III contains eleven specimens of the techniques discussed in this manual. Pl. I is printed in brown ink.
Deluxe edition printed on heavy wove paper and bound in parchment. Pl. 1 is signed in pencil by Wilfrid Ball, pl. II and IV by Frank Short.
In: BL; LC; OCLC; Priv.Coll.

On the making of etchings / by Frank Short ; [etch. by Wilfrid Ball, Frank Short] ; [diagrams by Frank Short?]. - Repr. - London : Dunthorne, [1889] . -

[4], 34 p. : IV pl., [1] vign., [13] diagrams ; 23 cm.
§ Pl. I, II and IV are etchings. Pl. III contains eleven specimens of the techniques discussed in this manual. Pl. I is printed in brown ink.
Trade ed.
In: BL (?); *Levis 1912*: 108; Priv.Coll.

308.4

On the making of etchings / by Frank Short ; [etch. by Wilfrid Ball, Frank Short] ; [diagrams by Frank Short?]. - 2nd ed. - London : [Dunthorne?], 1893. - 34 p. : 4 pl. ; […] cm.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B34; *Levis 1912*: 108.

308.5

On the making of etchings / by Frank Short ; [etch. by Frank Short?] ; [diagrams by Frank Short?]. - 3rd ed. - London : [Dunthorne?], 1898. - 43 [sic!] p. : 4 pl., ill. ; 22 cm.
§ NUC–1956: 'pref. 1898'.
Levis: 'different plates but similar marginal illustrations'.
NOT SEEN
In: BL; BLBS; *Bridson & Wakeman 1984*: no. B34; *Levis 1912*: 108; NUC–1956; OCLC.

Shrubsole (W.G.)   309.1

Etching, its principles and practice. A book for students and amateurs / W.G. Shrubsole. - [1st ed.]. - London : Rowney, 1870. - 68 p. : front., [1] etch., [3] ill. : 18–19 cm. - (George Rowney & Co's Treatises on the Fine Arts ; 28).
§ The frontispiece is an etching. The etchings are printed in brown.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B 24; *Levis 1912*: 105.

309.2

Etching, its principles and practice. A book for students and amateurs / W.G. Shrubsole. - Second ed. - London : George Rowney, 1889. - 68, 20 p. : [2] fol. of pl. ; 18–19 cm.
§ *Bridson & Wakeman*: '2nd edn., 18?; 3rd edn., [1889]'.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B24; BL; BLBS; NUC–1956; OCLC (3×).

309.3

Etching, its principles and practice. A book for students and amateurs / W.G. Shrubsole. - Third ed. - London : Rowney, [c. 1905]. - 68, 16 p. : front., [1] etch., [3] ill. : 18.5 cm.
Contents: p. 3.
Literature: pp. 67–68.
Advertisement: p. 1, at the back.
List with titles in the series: p. 16 at the back.
§ Contains the preface of the second edition of 1889, dated, p. 6: 'Manchester, February, 1889'.
Intended audience, p. 5: 'This little book is intended, as set forth in the title, for students and amateurs.'
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Soft-ground
2 –
Copper / Steelfacing
3 –
Printing in Black
5 –
Aesthetics
In: BL; BLBS.

Shure (Brian)   310.1

Chine collé: a printer's handbook / Brian Shure. - San Francisco : Crown Point Press, 2000. - 128 p. : [123] ill. ; 22 × 22 cm.
Contents: p. 8.
Literature: p. 122.
Suppliers: p. 125.
Index of artworks: p. 126.
Index of photographs: p. 127.
ISBN 0-891300-15-6 (softcover)
§ Review: A. Griffiths, 'Chine collé', in *Print Quarterly*, 18 (2001) 2: 214–215.
Review: S. Hoskins, 'Chine collé', in *Printmaking Today*, 11 (2002) 1: 20.
3 –
Chine Collé / Multiple-plate Printing / Paper / Printing in black / Printing Polychrome / Textile
4 –
Troubleshooting
5 –
Art History
In: Priv.Coll.

310.2

Magical secrets about chine collé : pasting, printing, mounting and leafing step-by-step / by Brian Shure. - [2nd ed.]. - San Francisco : Crown Point, 2009. - 197 p. : ill. + 1 DVD-ROM ; 25.5 cm.
ISBN 1-89130-023-7
ISBN 978-1-89130-023-3

NOT SEEN
In: KVK.

Etching methods and materials : a new and simplified technique / by Wilson Silsby. - New York : Dodd, Mead, 1943. - xiv, 114 p. : front., [55] ill. ; 23.5 cm.
Contents: p. xi.
List of illustrations: p. xiii.
§ The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Drypoint / Lift-ground / Line Etching / Soft-ground
2 –
Aluminium / Copper / Iron / Plastic / Zinc
3 –
Printing in Black / Multiple-plate Printing / Ink / Paper / Press / Printing à la Poupée / Printing Polychrome
5 –
Health and Safety
In: NUC–1956; OCLC (24×); Priv.Coll.

Prírucka umělce-grafika : o technikách rytiny, leptu a barevného leptu / T[omas] František Šimon. - Praha : Jan Štenc, 1921. - 91, [3] p. : front., [51] ill., of which [4] in colour ; 19.5–20 × 19.5–20 cm.
Stocklist: p. [2].
With literature.
§ Title means: Manual of the artist-printmaker : on the techniques of engraving, etching and coloured etching
Some catalogues give the following title: Příručka pro malíře-grafika, rytina, lept a barevný lept. This title means: Manual for the painter-printmaker, engraving, etching and colour-etching. Perhaps this is the cover title.
The frontispiece is an etching.
Title description after photocopy, copies of the cover missing.
1 –
Aquatint / Crayon Engraving / Drypoint / Échoppe / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Copper / Zinc
3 –
Hand-colouring / Ink / Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Monotype
5 –
Art History
In: BL; MET; NUC–1956; OCLC (2×).

[Technika leptu] / Jaroslav Skrbek. - Praha : [Jaroslav Skrbek?], 1937. - [24] p. : [11] photogr., [1] reprod. ; 20 cm.
§ Title means: Technique of etching
There is no title page.
Perhaps privately published.
1 –
Line Etching
2 –
Copper / Zinc
3 –
Printing in Black
5 –
Art History
In: RMA.

Etching : a guide to traditional techniques / Alan Smith ; foreword Chris Orr. - Ramsbury : Crowood, 2004. - 160 p. : [165] colour ill. ; 27 cm.
Contents, p. 5.
Glossary: p. 152.
Suppliers: p. 155.
List of printmaking studios: p. 157.
Index: p. 159.
ISBN 1-86126-597-2 (hardcover)
§ The preface is dated, p. 7: 'September 2003'.
The illustrations are photographs and reproductions.
Review: S. Mumberson, in *Printmaking Today*, 13 (2004) 4: 30.
1 –
Aquatint / Crayon-etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
3 –

Copper / Steel / Zinc
3 –
Chine Collé / Counterproof / Ink / Multiple-plate Printing / Paper / Printing à la Poupée / Printing in Black / Printing Polychrome / Viscosity Colour Printing
5 –
Art History / Health and Safety
In: Priv.Coll.

Techniques in etching using brass / documented by Paul Smith ; original prints by Paul Smith. - Sydney : Sydney College of the Arts Press, 1983. - XV, [1], 30 p. : IX, A-C, IV fig., 30 prints, of which [12] in colour ; 25.5 × 25.5 cm.
Contents: p. V.
Edition: 30 numbered copies.
ISBN 0-908231-40-7 (hardcover)
§ The figures are diagrams.
The prints show specific etching printing proceses and therefore are specimens.
Intended audience, p. III: 'This text is written for students who are familiar with the etching process.'
P. II: 'There is a limited edition of thirty copies containing original prints, handbound in leather, numbered and signed by Paul Smith.'
1 –
Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Brass
3 –
Blind Embossment / Chine Collé / Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
5 –
Health and Safety
In: NLA; OCLC.

The artist's handbook : the complete, practical guide to the tools, techniques and materials of painting, drawing and printmaking / Ray Campbell Smith. - London : Dorling Kindersley, 1987. - 352 p : ill., mainly in colour ; 25 cm.
Contents: p. 4 [?].
Glossary: p. 338.
Literature: p. 344.
Index: p. 348.
ISBN 0-86318-208-9 (hardcover?)
NOT SEEN
In: KVK.

The artist's handbook : the complete, practical guide to the tools, techniques and materials of painting, drawing and printmaking / Ray Campbell Smith. - London : Dorling Kindersley, 2003. - Rev. and enl. ed. - 384 p. : ill., mainly in colour ; 27 cm.
ISBN 0-7513-6439-8 (hardcover)
NOT SEEN
In: BL; BLO; ULC.

Politikens kunstnerhåndbog / Ray Campbell Smith ; transl. and ed. Thomas Holst. - 1. udgave, 1. oplaga. - Kjøbnhavn : Politiken, 1988. - 352 p. : ill. ; 25 cm. - (Politikens håndbøger)
§ Cover title: Materialer, teknikker og redskaber til maleri, tegning og grafik
NOT SEEN
In: KBK.

Politikens kunstnerhåndbog / Ray Campbell Smith ; oversat fra engelsk af Niels Møller … [et al.]. - 1. udgave, 2. oplag. - Kjøbnhavn : Politiken, 1991. - 352 p. : ill., mainly in colour ; 25 cm. - (Politikens håndbøger)
§ Cover title: Materialer, teknikker og redskaber til maleri, tegning og grafik
NOT SEEN
In: KBK.

Politikens kunstnerhåndbog / Ray Campbell Smith ; oversat fra engelsk af Niels Møller … [et al.]. - 1. udgave, 3. oplag. - Kjøbnhavn : Politiken, 1995. - 352 p. : ill., mainly in colour ; 25 cm. - (Politikens håndbøger)
§ Cover title: Materialer, teknikker og redskaber til maleri, tegning og grafik
NOT SEEN
In: KBK.

Politikens kunstnerhåndbog / Ray Campbell Smith ; oversat fra engelsk af Niels Møller … [et al.]. - 1. udgave, 4. oplag. - Kjøbnhavn : Politiken, 1996. - 352 p. : ill., mainly in colour ; 25 cm. - (Politikens håndbøger)
§ Cover title: Materialer, teknikker og redskaber til maleri, tegning og grafik
NOT SEEN
In: KBK.

Politikens kunstnerhåndbog / Ray Campbell Smith ; oversat fra engelsk af Niels Møller … [et al.]. - 1. udgave, 5. oplag. - Kjøbnhavn : Politiken, 2002. - 352 p. : ill., mainly in colour ; 25 cm. - (Politikens håndbøger)
§ Cover title: Materialer, teknikker og redskaber til maleri, tegning og grafik
NOT SEEN
In: KBK.

Politikens kunstnerhåndbog / Ray Campbell Smith ; oversaettelse og bearbejdelse til dansk Thomas Holst. - 2. udgave, 1. oplag. - Kjøbnhavn : Politiken, 2004. - 384 p. : ill., mainly in colour ; 25 cm. - (Politikens håndbøger)
§ Cover title: Materialer, teknikker, redskaber. Title on spine: Kunstnerhåndbog
ISBN 87-5677099-5
ISBN 978-87-5677099-6
NOT SEEN
In: KBK.

Nieuw handboek voor de kunstenaar. Complete gids voor gereedschap, materiaal en techniek / Ray Campbell Smith ; nederlandse vertaling Francien Vandenbergh. - [1st ed.]. - Houten : Gaade, Unieboek, cop. 1988. - 351 p. : ill., mainly in colour ; 25 cm.
Contents: p. 4.
Glossary: p. 338.
Literature: p. 344.
Index: p. 348.
ISBN 90-6017-852-1 (hard cover)
§ Translation of: Londen 1987 [No. 316.1].
NOT SEEN
In: KB; NCC; OBA; OBE; OBG; OBT; UBR.

Nieuw handboek voor de kunstenaar. Complete gids voor gereedschap, materiaal en techniek / Ray Campbell Smith ; nederlandse vertaling Francien Vandenbergh. - [2nd ed.]. - Houten : Gaade, 1995. - 351 p. : ill., mainly in colour ; 25 cm.
Contents: p. 4.
Glossary: p. 338.
Literature: p. 344.
Index: p. 346.
ISBN 90-6017-594-8 (hardcover)
NOT SEEN
In: KB; NCC; OBA.

Nieuw handboek voor de kunstenaar. Complete gids voor gereedschap, materiaal en techniek / Ray Campbell Smith ; nederlandse vertaling Francien Vandenbergh. - Derde druk. - Houten : Gaade, 1997. - 351 p. : ill., mainly in colour ; 24 cm.
MIP: pp. 266–274 : [40] ill.
Contents: p. 4.
Glossary: p. 338.
Literature: p. 344.
Index: p. 346.
ISBN 90-6017-594-8 (hardcover)
§ The illustrations are diagrams, photographs and reproductions.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Aluminium / Copper / Iron / Magnesium / Steel / Zinc
3 –
Printing in Black
4 –
Drawing / Linocut / Lithography / Painting / Photography / Screen Printing / Woodcut / Wood Engraving
5 –
Conservation and Restoration / Health and Safety
In: Priv.Coll.

Handboek voor de kunstenaar / [text and ill.] Ray Campbell Smith ; [transl. Marjan Faddegon-Doets]. - Baarn : Cantecleer, cop. 2004. - 384 p. : ill., mainly in colour ; 25 cm.
ISBN 90-213-3472-0 (hardcover)
§ Title on cover: Nieuw handboek voor de kunstenaar
Translation of: Londen 2003 [No. 316.2].
Newly designed and translated again based on the original text.
NOT SEEN
In: KB.

Handboek voor de kunstenaar / [text and ill.] Ray Campbell Smith ; [transl. Marjan Faddegon]. - Baarn : Tirion, cop. 2008. - 384 p. : ill., mainly in colour ; 26.5 cm. - (Tirion Art).
MIP: pp. 238–247 : ill.
ISBN 978-90-4391-202-0 (hardcover)

§ Title on cover: Handboek voor de kunstenaar : materiaal werkwijze technieken
This edition is the second edition of: Baarn 2004 [No. 316.12]
The illustrations are diagrams, photographs and reproductions.
The ISBN is changed, p. 4: 'This book is formerly published with ISBN 90-213-3472-0.'
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Copper / Iron / Zinc
3 –
Printing in Black
4 –
Digital Printmaking / Drawing / Linocut / Lithography / Painting / Photography / Screen Printing / Woodcut / Wood Engraving
5 –
Conservation and Restoration / Health and Safety
In: Priv.Coll.

316.14

Das Praxisbuch für Künstler : das vollständige Handbuch für Geräte, Techniken und Materialien zum Malen, Zeichnen und Drucken / Ray Smith.; [dt. Übers. Erwin Peters unter Mitarb. von Stefan Limmroth und Hajo Düchting]. - München : Ars-Ed., 1990. - 352 p. : ill. ; 25 cm.
ISBN 3-7607-8237-X
NOT SEEN
In: DNB-F; DNB-L.

316.15

Praxisbuch für Künstler Geräte, Materialien, Techniken / Ray Smith; [Übers. Erwin Peters … et al.]. - Starnberg : Dorling Kindersley, 2003. - 384 p. : ill. ; 27 cm.
ISBN 3-8310-0518-4
NOT SEEN
In: DNB-F; DNB-L.

316.16

Praxisbuch für Künstler Geräte, Materialien, Techniken / Ray Campbell Smith ; [2009 revision: Wilfried Baatz ; Susanne Ochs. Übers.: Erwin Peters (unter Mitarb. von Stephan Limroth und Hajo Düchting). Bearb. und zusätzliche Übers.: Hajo Düchting ; Manfred Mothes]. - München : Dorling Kindersley, 2009. - 384 p. : ill. ; 26 cm.
ISBN 3-8310-1513-9
ISBN 978-3-8310-1513-9
NOT SEEN
In: DNB-F; DNB-L.

316.17

Manual prático do artista : equipamento materiais procedimentos técnicas / Ray Campbell Smith; tradução Aurealiano Sampaio ; revisor Paula Vieira, Emílio Remelhe. - Porto : Civilização, 2004. - 384 p. : ill. ; 26 cm.
ISBN 989-550-125-0
ISBN 978-989-550-125-0
NOT SEEN
In: BNL.

Sonner (Hubert)
See: **Birkhofer 1** (Gerhard) [No. 031].
See: **Birkhofer 2** (Gerhard) [No. 032].

Spilsbury (Francis B.)   317

The art of etching & acqua tinting, strictly laid down by the most approved masters; sufficiently enabling amateurs in drawing to transmit their works to posterity; or, as amusements among their circle of friends. To which is added, the most useful liquid colours, well adapted for staining and colouring the above, &c. &c. / by F. Yrubslips. - London : printed for J. Barker, 1794. - 34 p. ; front., 2 pl. ; 18–19 cm.
Suppliers: p. 10, 11, 12.
Fondslijst: p. 34.
Specimens: pl. 3.
§ F. Yrubslips is the pseudonym of Francis B. Spilsbury.
The frontispiece (pl. 1) and plates are etchings; the etching on the title page is pl. 2.
1 –
Aquatint / Line Etching
2 –
Glass / Copper
3 –
Hand-colouring / Printing in Black / Printing Monochrome
In: BLBS; *Bridson & Wakeman 1984*: no. B42; *Levis 1912*: 94; NUC–1956; OCLC (2×).

Stahl (Carl J.)   318.1

Die moderne Gravierkunst : Geschichte und Technik des Gravierens / von C[arl] J. Stahl. - Wien ; Leipzig : Hartleben, 1906. - XIV, 272 p. : 55 Abb. ; 19 cm. - (Chemisch-technische Bibliothek ; 292).
MIP: p. 216.
§ Concerns making rubbings from engraved metal objects.
3 –
Printing in Black

4 –
Goldsmithing
In: CCB; KVK; NCC; TUD; UBA.

318.2

Die moderne Gravierkunst : Geschichte und Technik des Gravierens / von C[arl] J. Stahl. - 2., umgearb. und erw. Aufl. - Wien ; Leipzig : Hartleben, 1924. - VIII, 304 p. : 61 Abb. ; 19 cm. - (Chemisch-technische Bibliothek ; 292).
NOT SEEN
In: KVK.

Stapart (François)　319.1

L'art de graver au pinceau; nouvelle méthode, plus prompte qu'aucune de celles qui sont en usage, qu'on peut exécuter facilement, sans avoir l'habitude du burin ni de la pointe / mise au jour par [François] Stapart. - Paris : chez l'auteur [François Stapart] : chez Aumont, 1773. - 96 p. ; 17.5 cm.
Suppliers: p. 93.
§ BN: 'Mise au jour par M. Stapart'.
Approbation, p. 94: 'A Paris, ce 17 Mai 1773. COCHIN.'
Registration, p. 96: 'A Paris, ce 11 Août 1773. C.A. Jombert Pere, Syndic.'
Permission to publish, p. 96: 'Donné à Compiègne le quatrième jour du mois d'Août, l'an mil sept cent soixante-treize, & de notre Règne le cinquante-huitieme. Par le Roi en son Conseil, LEBEQUE.'
Printing, p. 96: 'De l'Imprimerie de Le Breton, premier Imprimeur ordinaire de ROI. 1773.'
Stapart, pp. 14–23 (on the copper plate), 23–40 (on the etching ground), and pp. 82–83 (on printing) are quoted from *Diderot & D'Alembert 1751–1781*, vol. 7 (1757), *Gravure*, pp. 877, 879, *Imprimerie en taille douce*, vol. 8 (1765), pp. 607–623;.
Intended audience, pp. 3–4: 'je dispose en faveur des Artistes & Amateurs … Non-seulement les Graveurs trouveront de [p. 4] quoi les interesser, mais même les Peintres & les Dessinateurs auront cet avantage.'
Review: *Mercure de France* (1773) (Oct.) 2: 110–112.
1 –
Aquatint / Line Etching
2 –
Copper
3 –
Printing in Black
In: *Blas Benito 1994*: 71; *Börsenverein 1885*; BN; CCB; *Figueras Ferrer 1992*: 1070; KVK; NUC–1956; RMA; *Singer & Strang 1897*: no. 63; ULC; V&A.

319.2

Die Kunst mit dem Pinsel in Kupfer zu stechen. Neue Methode, die viel geschwinder, als alle bisher übliche geht, und leicht ausgeführt werden kann, wenn man auch gleich mit dem Grabstichel oder der Radirnadel nicht umzugehen wüßte / aus dem Französischen des Herrn [François] Stapart ; übersetzt von J[ohann] C[onrad] Harrepeter. - Nürnberg : in der Christoph Weigelischen Kunsthandlung, 1780. - 118 p. : 18.5–19 cm.
§ Translation of the edition: Paris 1773.
With some notes by the translator.
The preface by the translator is dated, p. 10: 'Nürnberg den 3. März, 1780'.
In: ABK; HAB; KVK; MAK 1883, p. 292; NSUG; *Singer & Strang 1897*: no. 65.

Stauffer-Bern (Karl)　320.1

Radierbüchlein : die Kunst des Malers, auf zubereitete Kupferplatten zu zeichnen, dieselben zu ätzen und zu drucken : zum Selbstunterricht für die Maler aufgeschrieben und mit den nötigen Bildern versehen / von Karl Stauffer-Bern. - [Berlin], 1886.
§ Title means: Etching booklet, the art of the painter to draw on prepared copper plates, to etch and to print, written for the self-education of painters and with the necessary figures
Manuscript.
Language: German.
The author's name is Karl Stauffer and he came from Bern.
Intended audience, title page: 'zum Selbstunterricht für die Maler'.
Title description after: Dresden 1907 [No. 320.2].
1 –
Line Etching
5 –
Art History
NOT SEEN
In: present whereabouts unknown.

320.2

Karl Stauffer-Bern. 1857–1891 : ein Verzeichnis seiner Radierungen und Stiche : mit dem Manuscript zu einem 'Traktat der Radierung' aus dem Nachlass des Künstlers als Anhang / hrsg. von Max Lehrs. - Dresden : Arnold, 1907. - 136, [22] p. : front., 12 ill. ; 28.5–30 cm.
MIP: Tractat der Radierung / von Karl Stauffer-Bern. - Berlin, 1886. - P. 105–132.
Contents of the ms.: pp. 107–109.
Suppliers: p. 120–121.
§ Title means: Karl Stauffer-Bern 1857–1891, a catalogue of his etchings and engravings, with the manuscript of his 'Treatise on etching' from the artist's heritage as an appendix
Stauffer-Bern died in 1891 and his text was published posthumously.
The contents sounds promising, but the author probably never finished the text. What is found in the text does not always accord with the contents and many subjects from the contents are not discussed.
The author refers to Lalanne only; **Lalanne** (Paris 1866) [No. 178].
Intended audience, p. 113: '[Der Verfasser] wird ... bestrebt sein, dem Anfanger ... durch alle technischen und handwerklichen Schwierigkeiten nach

Kräften hindurch zu helfen ... Künstlerischer und ästhetischer Ratschläge wird er sich enthalten ... Für Dilettanten hat er dieses Buch nicht geschrieben.'
In: CCB; KB; KSM; NUC–1956; OCLC; UBAB; UBU.

Steel (Kenneth)   321.1

Line engraving / by Kenneth Steel. - London : Pitman, 1938. - VI, 57 p. : front., IX pl., 16 fig. ; 25 cm. - (The student's art books).
List of titles in the series: p. II.
List of illustrations: p. V.
§ Title on the cloth cover: The student's book of line engraving
The plates are reproductions, the figures are diagrams and photographs.
Intended audience, p. 1: 'this book is written principally for those whose knowledge of engraving is limited'.
1 –
Line Engraving
2 –
Brass / Copper / Zinc
3 –
Ink / Paper / Printing in Black
5 –
Aesthetics / Art History / Conservation and Restoration
In: BL; BLBS; NUC–1956; OCLC; Priv.Coll.; ULC.

321.2

Line engraving / by Kenneth Steel. - New York ; Chicago : Pitman Publishing Corporation, 1938. - VI, 57 p. : ill. ; 25 cm.
NOT SEEN
In: OCLC.

321.3

Line engraving / by Kenneth Steel. - Repr. - London : Pitman, 1948. - VI, 57 p. : front., IX pl., 16 fig. ; 25 cm. - (The student's art books).
List of titles in the series: p. II.
List of illustrations: p. [5].
In: BNM; OCLC; Priv.Coll. (2×)

Steinbacher (Volker)   322

Workshop Radierung : Gravieren, Drucken, Kolorieren / Volker Steinbacher ; [Fotos: Frank Schuppelius]. - Wiesbaden : Englisch-Verlag, 2006. - 79 p. : ill. ; 29 cm.
ISBN 3-8241-1337-6
ISBN 978-38241-13378
1 –
Drypoint / Line Etching
3 –
Hand-colouring / Printing in Black
NOT SEEN
In: KVK.

Sternberg (Harry)   323.1

Modern methods and materials of etching / by Harry Sternberg ; [preface by Carl Zigrosser] ; photogr. by Bruce Elkus. - First ed. - New York ; Toronto ; London : McGraw-Hill, 1949. - xii, 146 p. : [106] ill. ; 25.5 cm.
Contents: p. ix.
Suppliers: p. 145.
§ The illustrations are diagrams, photographs and reproductions.
Intended audience, front flap: 'This self-instructional guide to etching offers a basic approach for the beginner and advance procedures for the professional'; p. IV: 'A basic approach for the beginner and complex procedure for the professional.'
Review: *American Artist*, 13 (1949) (Nov.): 58.
Review: *Art Digest*, 24 (1950) (Jan.): 24.
Review: *Art News*, 48 (1950) (Feb.): 11.
Review: *The Studio*, 140 (1950) (Aug.): 64.
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Cardboard / Copper / Steelfacing / Zinc
3 –
Paper / Press / Printing in Black / Relief Printing
5 –
Conservation and Restoration
In: BL; *Blas Benito 1994*: 88; BLBS; NUC–1956; MET; OCLC (14×); Priv.Coll.; ULC.

323.2

Modern methods and materials of etching / Harry Sternberg. - 2nd ed. - New York : AMS Press, [planned for 1990].
ISBN 0-404-20245-4
§ A second edition or reprint was planned for 1990, but never published.
NOT PUBLISHED

Stijnman (Ad)

Stijnman 1 (Ad)   324

Over grafiek / notitieboek van Ad Stijnman. - Oudewater, 1979. - 204 p. : [35] diagrams. + [7] loose fol. ; 21.5 cm.
Literature: p. 4.
With literature.
§ Title means: About printmaking
Manuscript.
Language: Dutch.
A gathering of quotations from the books in the literature list, with further comments and observations covering all aspects of intaglio printmaking techniques.
The introduction is dated, p. [2]: '14 januari 1979, Oudewater - 30 april 1979, Oudewater'. With later additions.
1 –
Aquatint / Collagraph / Crayon Engraving / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Relief Etching / Soft-ground
2 –
Aluminium / Brass / Copper / Iron / Plastic / Zinc
3 –
Blind Embossment / Casting / Counterproof / Leather / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Rubbing / Steelfacing / Textile / Viscosity Colour Printing
4 –
Monotype / Troubleshooting
5 –
Aesthetics / Conservation and Restoration
In: Priv.Coll.

Stijnman 2 (Ad)   325.1

Fouten in de prent bij het etsen. Wat er allemaal mis kan gaan, de eventuele oorzaken, en de mogelijke oplossingen / naar eigen en andermans bevindingen, Ad Stijnman ; [ill. Ad Stijnman]. - [1st ed.]. - [Den Haag] : [Koninklijke Academie van Beeldende Kunsten], 1980. - 20 p. : [4] ill. ; 30 cm.
Edition: c. 70 copies.
§ Title means: Mistakes in the printing of etchings. Things that can go wrong, possible causes and remedies.
This is an internal publication.
Based on: **Stijnman 1** (Oudewater 1979) [No. 324]: 66–71.
1 –
Aquatint / Drypoint / Line Etching / Mezzotint
2 –
Iron / Copper / Steel / Zinc
3 –
Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing
4 –
Troubleshooting
In: KABK; Priv.Coll.

325.2

Fouten in de prent. Wat er allemaal mis kan gaan bij het afdrukken van etsen, mogelijke oorzaken, oplossingen en hoe je het kunt voorkomen / Ad Stijnman ; [ill. Ad Stijnman]. - [2nd rev. ed.]. - [Den Haag] : [Koninklijke Academie van Beeldende Kunsten], 1981. - I–III, 1–23, IV–VI p. : [18] ill. ; 30 cm.
Literature: p. I.
Edition: c. 70 copies.
§ Title means: Mistakes in the printing of etchings. What can go wrong in printing etchings, possible causes, remedies and how to prevent it
This is an internal publication.
1 –
Aquatint / Drypoint / Line Etching / Mezzotint
2 –
Iron / Copper / Steel / Steelfacing / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing
4 –
Troubleshooting
In: KABK; Priv.Coll.

325.3

Etsvademecum. Een beschrijving van techniek, kenmerkende verschijnselen, oorzaken en oplossingen bij het afdrukken van etsen / Ad Stijnman ; [ill. Ad Stijnman] ; [photogr. Arjan Smalen]. - De Bilt : Cantecleer, 1985. - 136 p. : 73 ill., 15 afb., VIII pl. ; 20.5 cm.
Contents: p. 5.
Glossary: p. 9.
Scheme: p. 22.
Polyglot: p. 109.

Literature: p. 129.
Index: p. 132.
ISBN 90-213-0017-6 (softcover)
§ Title means: Etching vademecum. A description of techniques, specific phenomena, causes and remedies in the printing of etchings
The illustrations are diagrams in the text. The *afbeeldingen* show details of prints with certain phenomena. The plates are reproductions following the text.
The polyglot is Dutch–German–English–French.
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Iron / Steel / Steelfacing / Zinc
3 –
Blind Embossment / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Troubleshooting
5 –
Health and Safety
In: GBR; GLA; KB; KABK (3×); MMW; NBLC; NCC; OBA; PBM; Priv.Coll. (4×); RAA; UBA; UBL-KHI; UBR.

325.4

[German translation]. - Bern : Haupt, [planned for 1987]
§ The text was translated into German and publication was planned for 1987, but the book was never published.
NOT PUBLISHED

Stobart (Jane)   326.1

Printmaking for beginners / Jane Stobart. - [1st ed.]. - London : A&C Black, 2001. - 112 p. : front., [107] ill., of which [14] b/w diagrams ; 23.5 cm. - (Printmaking handbooks).
Contents: p. 5.
MIP: pp. 23–25, 45–75 : [33] ill., of which [3] b/w diagrams.
Glossary: p. 103.
Literature: p. 107.
Suppliers: p. 109.
Index: p. 111.
ISBN 0-7136-5037-0 (softcover)
§ The illustrations are diagrams, photographs and reproductions.
Review: A. Desmet, 'Introduction to print', in *Printmaking Today*, 10 (2001) 2: 34.
See also: **Stobart 1** (1997) [No. 592]; **Stobart 2** (1997) [No. 593]; **Stobart 3** (2001) [No. 594].
1 –
Aquatint / Collagraph / Drypoint / Lift-ground / Line Etching / Soft-ground
2 –
Copper / Linoleum / Plastic / Zinc
3 –
Chine Collé / Ink / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Linoleum Cut / Lithography / Monotype / Screen Printing / Wood Engraving / Woodcut
In: BL; KVK; Priv.Coll.

326.2

Printmaking for beginners / Jane Stobart. - [1st ed.]. - New York : Watson-Guptill Publications, 2002. - 112 p. : ill. ; 24 cm. - (Printmaking handbooks).
ISBN 0-8230-4293-6 (softcover?)
NOT SEEN
In: LC.

326.3

Printmaking for beginners / Jane Stobart. - 2nd [augm.] ed. - London : A&C Black, 2005. - 127 p. : ill. ; 24 cm. - (Printmaking handbooks).
ISBN 978-0-7136-7463-7 (softcover)
ISBN 0-7136-7463-6 (softcover)
NOT SEEN
In: BL; KVK.

326.4

Printmaking for beginners / Jane Stobart. - 2nd [augm.] ed. - New York : Watson-Guptill Publications, 2005. - 128 p. : front., [124] ill., incl. [13] b/w diagrams ; 24 cm. - (Printmaking handbooks).
MIP: pp. 50–91 : [45] ill., incl. [13] b/w diagrams.
Glossary: p. 120.
Literature: p. 124.
Suppliers: p. 125.
Index: p. 127.
ISBN 0-8230-4380-0 (softcover)
1 –
Aquatint / Carborundum Print / Collagraph / Drypoint / Lift-ground / Line Etching / Soft-ground
2 –

Copper / Linoleum / Plastic / Zinc
3 –
Chine Collé / Ink / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Linoleum Cut / Lithography / Monotype / Screen Printing / Wood Engraving / Woodcut
5 –
 Conservation and Restoration
In: LC; Priv.Coll.

<div align="right">326.5</div>

Einfach drucken : Techniken für Anfänger / Jane Stobart ; [transl. Martin Rometsch]. - Bern ; Stuttgart ; Wien : Haupt, 2003. - 112 p. : ill. ; 24 cm.
ISBN 3-258-06608-6 (softcover)
NOT SEEN
In: DNB-F; DNB-L.

<div align="right">**Stoltenberg** (Donald)   327</div>

Collagraph printmaking / Donald Stoltenberg ; photogr. by Ralph Snow MacKenzie. - Worcester, Mass. : Davis Publications, [1975]. - 95 p. : ill., partly in colour ; 27 cm.
ISBN 0-87192-067-0
1 –
Collagraph
NOT SEEN
In: BL; LC.

<div align="right">**Strang** (David)   328.1</div>

The printing of etchings and engravings / by David Strang ; with an introduction by Martin Hardie. - [1st ed.]. - London : Benn, 1930. - X, 218, [15] p. : 27 fig. ; 22.5 cm.
Contents: p. IX.
List of illustrations: p. X.
Index: p. [1].
Advertisement: p. [13].
§ *Blas Benito* gives an edition '1936' instead of '1930', but this is probably a typographical error as all editions found are dated '1930'.
See also: **Strang 1** (1939) [No. 595]; **Strang 2** (1941) [No. 596]; **Strang 3** (1944–1945) [No. 597].
2 –
Copper / Steelfacing / Zinc
3 –
Ink / Paper / Press / Printing in Black
4 –
Troubleshooting
5 –
Conservation and Restoration
In: BL; *Blas Benito 1994*: 88; BLBS; *Bridson & Wakeman 1984*: nos. B77, B 78, B79; CCB; MBvB; NCC; NUC–1956; OCLC; Priv.Coll. (3×); RAL; RMA; UBU; ULC.

<div align="right">328.2</div>

[Letter to Mr. Unné] / David Strang. - London, 16 April 1949. - [1] fol. ; 18 cm.
In: **Strang** (London 1930) [No. 328.1]: loose sheet recto.
§ Manuscript.
Language: English.
Letter in pencil on a scrap of printing (?) paper concerning the present (poor) availability of printing paper and its use by David Strang, a professionale plate printer.
David Strang's address is: '20 Hamilton Terrace, London N.W. 8'. David Strang was the brother of Ian Strang, an etcher who was also an active plate printer, see: **Strang** (Ian; London 1938) [No. 329]. In 1924 Ian Strang's address was 7 Hamilton Terrace; **Plowman 2** (London 1924) [No. 243]: 93.
3 –
Paper
In: Priv.Coll.

<div align="right">328.3</div>

The printing of etchings and engravings / by David Strang ; with an introduction by Martin Hardie. - [1st ed.]. - New York : Dodd, Mead, 1930. - X, 218, [15] p. : 27 fig. ; 22.5 cm.
NOT SEEN
In: NUC–1956; MET; OCLC (31×).

<div align="right">**Strang** (Ian)329.1</div>

The student's book of etching / by Ian Strang ; [ill. Ian Strang]. - [1st ed.]. - London : Pitman, 1938. - 58 p. : ill. ; 4º. - (The student's art books).
§ In 1924 Ian Strang's address was 7 Hamilton Terrace; **Plowman 2** (London 1924) [No. 243]: 93.
Ian Strang was the brother of David Strang, see: **Strang** (David; London 1930) [No. 328].
NOT SEEN
In: BL; Worldcat.

<div align="right">329.2</div>

The student's book of etching / by Ian Strang ; [ill. Ian Strang]. - [1st ed.]. - New York ; Chicago : Pitman Publishing Corporation, 1938. - [4], 58 p. : front., 18 fig. ; 24–25 cm. - (The student's art books).
§ It seems likely that the book was also published in London at the same time.

NOT SEEN
In: BL; BLBS; NUC–1956; ULC.

Etching / by Ian Strang ; [ill. Ian Strang]. - Repr. - London : Pitman, 1946. - [4], 58 p. : [1] front., 18 fig. ; 25 cm. - (The student's art books).
Stocklist: p. [2].
§ The figures are reproductions after drawings and prints by Ian Strang.
1 –
Drypoint / Line Etching
2 –
Copper
3 –
Printing in Black
In: NUC–1956; OCLC; Priv.Coll. (2×).

Il geste e il segno : tecnica dell' incisione / Guido Strazza ; [introd. Carlo Bertelli] ; curata da Vanni Scheiwiller e Giorgio Lucini. - [Milano?] : Scheiwiller, cop. 1979. - 173 p. : [242] diagrams, 26, [1] details ; 30 cm.
Making hatchings and signs: p. 11–71.
MIP: pp. 73–161 : [81] diagrams, 26, [1] details.
Literature: p. 167.
Contents: p. 169.
Loose sheet with addenda & corrigenda.
Edition: numbered 1–90 (with etch. by Strazza), numbered I–IX (hors commerce, with etch. by Strazza), 3,000 numbered copies (trade ed.).
§ Title means: Gesture and sign: technique of etching
The details show various intaglio textures.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint
2 –
Copper / Zinc
3 –
Multiple-plate Printing / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
5 –
Aesthetics / Conservation and Restoration
In: BL; *Blas Benito 1994*: 88; Priv.Coll.

Il geste e il segno : tecnica dell' incisione / Guido Strazza. - Sant'Oreste (Roma) : Edizioni di Apeiro, 1995. - 172 p. : ill ; 30 cm.
NOT SEEN
In: OCLC; SBB.

Handbuch der Gravierkunst : ein Werkstattbuch für die Praxis und den Fachschulunterricht / Curt Streubel. - Leipzig : Fachbuchverlag, 1955. - VIII, 244, [44] p. : 191 Bilder, XXXVIII Tafel ; 23.5 cm.
Contents: p. VI.
Literature: p. 239.
Index: p. 241.
List of reproductions: p. [2].
Publisher's catalogue: p. [42].
§ *Vorwort* dated, p. : 'Leipzig, August 1954'.
The *Bilder* are diagrams, photographs and wood engravings. The *Tafel* are reproductions and are bound after the text.
P.V: this manual is meant to stimulate people to learn a second craft, because of the lack of available craftsmen (so shortly after WWII). It is also meant as a textbook in the training of practical engravers and as a reference work.
1 –
Electrolytic Etching / Line Engraving / Line Etching
2 –
Aluminium / Brass / Copper / Glass / Silver / Zinc
3 –
Rubbing
4 –
Goldsmithing
5 –
Art History
In: Priv.Coll.

[Notebook] / Richards Symonds. - [London ; Italy], 1649–1659. - 107 fol. ; sketches ; […] cm.
MIP: fol. 21, 23, 34–36, 126–128, 130–131, 159, 164.
Suppliers: fol. 34, 164.
§ Manuscript.
Languages: English, German, Italian.
Symonds kept notes on art technological recipes and prescriptions during his travelling to and in Italy 1649–1651; with some additional material of

later date, such as his discussion with Wenceslas Hollar in London in 1659.
Title description after: 1984 [No. 332.2].
1 –
Line Etching
2 –
Copper
3 –
Ink / Printing in Black
In: BL, Ms. Egerton 1636; *Harley 1969*: 6.

332.2

A study of Richard Symonds, his Italian notebooks and their relevance to seventeenth-century painting techniques / Mary Rose Beal. - New York ; London : Garland, 1984. - 409 p. : diagrams ; 24 cm. - (Outstanding theses from the Courtauld Institute of Art).
MIP: pp. 223–224, 230–232, 274–277, 288, 290–291 ; [1] diagram.
Literature: p. 391.
ISBN 0-8240-5976-X (hardcover)
§ Contains the transcription of Symonds notebooks.
In: KB; KVK; RMA; UBA; UBU.

T

Taylor (Charles)
See: **Compendium** [No. 067].

Taylor (George)
See: **Plowman 1** (George Taylor) [No. 242].
See: **Plowman 2** (George Taylor) [No. 243].

Tedeschi (Nereo)   333.1

La stampa degli artisti : l'acquaforte / Nereo Tedeschi. - [1st ed.]. - Verona : Fiorini, 1971. - X, 108 p. : 59 fig. ; 24 cm.
Contents: p. VII.
Suppliers: p. 101.
Glossary: p. 103.
Literature: p. 105.
List of figures: p. 107.
§ Title means: The artist's print: the etching
In: BL; OCLC; Priv.Coll.

333.2

La stampa degli artisti (l'acquaforte) / N[ereo] Tedeschi. - II [rev.] ed. - Milano : Campione, 1980. - 152 p. : 87 fig., of which [8] in colour ; 24 cm.
Other publications by the author: p. 4.
Contents: p. 7.
Suppliers: p. 146.
Glossary: p. 147.
Literature: p. 149.
§ The preface is dated, p. 9: 'Verona, marzo 1980'. The printing is dated, p. 152: 'Finito di stampare con i tipi della tipografia moderna di Vicenza - nel mese di marzo 1980'.
1 –
Aquatint / Drypoint / Line Etching / Mezzotint / Relief Etching / Soft-ground
2 –
Copper / Steelfacing / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Press / Printing in Black / Printing Polychrome / Viscosity Colour Printing
4 –
Troubleshooting
5 –
Art History / Conservation and Restoration
In: BNCF.

Tempesti (Domenico)   334.1

Regole et avvertimenti cavati dalla memoria di Roberto Nanteil con altri ancora di diversi valenti huomini ragionando dell'intaglio e della maniera che in tale si deve avere. L'anno 1677 fino in 80 / Domenico Tempesti ; [maximes by Robert Nanteuil]. - Paris ; Firenze, 1677–1680. - 113 fol. : fig. ; […] cm.
§ Manuscript.
Language: Italian.
Title means: Rules and advices extracted from the memory of Robert Nanteuil and others again of several skilful men discussing about engraving and of the manner how it should be done. From the year 1677 to 1680
Title description after: Firenze 1994 [No. 334.2].

1 –
Line Engraving
2 –
Copper
3 –
Ink / Paper / Printing in Black
5 –
Aesthetics
NOT SEEN
In: BMa, Ms. It. CL 4 № 46.

Domenico Tempesti e i discorsi sopra l'intaglio ed ogni sorte d'intagliare in rame da lui provate e osservate dai più grand'huomini di tale professione / a cura di Furio de Denaro ; maximes de Robert Nanteuil ; presentazione di Decio Gioseffi ; [diagrams by Furio de Denaro]. - Firenze : Studio Per Edizioni Scelte, cop. 1994. - 202 p. : 43 reprod., [34] diagrams ; 22.5 cm. - (Specimen ; 11).
General contents: p. 5.
Contents of the manuscript: p. 65.
Index: p. 69.
MIP: pp. 96–172 : reprod. 25–34, [24] diagrams.
Literature: p. 173.
List of illustrations: p. 179.
§ Title means: Domenico Tempesti and the treatises on the engraving and every kind of engraving on copper proved by him and observed from the greatest men in this profession
With a transcription of the part on intaglio printmaking and a translation of the maximes by Nanteuil.
Reproductions 25–34 are from pages of the manuscript. The diagrams are copies by Furio de Denaro after drawings in the manuscript.
Review: M. Préaud, 'Domenico Tempesti', in *Print Quarterly*, 12 (1995) 4: 408–409.
Préaud: 'Extracts from the manuscript of Domenico Tempesti, kept in a volume in the Biblioteca Nazionale Marciana in Venice, have already been published several times, first by Eugène Piot in his *Cabinet de l'amateur* in 1861–1862, and later by Charles Lorquet in his *Vie de Robert Nanteuil* in 1883–85 and in 1925 by Georges Duplessis, Charles Petitjean and Charles Wickert in their *Catalogue de l'oeuvre gravé de Robert Nanteuil*, to mention only the most important. But, except for the *Maximes sur la peinture et sur la gravure* of Nanteuil himself – actually written in French in Nanteuil's own hand – these only give very loose and fragmentary translations. Furio de Denaro gives us for the first time the whole text of Tempesti, accompanied by an introduction and notes that demonstrate he knows well the work of engraving.'
1 –
Line Engraving
2 –
Copper
3 –
Printing in Black / Ink / Paper
5 –
Aesthetics / Art History
In: KVK; OCLC; Priv.Coll.

Ter Borch (Gerard)
See: **Borch** (Gerard ter) [No. 041].

Ter Brugghen (Gerard)
See: **Brugghen** (Gerard ter) [No. 050].

Terborgh (Gerard)
See: **Borch** (Gerard ter) [No. 041].

Thon (Theodor)
See: **Perrot** (Aristide-Michel) [No. 234.4].

Thorstensen (Sverre Thorolf)
Radér- og etseteknikk / Sv[erre] [Thorolf] Thorstensen. - Oslo : Fabritius & Sønners, 1946. - 291 p. : [101] ill. ; 24.5 cm.
Contents: p. 5.
Suppliers: pp. 33, 34.
List of artists: p. 249.
Literature: p. 257.
With literature.
§ Title means: Etching technique
Copyright: 1944.
The illustrations are diagrams, photographs and reproductions.
The manual is not only meant for artists, but also for professional engravers given the cooperation with the Norges Geografiske Oppmåling, the Statens Håndverks- og Kunstindustriskole and the Statens Teknoligiske Institut where the photographs were taken.
1 –
Aquatint / Crayon Etching / Drypoint / Lift-ground / Line Etching / Photomechanical Etching / Relief Etching / Ruling Machine / Stipple Engraving / Soft-ground
2 –

Copper / Glass / Plastic / Steel / Steelfacing / Zinc
3 –
Casting / Multiple-plate Printing / Paper / Press / Printing in Black / Printing Monochrome / Relief Printing / Rubbing / Textile
4 –
Monotype / Photography
5 –
Art History
In: BIBSYS (8×); LIBRIS; NUC–1956.

Tinsley (Francis)
See: **Hacking** (Nicholas) [No. 132].

Tiquet (François)   336.1

Korte onderrigting en leer, van zeer fraaye geheymen. Diverse edel-gesteentens daar men de natuur in de steenen vind of ziet, na te bootzen, als lapis lazuli, jaspis, agaat, porphir, &c. Zeer dienstig omme huyzen, kamers, als buiten-plaatse te vercieren. Item transparante of doorzigtige steene te maaken, onder het glas te brengen, tot tafels, spiegels, lysten, gueridons, doozen, &c. Als ook verscheide heerlyke vernissen en kostbaare verfven; zeer nut voor koetze schilders, en beeldhouwers, omme extra ordinair fraay te vergulden / uytgevonden, en voor liefhebbers in 't ligt gegeeven, door François Tiquet. - Antwerpen : by Philippus van Overbeken, 1741. - 101, [7] p. ; 16.5–17.5 cm.
Contents: p. [3].
MIP: pp. 83–91, 99.
§ Title means: Short instruction and tuition, of very fine secrets. To imitate diverse gems in which stones one finds or sees nature, like lapis lazuli, jasper, agate, porphyry, etc. Very serviceable for decorating houses, rooms, as well as country houses. Also to make transparent or clear stones, to frame behind glass, for tables, mirrors, frames, coffee-tables, boxes, etc. as well as to make several fine varnishes and precious paints; very serviceable for coach-painters, and sculptors, to guild extraordinarily fine
Intended audience, p. 89: 'de Dames die uit lief hebbery iets zelfft zouden willen graveeren'.
1 –
Line Etching
2 –
Copper
3 –
Ink / Textile
5 –
Health and Safety
In: CCB; DBI-VK; NCC; NUC–1956; PBL; RMA; UBU.

336.2

Traité de plusieurs beaux secrets. Très utile pour les artistes et curieux & le beau secret de la composition sous la glace / fait en composé, par François Tiquet. - La Haye [= Den Haag?] : chez Isaac Beauregard, 1747. - 46 p. ; 24 cm.
MIP: pp. 34–37.
Contents: p. 44.
§ Translation of the edition: Antwerpen 1741.
The content on intaglio printmaking is the same, except that the printing ink recipe is missing.
Although this edition seems to have been published in Den Haag ('La Haye'), no copy could be traced in any public library in the Netherlands, unless a town La Haye in France is meant.
In: DBI-VK; NSUG; SLSU.

Tischbein the Younger (Johann Heinrich)   337.1

Kurzgefaßte Abhandlung über die Aetz-Kunst und die geätzten 84 Blätter / welche durch Johann Heinrich Tischbein hrsg. sind. - [1st ed.]. - Cassel : gedruckt in der Hof-Buchdruckerey, bey J.P.H. Deny, 1790. - 28 p. : [1], titlepl., 84 etch. ; 34–36.5 cm.
Literature: p. 5, 6, 8.
Addenda & corrigenda: p. 22.
List of etchings: p. 23.
§ According to Krünitz (vol. 56 (Berlin 1792): 422) it was probably not intended for the trade: 'meines Wissens, bisher nicht in den Buchhandel gekommen'.
Intended audience, title page: 'Zur Belehrung für angehende Künstler und Liebhaber.'
OCLC describes 128 plates on 78 sheets. All other references mention 84 plates. The list gives 84 etchings; not mentioned is the etching on the title page. The prints were also sold loose or in small series, see p. 28. Some copies do not contain the plates. The list of illustrations is ordered by subject.
The differences between the texts of the three editions are only minor.
Title description after a microfilm that did not reproduce the plates.
Quoted in: **Bosse** (Nürnberg 1795) [No. 042.25] 2: 95–117.
Tischbein intended to add an appendix later on colour printing, p. 22: '... in zukunft diesem Werkchen eineme Anhang folgen zu lassen, worinn das ganze Verfahren geätzte Blätter in Colorit zu verfertigen, so wie die Werke des Herrn C. Plos [sic!] van Amstel und von Msr. le Prince darstellen'. The appendix never appeared and this line is deleted in the 1827 edition.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Line Etching
2 –
Copper
5 –
Original and Reproduction
In: *Börsenverein 1885*; DBI-VK; NSUG; NUC–1956; OCLC (2×); RMA, 323 D 18; SBB; *Singer & Strang 1897*: no. 66.

Oeconomische Encyclopädie, oder allgemeines System der Land-, Haus-, und Staats-Wirthschaft in alphabetischer Ordnung / aus dem Französischen übersetzt und mit Anmerkungen und Zusätzen vermehrt, auch nöthigen Kupfern versehen von Johann Georg Krünitz. - Berlin : bei Joachim Pauli, 1773–1858. - 242 vol. : ill. ; 20 cm.

§ Title, editor and *impressum* differ per volume.

Vol. 56: Oekonomisch-technologische Encyklopaedie, oder allgemeines System der Stats- Stadt- Haus und Land-Wirthschaft, und der Kunst-Geschichte, in alphabetischer Ordnung. Sechs und funfzigster Theil: von Kupfer bis Kurr / von Johann Georg Krünitz. - Berlin : bei Joachim Pauli, 1792. - [2], 815, [5] p. : front., [1] vign. on titlep., [1] vign. in the text, [2] folding pl. at the back ; 20 cm.

MIP: pp. 421–458.

Literature: p. 425.

List of prints: p. 451.

§ Contains a full copy of the text with some minor changes and without the plates of the edition: Cassel 1790.

In: DNB-F; KB; NUC–1956; *Schießl 1989*: no. 127; UBR (inc.).

Die Radier- und Aetzkunst in ihrem ganze Umfange, oder gründliche Anweisung, alle Arten Zeichnungen mit leichter Mühe auf Kupfer- Zink- und Zinnplatten sehr täuschend nachzuahmen / hrsg. von Johann Heinrich Tischbein. - Zweite umgeänderte und verbesserte Aufl. - Zwickau : Im Literatur- und Kunst-Comtoir, 1827. - 19, [1] p. : 20 Probeblätter ; 25.5 cm.

List of illustrations: p. 3.

Literature: pp. 6–7.

§ The text of the first edition has been revised slightly with some lines deleted and the spelling changed slightly.

With only 20 plates, about half of which are new. The list of plates is ordered by technique. The plates are dated: 'den 19ten febr: 1783' (pl. 4), '1783' (pl. 6), '1795' (pl. 16), '1793 (pl. 19).

1 –

Aquatint / Crayon Engraving / Crayon Etching / Line Etching

2 –

Copper / Tin / Zinc

5 –

Original and Reproduction

In: BL; BLBS; NUC–1956; RMA.

Tollemache (Wilbraham)   338

[Notes on art technology] / [comp. by Wilbraham Tollemache?]. - [Calverley Hall?], [1767]. - [12] p. ; 19 cm.

§ Manuscript.

Language: English.

Spelman: 'An earlier 12 page gathering dated 1767 has been stitched onto a page, and this also contains colour recipes, names of pencils &c, advice on etching and materials to use, and a note on the first page is for a bill delivered to the Hon. Wilbram Tollemach, Jan 7th, 1767. About 45 pages of the main volume contain recipes, the remainder being struck through accounts. The Honourable Wilbraham Tollemache (1739–1821), of Calverley Hall was a patron of Reynolds and Gainsborough.'

1 –

Line Etching

NOT SEEN

In: *Spelman 2010*, cat. Aug. 2010: no. 20.

Trevelyan (Julian Otto) 339.1

Etching : modern methods of intaglio printmaking / by Julian [Otto] Trevelyan. - [First published]. - London : Studio Books, cop. 1963. - viii, 9–96 p. : [7] diagrams, 60 reprod., of which [4] in colour ; 25.5 cm. - (Studio handbooks).

Contents: p. v.

List of illustrations: p. vi.

Literature: p. viii.

Suppliers: p. 94.

Index: p. 96.

Stocklist: backflap.

Titles in the series: backside cover.

§ Pl. 40 is also printed on the title page.

1 –

Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Soft-ground

2 –

Aluminium / Iron / Copper / Steel / Zinc

3 –

Casting / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing

5 –

Aesthetics

In: BL; BLBS; BNB50; CCB; KB; OCLC (33×); Priv.Coll.; RAA; SBB; TUD.

Etching : modern methods of intaglio printmaking / by Julian [Otto] Trevelyan. - [First published]. - New York : Watson-Guptill, 1964. - viii, 9–96 p. : [7] diagrams, 60 reprod., of which [4] in colour ; 25.5 cm.

NOT SEEN

In: *Blas Benito 1994*: 89; *Figueras Ferrer 1992*: 1072; OCLC (31×).

Etching : modern methods of intaglio printmaking / by Julian [Otto] Trevelyan. - Repr. - London : Studio Vista, 1965. - viii, 9–96 p. : [7] diagrams, 60 reprod., of which [4] in colour ; 25.5 cm. - (Studio handbooks).
Contents: p. v.
List of illustrations: p. vi.
Literature: p. viii.
Suppliers: p. 94.
Index: p. 96.
Stocklist: backflap.
Titles in the series: backside cover.
§ Identical to the edition: London 1963. The list of suppliers is updated.
In: CCB; NCC; Priv.Coll. (2×); TUT.

Tiefdruckgraphik heute : Technik und Gestaltung / Julian [Otto] Trevelyan ; Deutsche Grundübersetzung von Birgit C[laudia] Lieschung ; Deutsch bearbeitet von Richard Franz. - [1st ed.]. - Ravensburg : Maier, 1963. - 96 p. : 60 Abb., partly in colour ; 25 cm.
NOT SEEN
In: CCB; DBI-VK; KVK; NCC; OBDH; UBA.

Tiefdruckgraphik heute : Technik und Gestaltung / Julian [Otto] Trevelyan; [Deutsche Grundübersetzung von Birgit C[laudia] Lieschung] ; Deutsch Bearbeitung von Richard Franz . - [2nd ed.]. - Ravensburg : Maier, [printed 1966]. - 96 p. : 60 Abb., of which [4] in colour ; 24.5–25 cm.
Contents: p. 5.
List of illustrations: p. 7.
Glossary: p. 88.
Literature: p. 93.
Index: p. 94.
§ The *Abbildungen* are diagrams and reproductions. *Abb*. 56 is after a mezzotint by Felix Hollenberg (*Abend am Neckar*) and is not reproduced in the English edition.
In: DNB-F; DBI-VK; KVK; SBB; UBAB.

Turner (Silvie)
See: **Hacking** (Nicholas) [No. 132].

[Notes on art technology] / comp. by Theodor Turquet de Mayerne. - [London], [1620–1646?]. - 170 fol. ; […] cm.
§ Manuscript.
Language: French.
Werner, p. 132: 'Methods of preparing acids, grounds and varnishes. These include receipts for varnishes ascribed to Jacques Callot.'
Werner, pp. 130, 132: 'Most of this book was also compiled by De Mayerne and dates from the same period as Ms. Sloane 2052. De Mayerne left the ms. to John Colladon, his nephew by marriage, who further extended it.'
This manuscript is relatively obscure because the text of this manuscript was never published, contrary to the text of its counterpart BL, Ms. Sloane 2052, see: **Turquet de Mayerne 2** (London 1620–1646) [No. 341].
1 –
Line Etching
NOT SEEN
In: BL, Ms. Sloane 1990; *Harley 1969*: 4; *Werner 1964*.

Pictoria sculptoria & quae subalternarum artium = Pittura scultura e delle arti minori / comp. by Theodor Turquet de Mayerne. - [London], 1620–[1646?]. - 170 fol. ; […] cm.
MIP: Pour graver planches avec eau forte … [etc.]. - Fol. 33v–37v.
§ Title means: Painting, sculpture and the minor arts
Title MIP means: To engrave plates with strong water … (etc.)
Manuscript.
Language: French.
Harley: 'Most of it was written in French in Mayerne's hand, c. 1620–1640, whereas some parts are written in English, German, Italian and Latin.'
Turquet de Mayerne was in contact with many artists and artisans and gathered information from them, both verbally and from demonstrations, on art technology.
See also its counterpart BL, Ms. Sloane 1990; **Turquet de Mayerne 1** (London 1620–1646) [No. 340].
Title description after: Walluf bei Wiesbaden 1973 [No. 341.4]; Lyon 1970 [No. 341.7]; Anzio 1995 [No. 341.8].
1 –
Line Etching
2 –
Copper
3 –
Counterproof / Ink / Printing in Black
In: BL, Ms. Sloane 2052; *Harley 1969*: 4.

Quellen für Maltechnik während der Renaissance und deren Folgezeit (XVI.-XVIII. Jahrhundert) in Italien, Spanien, den Niederlanden, Deutschland, Frankreich und England: nebst dem De Mayerne Manuskript / (zum ersten Male hrsg. mit Übersetzung und Noten versehen) von Ernst Berger. - München : Callwey, 1901. - xlvi, 454 p. : ill. ; 28 cm. - (Beiträge zur Entwicklungsgeschichte der Maltechnik ; IV).

MIP: Pour grauer planches auec eau forte … [etc.] = Um Platten mit Scheidewasser zu ätzen … [etc.]. - P. 160–169.
§ Transcription and German translation of Bl. Ms. Sloane 2052.
Transcription of the original French text on the left and the German translation by Berger on the right on facing pages. Notes and comments on pp. 384–387.
Photomechanical reprints: Walluf bei Wiesbaden 1973 [No. 341.4]; Walluf-Nendeln 1975 [No. 341.5]; Vaduz 1984 [No. 341.6].
Title description after: Walluf 1973 [No. 341.4].
NOT SEEN
In: KB; RAA; TUD; UBU.

341.3

Het De Mayerne manuscript als bron voor de schildertechniek van de Barok, British Museum, Sloane 2052 : proefschrift ... Utrecht / Johannes Alexander van de Graaf. - Mijdrecht : Verweij [printer], 1958 - XII, 231 p.; 27 cm.
§ Contains the parts on painting technique only, without the information on intaglio printmaking.
In: RCE.

341.4

Quellen für Maltechnik während der Renaissance und deren Folgezeit (XVI.-XVIII. Jahrhundert) in Italien, Spanien, den Niederlanden, Deutschland, Frankreich und England: nebst dem De Mayerne Manuskript / (zum ersten Male hrsg. mit Übersetzung und Noten versehen) von Ernst Berger. - Unveränderter Neudruck. - Walluf bei Wiesbaden : Sändig, 1973. - xlvi, 454 p. ; 22 cm. - (Beiträge zur Entwicklungsgeschichte der Maltechnik ; IV).
MIP: Pour grauer planches auec eau forte … [etc.] = Um Platten mit Scheidewasser zu ätzen … [etc.]. - P. 160–169.
§ Transcription and German translation of Bl. Ms. Sloane 2052.
Transcription of the original French text on the left and the German translation by Berger on the right on facing pages. Notes and comments on pp. 384–387.
Photomechanical reprint of: München 1901 [No. 341.2].
In: RCE.

341.5

Quellen für Maltechnik während der Renaissance und deren Folgezeit (XVI.-XVIII. Jahrhundert) in Italien, Spanien, den Niederlanden, Deutschland, Frankreich und England nebst dem De Mayerne Manuskript / (zum ersten Male hrsg., mit Übersetzung und Noten versehen) von Ernst Berger. - 2., unveränderter Neudruck. - Walluf-Nendeln [= Walluf bei Weisbaden] : Sändig, 1975. - xlvi, 454 p. ; 22 cm. - (Beiträge zur Entwicklungsgeschichte der Maltechnik ; IV).
MIP: Pour grauer planches auec eau forte … [etc.] = Um Platten mit Scheidewasser zu ätzen … [etc.]. - P. 160–169.
ISBN 3-500-26660-6 (hardcover)
§ Photomechanical reprint of: München 1901 [No. 341.2].
NOT SEEN
In: UBA; UBG; VU.

341.6

Quellen für Maltechnik während der Renaissance und deren Folgezeit (XVI.-XVIII. Jahrhundert) in Italien, Spanien, den Niederlanden, Deutschland, Frankreich und England nebst dem De Mayerne Manuskript / (zum ersten Male hrsg., mit Übersetzung und Noten versehen) von Ernst Berger. - 2., unveränderter Neudruck. - Vaduz : Sändig, 1984. - xlvi, 454 p. ; 22 cm. - (Beiträge zur Entwicklungsgeschichte der Maltechnik ; IV).
MIP: Pour grauer planches auec eau forte … [etc.] = Um Platten mit Scheidewasser zu ätzen … [etc.]. - P. 160–169.
ISBN 3-500-26660-6 (hardcover)
§ Photomechanical reprint of: München 1901 [No. 341.2].
NOT SEEN
In: RMA; UBG.

341.7

Pictoria sculptoria & quae subalternarum artium, 1620. Le manuscrit de Turquet de Mayerne 1620–1646? / presenté par M. Faidutti et Camille Versini. - Lyon : Audin, [1970?]. - 166 p. : [4] pl. ; 22.5 cm.
MIP: Pour graver planches avec eau forte … [etc.]. - P. 50–54.
§ BL: '(1973)'.
Partial modern French translation of BL, Ms. Sloane 2052 [No. 341.1]. Originally published as a series of articles: M. Faidutti and C. Versini (ed.), 'Le manuscrit de Turquet de Mayerne', in *Peintures, pigments et vernis* (1965, 1966, 1967).
In: BL; RCE.

341.8

Theodor Turquet de Mayerne, Pittura scultura e delle arti minori 1620–1646 : Ms. Sloane 2052 del British Museum di Londra / a cura di Simona Rinaldi ; prefazione di Michele Cordaro. - Anzio : De Rubeis, 1995. - xi, 307 p. : [8] pl. ; 21 cm. - (Letteratura artistica ; 3).
MIP: Per incidere lastre con acqua forte … [etc.]. - P. 129–134.
ISBN 88-85252-30-3
§ Modern Italian translation of BL, Ms. Sloane 2052 [No. 341.1].
In: RCE.

U

Ulen (Paul V.)
See: **Lankes** (Julius John) [No. 179].

Upcott (William)
See: **Evelyn** (John) [No. 097.10].

V

Valuable secrets concerning arts and trades: or approved directions, from the best artists, for the various methods of engraving on brass, copper, or steel. Of the composition of metals. Of the composition of varnishes. Of mastichs, cements, sealing wax, &c. &c. Of the glass manufactory. Various imitations of precious stones, and french paste. Of colours and paintings, useful for carriage painters. Of painting on paper. Of compositions for limners. Of transparent colours. Colours to dye skins or gloves. To colour or varnish copperplate prints. Of painting on glass. Of colours of all sorts, for oil, water, and crayons. Of preparing the lapis lazuli, to make ultramarine. Of the art o. [sic!] gilding. The art of dying woods, bones, &c. The art of casting in moulds. Of making useful sorts of ink. The art of making wines. Of the composition of vinegars. Of liquors, essential oils, &c. Of the confectionary business. The art of preparing snuffs. Of taking out spots and stains. Art of fishing, angling, bird-catching, &c. And subjects curious, entertaining, and useful. Containing upwards of one thousand approved receipts relative to arts and trades / [preface by the ed.]. - London : printed and sold by Will. Hay, 1775. - [8], xxxiv, 312 p. ; 16.5 cm.
Contents: p. i.
MIP: pp. 1–9, 48, 54.
§ Drawn from various authors, p. [6]: 'The present work is a faithful compilation of various secrets and discoveries in the refined arts and trades: discoveries no way unworthy an Englishman's attention, as they spring from the first artists in France, Italy, and Germany.' P. [8]: 'The following approved Receipts are faithfully translated from the French, by a celebrated Foreigner; and several eminent Artists here have given great assistance towards rendering them easy to be understood by the most common capacity, especially those technical terms peculiar to the various Arts and Trades mentioned.'
BL: 'translated from the French'.
The preface is dated, p. [8]: 'Dec. 1, 1774'.
Related to: **Artist's assistant** (Birmingham 1773) [No. 014]; **Bowles** (London 1760) [045]; **Enfield** (London 1809) [No. 090].
1 –
Line Engraving / Line Etching / Relief Etching
2 –
Iron / Copper / Steel
3 –
Hand-colouring
4 –
Painting / Woodcut
In: BL (3×); NUC–1956; OCLC.

342.2

Valuable secrets concerning arts and trades : or, approved directions, from the best artists, for the various methods ... Containing upwards of one thousand approved receipts relative to arts and trades. - London ; Dublin : printed by J. Williams, 1778. - [8?], XXVII, 312 p. ; 17.5 cm.
§ NUC–1956: 'Translated from "Secrets concernant les arts et métiers"'.
NOT SEEN
In: NUC–1956; OCLC.

342.3

Valuable secrets in arts and trades : or, approved directions, from the best artists, for the bests methods of engraving ... &c. With other subjects curious, entertaining, and useful. Containing upwars of a thousand approved receipts relative to arts and trades. - The second [sic!] ed. - London : W. Hay, 1780. - [8?], XXXIV, 312 p. ; 17.5 cm.
§ NUC–1956: 'Faithfully translated from the French; dedicated to the Society of Artists'.
NOT SEEN
In: NUC–1956.

342.4

Valuable secrets in arts and trades : or, approved directions from the best artists for the various methods of engraving ... Containing upwards of one thousand approved receipts relative to arts and trades. - London : printed for J. Barker, J. Cattermoul, and J. Parsons, 1791. - VI, 351 p. ; 19 cm.
§ *Bridson & Wakeman*: 'The 1st chapter deals with the art of engraving, incl. etching and line engraving, and details of engraving methods for metal decoration unrelated to printmaking.'
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B8; NUC–1956; OCLC; *Singer & Strang 1897*: no. 68.

342.5

Valuable secrets in arts and trades; or, approved directions from the best artists. Containing upwards of 1000 approved receipts ... [etc.]. - A new ed. improved. - London : printed by and for J. Barker, [c. 1790?]. - IV, 351 p. ; 16 cm.
§ NUC–1956: '1758', but this edition was probably published in the early 1790s because the collation matches London 1791 [No. 342.4], and may even be the same edition.
NOT SEEN
In: NUC–1956.

342.6

Valuable secrets concerning arts and trades: or, approved directions, form the best artists, for the various methods of engraving on brass, copper, or steel. Of the composition of metals, and varnishes. Of mastichs and cements, sealing-wax, &c. ... [etc.]. - Norwich, Conn. : printed by Thomas Hubbard, 1795. - [2?], XXII, 240 p. ; 16.5 cm
NOT SEEN
In: BL; NUC–1956; OCLC.

342.7

Valuable secrets, concerning arts and trades, or, approved directions from the best artists, for the various methods of engraving on brass, copper, or steel. Of the composition of metals and varnishes. Of mastichs and cements, sealing-wax, &c. ... With an appendix, containing valuable

selections, in addition to, and never before published in this work. - Third American ed. - Boston, Mass. : from J. Bumstead's printing-office, 1798. - XXIV, 25–264 p. ; 17 cm.
NOT SEEN
In: NUC–1956; OCLC.

342.8

Valuable secrets in arts and trades: or, approved directions from the best artists, for the various methods of engraving on brass, copper, or steel. Of the composition of metals and varnishes. Of mastichs and cements, sealing-wax, &c. Of the glass manufactory, various imitations of precious stones, and French paste. Of colours and painting, for carriage-painters. Of painting on paper. Of compositions from limners. Of transparent colours. Colours to dye skins or gloves. To colour or varnish copper-plate prints. Of painting on glass. Of colours of all sorts for oil, water, and crayons. Of preparing the lapis lazuli, to make ultramarine. Of the art of gilding. The art of dying woods, bones, &c. The art of casting in moulds. Of making useful sorts of inks. The art of making wines. Of the composition of vinegars. Of liquors, essential oils &c. Of the confectionary business. Of taking out spots and stains. Art of fishing, bird-catching, etc. And other subjects, curious, entertaining, and useful. - A new ed. improved. - London : printed for J. Barker and J. Scatcherd, [c. 1799–1800?]. - V, [1], 351, [1] p. ; 8º.
Advertisement: p. [1], front and p. [1], back.
NOT SEEN
In: ESTC: no. 046162.

342.9

Valuable secrets in arts and trades: or, approved directions from the best artists. Containing, upwards of one thousand approved receipts … on the composition of varnishes … of the glass manufactory … of colours and painting, useful for carriage painters, of painting on paper, on compositions for limners ... the art of gilding … and other subjects, curious, entertaining, and useful. - A new ed. improved. - London : printed for J. Barker and J. Scatcherd, [1800?]. - V, [3], 351, [1] p. ; 8º
NOT SEEN
In: ESTC: no. 046162.

342.10

Valuable secrets in arts, trades, &c., selected from the best authors. And adapted to the situation of the United States ... [etc.]. - New York : published by Evert Duyckinck, 1809. - IV, 5–380, [20] p. ; 18.5 cm.
NOT SEEN
In: NUC–1956.

342.11

The artist's assistant, containing a choice selection of receipts from various authors principaly from the Valuable secrets of arts and trades : to which is prefixed a chymical treatise on the metals / Norman Mash. - Springfield, Mass. : [published by the author], 1810. - 72 p. ; 15.5–19 cm.
NOT SEEN
In: MET; OCLC.

342.12

Valuable secrets in arts and trades. Containing directions from the best artists, for calico printing, ... [etc.]. With above five hundred valuable modern receipts; forming a great variety of useful articles, collected form the latest European publications / by a Friend to American Manufacturers. - Boston, Mass. : published by J. Norman, 1814. - [2], XIV, 179 p. ; 8º
NOT SEEN
In: NUC–1956.

342.13

Valuable secrets in arts, trades, &c. selected from the best authors. And adapted to the situation of the United States ... [etc.]. - New York : published by Evert Duyckinck, 1816. - IV, 5–139 [= 317], [18] p. ; 16.5 cm.
§ NUC–1956: 'Page 317 erroneously numbered 139'.
NOT SEEN
In: NUC–1956; OCLC.

342.14

Secrets concernants les arts et métiers. - Paris : […], 1716. - 1 vol.
NOT SEEN
In: *Ferguson 1959*.

342.15

Secrets concernants les arts et métiers. - Paris : […], [1721?]. - 2 vol.
NOT SEEN
In: *Ferguson 1959*.

342.16

Secrets concernants les arts et métiers. - Avignon : Claude Delorme, 1751. - 2 vol.
NOT SEEN
In: *Ferguson 1959*; UBU.

342.17

Secrets concernants les arts et métiers. - Bruxelles : par la Compagnie, 1758. - 2 vol.
NOT SEEN
In: *Ferguson 1959*; UBN (vol. 2).

342.18

Secrets concernants les arts et métiers. - Bruxelles : par la Compagnie, 1766–1767. - 2 vol. ; 12º.
NOT SEEN
In: *Ferguson 1959*.

342.19

Secrets concernants les arts et métiers. - Paris : […], [1790–1791]. - 4 vol.
NOT SEEN
In: *Ferguson 1959*.

Secrets pour la gravure, les métaux, les vernis, les mastics, cimens, les pierres prétieuses, les couleurs et la peinture ; pour dorer, pour colorer le bois, les os, les yvoires, le vin, les liqueurs ... [etc.] . - [Paris?] : Serviere, An IX (1800–1801). - 2 vol. ; 8º.

MIP: vol. 1, pp. 138–140; vol. 2, pp. 105–108.

§ An IX = 23 Sep. 1800–22 Sep. 1801. It is uncertain whether this publication is part of the editions of the 'Secrets concernants les arts et métiers'.

3 –

Ink / Print behind Glass

In: RMA.

Secrets concernants les arts et métiers; ouvrage utile, non-seulement aux artistes, mais encore a ceux qui les emploient. - Paris : Serviere, An Neuf [1800–1801]. - 2 vol. ; 8º.

– Vol. 1: II, 356 p.

MIP: pp. 54–56.

– Vol. 2: 428 p.

MIP: pp. 106–106.

§ An IX = 23 Sep. 1800–22 Sep. 1801.

1 –

Line Engraving / Line Etching

2 –

Copper

3 –

Ink

In: RMA.

Secrets concernants les arts et métiers. - Nouvelle éd. Rev., cor., & considérablement augm. - Avignon : chez la Veuve Seguin, 1801. - 2 vol.

§ Nothing on intaglio printmaking.

In: Priv.Coll.

Van Dyck (Antonie)   343.1

[Notes on art technology and medicine] / [Antonie van Dyck]. - [Antwerpen], [c. 1630?]. - 90 fol. : drawings ; 21 cm.

MIP: fol. 4v, 6r.

§ Manuscript.

Language: Dutch.

Jaffé starts numbering the folia one leaf before the numbering in the ms. itself.

Fol. 1–6 (= 2–7) have been written, the other leaves are drawn and sketched.

The watermarks largely date to the 1590s. The text is in two different hands, most of it is in the hand of Antonie van Dyck.

Fol. 3 and 8 contain the same recipe for painting varnish, both written in Van Dyck's hand. A very similar recipe is found at the back of a drawing by Rembrandt van Rijn, but then it seems to be a recipe for stopping-out varnish, see: **Van Rijn** (Amsterdam 1655) [No. 344].

Fol. 5r contains a recipe for etching ground and how to apply it, written in Van Dyck's hand.

Title description after: London 1966 [No. 343.2].

1 –

Line Etching

In: DD.

343.2

Van Dyck's Antwerp sketchbook / Michael Jaffé. - London : Macdonald, 1966. - 2 vol. : ill. ; 32 cm.

– Vol. 1: Explanations, and comparative material. - 316 p. : CLXXI ill.

– Vol. 2: The Antwerp sketchbook. - 290 p. : [181] reprod.

MIP, stopping out (?): vol. 2, recto 2, recto 7 (reprod.), pp. 207, 210 (transcription), 212, 215 (English translation).

MIP, etching ground: vol. 2, recto 6 (reprod.), pp. 209–210 (transcription), 214–215 (English transl.).

§ Reproduces the pages of the sketchbook. With a transcription of the text and an English translation.

In: KB; RMA; UBA.

Van Rijn (Rembrandt)   344.1

River with trees / Rembrandt van Rijn. - [Amsterdam], [c. 1655]. - [1] fol. : drawing ; […] cm.

MIP: fol. [1]v.

§ Manuscript.

Language: Dutch.

The verso of the drawing contains a recipe for what is seen as a stopping-out varnish. The recipe has close resemblance to a recipe for painting varnish in Antonie van Dyck's Antwerp sketchbook, see: **Van Dyck** (Antwerpen 1630) [No. 343].

Title description after: New York 1979 [No. 344.2].

1 –

Line Etching

In: ML, inv. RF 4709.

344.2

The Rembrandt documents / Walter L. Strauss and Marjon van der Meulen ; with the assistance of S.A.C. Dudok van Heel and P.J.M. de Baar. - New York : Abaris, 1979. - 668 p. : ill. ; 32 cm.

MIP: pp. 478–479.

§ The transcription of supposedly a stopping-out varnish is on p. 478 and a reproduction of the recipe at the verso of the drawing is on p. 479.

In: KB; NCC; RMA; UBA.

Van Veen (Jacoba)
See: **Brugghen** (Gerard ter) [No. 050.3].

[Notes on etching] / D. Veersema [?]. - [S.l.], [c. 1920?].
In: **Roller** (Wien 1911) [No. 270.3]: 1, 64, back pastedown.
§ Manuscript.
Language: Dutch.
Pencil sketches on pp. 1 and 64 related to etching, a brief note on the back pastedown referring to Cadart in Paris as supplier of a roller press.
With *ex libris* of D. Veersema, front pastedown.
1 –
Line Etching
3 –
Press
In: Priv.Coll.

Velasco (Antonio Palomino de Castro y)
See: **Palomino de Castro y Velasco** (Antonio) [No. 230].

Veliz (Zahora)
See: **García Hidalgo** (José) [No. 115.4].

Etsen. Handboek voor de praktijk met afbeeldingen van etsen vanaf de zestiende eeuw tot heden / door Jan A[drianus] Verbruggen ; [coop. Dick van Luijn] ; met foto's van Hans Breedveld ; [diagrams Richards Studio] ; [advisor to the publisher Willem Snitker] ; [introd. Johannes M. van Lieshout]. - Amsterdam : Ploegsma, cop. 1981. - 224 p. : front., [159] ill. ; 26.5 cm.
Contents: p. 5.
Suppliers: p. 217.
Liteature: p. 223.
Stocklist: backflap.
ISBN 90-216-0851-0 (hardcover)
§ Title means: Etching. Manual for the practice with illustrations of etchings from the sixteenth century up to the present
The illustrations are diagrams, photographs and reproducutions.
Recipe A1 is taken from **Bosse** (Paris 1745) [No. 042.8]: 50 ('Vernis blanc de Rimbrandt').
1 –
Aquatint / Collagraph / Crayon Etching / Drypoint / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Aluminium / Copper / Iron / Linoleum / Plastic / Zinc
3 –
Blind Embossment / Counterproof / Press / Printing in Black
5 –
Conservation and Restoration
In: GBR; KABK; KB; KUB (2×); NBLC; NCC; OBA; PBL; Priv.Coll. (2×); RAA; RKD; RMA; UBA; UBG; UBR.

Konst, en Recept Boek, voor De Schilders en Konst Etzers &c: door tijt, en vlijt bij een gebragt / M.V.H, [= Mattheus Verheijden]. - in S. Hage [= Den Haag], 1736[–1739?]. - [4], p. 1–88, 95–260, 270–290, [291]–[322] : [3] diagrams ; 11 × 17 cm.
MIP: pp. 95–146, 171–172 : [1] diagram.
Suppliers: pp. [1], 121, 143, 171.
Address of plate printer: p. 172.
Contents: pp. [328]–[332].
With literature.
§ Title means: Art, and recipe book, for painters and art etchers etc.: gathered through time and diligence.
Manuscript.
Language: Dutch.
The paging jumps from '260' on the left to '270' on the right of an opening without any folia missing in between. An unknown number of folia of which little more than small stubs are left is cut out between p. [327] and p. [328].
Pp. 95–146: recipes for etching ground and stopping-out, after Bosse and Lairesse; pp. 171–172: instructions for mezzotint, partly after Lairesse;
Bosse (Amsterdam 1662) [No. 042.26]; **Lairesse** (Amsterdam 1707) [No. 177].
1 –
Line Etching / Mezzotint
2 –
Copper
4 –
Painting
5 –
Conservation and Restoration
In: RMA, 319 H 17.

Vernon-Morris (Hebe)
See: **D'Arcy Hughes** (Ann) & **Vernon-Morris** (Hebe) [No. 071].

<div align="right">Vial (C.C.) & Nieuwendijk (M.H.H.) 348</div>

Grafische technieken / C.C. Vial, M.H.H. Nieuwendijk ; fotografie Ger van Vegte ; tekeningen C.C. Vial. - Amsterdam : Duwaer, [c. 1974]. - 63, [1] p. : reprod., diagrams ; 20–21 cm. - (Beeldende vorming).
MIP: pp. 54–59.
Literature: p. 62.
Contents: p. [1].
ISBN 90-294-2198-3 (hardcover)
§ Title means: Graphic techniques
Intended audience, p. 3: 'Dit boek wil een handboek zijn voor diegenen, die zich in school- of klubverband, thuis of anderszins met eenvoudige grafische technieken bezig houden.'
1 –
Drypoint / Line Etching
2 –
Cardboard / Copper / Iron / Plastic / Wood / Zinc
3 –
Printing in Black
4 –
Lithography / Monotype / Rubbing / Screen Printing / Woodcut
5 –
Conservation and Restoration
In: ATH; GBR; KB; NBLC; NCC; PBM; Priv.Coll.

<div align="right">Villon (A.-Mathieu)   349.1</div>

Nouveau manuel complet du graveur en creux et en relief : contenant les procédés anciens et modernes de la gravure en creux, à l'eau-forte, en taille-douce, de l'heliogravure, de la gravure de la topographie, de la musique, de la gravure en relief sur bois et sur métal, de la photogravure, de la similigravure, des procédés divers de gravure chimique et photographique du clichage des gravures, de la gravure sur pierre en relief : suivi de la fabrication du papier-monnaie, des timbres-poste et des cartes à jouer / par A.-M[athieu] Villon ; [ill. by Dietrich, L. Charpentier]. - Paris : Roret, 1894. - 2 vol. : [132] ill., [4] pl. ; 12º. - (Manuels Roret).
§ Vol. 1, p. 4: 'Avis: Divers articles du *Manuel du Graveur*, ancienne édition, par MM. Perrot et Malepeyre, ont été conservés et insérés dans le tome premier du Manuel de M. Villon, qui le remplace avantageusement'; see **Perrot** (Paris 1830). Villon added information on a large number of modern intaglio printmaking techniques, for which reason his work is seen as a new and independent publication.
Photomechanical reprint: Paris 1980.
– Vol. 1: (iv), 360 p. : [2] pl., 83 fig.
– Vol. 2: (iv), 316, 52 p. : 44 fig.
NOT SEEN
In: BL; *Blas Benito 1994*: 71; BLBS; BN; MET; NUC–1956.

<div align="right">349.2</div>

Nouveau manuel complet du graveur en creux et en relief : contenant les procédés anciens et modernes de la gravure en creux, à l'eau-forte, en taille-douce, de l'heliogravure, de la gravure de la topographie, de la musique, de la gravure en relief sur bois et sur métal, de la photogravure, de la similigravure, des procédés divers de gravure chimique et photographique du clichage des gravures, de la gravure sur pierre en relief : suivi de la fabrication du papier-monnaie, des timbres-poste et des cartes à jouer / par A.-M[athieu] Villon ; [ill. van Dietrich, L. Charpentier]. - Nouvelle [2nd] éd., rev. et cor. - Paris : Mulo, 1914. - 2 vol. : 134 ill., [2] reprod. ; 15.5 cm. - (Manuels Roret).
– Vol. 1: [4], 388 p. : fig. 1–89, [2] reprod.
Stocklist: p. [2].
MIP: pp. 1–198, 343–381 : fig. 1–40, [2] reprod.
Contents: p. 383.
Advertisement: p. 388.
– Vol. 2: [4], 304 p. : fig. 90–134.
Stocklist: p. [2].
Contents: p. 299.
Advertisement: p. 303.
§ *Fig*. 90 is a reproduction.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Ruling Machine / Stipple Engraving / Soft-ground
2 –
Aluminium / Bronze / Copper / Steel / Zinc
4 –
Line Block / Lithography / Woodcut / Wood Engraving
5 –
Aesthetics / Art History
In: *Blas Benito 1994*: 71; BLBS; BN; *Figueras Ferrer 1992*: 1073; NUC–1956; OCLC; Priv.Coll.

<div align="right">349.3</div>

Nouveau manuel complet du graveur en creux et en relief : contenant les procédés anciens et modernes de la gravure en creux, à l'eau-forte, en taille-douce, de l'heliogravure, de la gravure de la topographie, de la musique, de la gravure en relief sur bois et sur métal, de la photogravure, de la similigravure, des procédés divers de gravure chimique et photographique du clichage des gravures, de la gravure sur pierre en relief : suivi de la fabrication du papier-monnaie, des timbres-poste et des cartes à jouer / par A.-M[athieu] Villon ; [ill. by Dietrich, L. Charpentier]. - Nouvelle [3rd]

éd., rev. et cor. - Paris : Mulo, 1924. - 2 vol. : fig. reprod. ; 15.5 cm.
§ The *figures* are diagrams.
– Vol. 1: Tome premier. - [4], 388 p. : [2] reprod., fig. 1–89.
Stocklist: p. [2].
MIP: pp. 1–199, 343–381 : fig. 1–40.
Contents: p. 383.
With literature.
– Vol. 2: Tome second. - [6], 320 p. : fig. 90–135.
Stocklist: p. [4].
Contents: p. 309.
Advertisement: p. 313.
With literature.
§ *Fig*. 90 is a reproduction.
In: BN; BNL; NCC; NUC–1956; UBA.

349.4

Nouveau manuel complet du graveur en creux et en relief ... [etc.] / par A.-M[athieu] Villon. - [Paris] : Léonce Laget, 1980. - (Manuels-Roret).
§ Photomechanical reprint: Paris 1894. But see ULC: '1978'; reprint of the edition 'Paris 1914'.
NOT SEEN
In: Priv.Coll.; ULC.

Visscher (Claes Jansz.)
See: **Brugghen** (Gerard ter) [No. 050].

W

Watson (Ernest William)
See: **Lankes** (Julius John) [No. 179].

Wax (Carol)   350.1
The mezzotint : history and technique / by Carol Wax ; project director Robert Morton ; ed. Harriet Whelchel. - New York : Abrams, 1990. - 296 p. : [336] ill., of which [27] in colour ; 28.5 cm.
Contents: p. 6.
MIP: pp. 169–281 : [81] ill., of which [16] in colour.
Suppliers: p. 282.
Literature: p. 283.
Index: p. 289.
ISBN 0-8109-3603-8 (hardcover)
§ The illustrations are diagrams, photographs, reproductions and schemes.
Review: M. Balakjian, in *Printmaking Today*, 1 (1990/1991) 1: 35.
Review: E. D'Oench, 'The Mezzotint', in *Print Quarterly*, 8 (1991) 2: 193.
Review: R. Godfrey, in *The Burlington Magazine*, 133 (1991) 1058: 328.
Review: E. McSherry Fowble, in *Winterthur Portfolio*, 26 (1991) 2/3: 184–186.
1 –
Aquatint / Drypoint / Photomechanical Etching / Line Engraving / Line Etching / Mezzotint / Soft-ground / Stipple Engraving
2 –
Aluminium / Brass / Copper / Steel / Steelfacing / Zinc
3 –
Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Troubleshooting
5 –
Art History / Conservation and Restoration
In: *Blas Benito 1994*: 89; DBI-VK; GBR; KB; NCC; OBA; OCLC; Priv.Coll. (2×); RAA; RMA; SBB; UBA; UBG; UBH; UBL-KHI; UBU.

350.2

The mezzotint : history and technique / by Carol Wax ; project director Robert Morton ; ed. Harriet Whelchel. - London : Thames and Hudson, 1990. - 296 p. : [336] ill., of which [27] in colour ; 28.5 cm.
Contents: p. 6.
MIP: pp. 169–281 : [81] ill., of which [16] in colour.
Suppliers: p. 282.
Literature: p. 283.
Index: p. 289.
ISBN 0-500-23583-X (hardcover)
In: DBI-VK; GBR; KSM; NCC; OCLC; PBM; UBU; ULC.

350.3

The mezzotint : history and technique / by Carol Wax ; project director Robert Morton ; ed. Harriet Whelchel. - New York : Abrams, 1996. - 296 p. : [336] ill., of which [27] in colour ; 26 cm.
Contents: p. 6.

MIP: pp. 169–281 : [81] ill., of which [16] in colour.
Suppliers: p. 282.
Literature: p. 283.
Index: p. 289.
ISBN 0-8109-2649-0 (softcover)
§ Softcover issue of the edition: New York : Abrams, 1990 [No. 350.1].
In: KVK.

Waye (J.C. Gaal du)
See: **Bosse** (Abraham) [No. 042.10].

Wecker (Johann Jakob)
See: **Alessio Piemontese** [No. 007].

Welden (Dan) & **Muir** (Pauline)   351
Printmaking in the sun, an artist's guide to making professional-quality prints using the solarplate method / Dan Welden, Pauline Muir. - New York : Watson-Guptill, 2001. - 144 p. : [214] ill. ; 27 cm.
Resources: p. 137.
Glossary: p. 138.
Literature: p. 141.
Suppliers: p. 142.
§ The illustrations are diagrams, photographs and reproductions.
See also: **Muir** (1999) [No. 527].
2 –
Glass / Plastic / Photopolymer Plate
3 –
Blind Embossment / Chine Collé / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Troubleshooting
5 –
Health and Safety
In: Priv.Coll.

Wenniger (Mary Ann)   352
Collagraph printmaking / by Mary Ann Wenniger ; photogr. by Mace Wenniger … [et al.]. - New York : Watson-Guptil ; London : Pitman, 1975. - 184 p. : front., [337] ill., of which [12] in colour ; 29 cm.
Contents: p. 7.
Suppliers: p. 172.
Glossary: p. 181.
Literature: p. 182.
Index: p. 183.
ISBN 0-273-00904-4 (Pitman, hardcover)
ISBN 0-8230-0665-4 (Watson-Guptil, hardcover)
§ The illustrations are photographs and reproductions.
1 –
Collagraph
3 –
Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
5 –
Conservation and Restoration
In: *Figueras Ferrer 1992*: 1075; Priv.Coll. (2×); SBH; UBA.

Werner (Jerzy)   353
Technika i technologia sztuk graficznych / Jerzy Werner ; [opracowanie redakcyjne i techniczne Henryk Babral]; [okladkę i obwolutę projektował Jerzy Werner]. - Kraków : Wydawnictwo Literackie, 1972. - 332 p. : 118 b/w ryc., VIII colour tab. ; 20.5 cm.
MIP: pp. 77–144, 231–232, 236, 299–300 : b/w ryc. 38–75, colour tab. V.
Polyglot: p. 312.
Literature: p. 320.
List of illustrations: p. 324.
Contents: p. 330.
§ Title means: Technique and technology of graphic arts
The polyglot is Polish–French–German–English.
1 –
Aquatint / Collograph / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Stipple Engraving / Soft-ground
2 –
Copper / Glass / Plastic / Steel
3 –

Ink / Multiple-plate Printing / Paper / Printing in Black /
4 –
Gypsum Cut / Linocut / Lithography / Monotype / Photography / Rotogravure / Screen Printing / Woodcut / Wood Engraving
5 –
Art History / Conservation and Restoration
In: BNW; OCLC; UJK.

West (Levon)   354.1

Making an etching / by Levon West ; photographic ill. by Lazarnick, New York. - [1st ed.]. - London : The Studio ; New York : The Studio Publications, 1932. - 79 p. : [17] photogr., [16] reprod. ; 25.5 cm. - (How to do it series ; 1).
Titles in the series: p. 2.
Contents: p. 5.
List of illustrations: p. 5.
Literature: p. 11.
Suppliers: p. 15.
§ Most catalogues do not differentiate between the first edition [No. 354.1] and the reprint of the same year [No. 354.2].
Illustrated with actual, tipped-in photographs.
1 –
Line Etching
2 –
Copper
3 –
Press / Printing in Black
5 –
Art History
In: BL; *Blas Benito 1994*: 89; BLBS; BN; CCB; *Figueras Ferrer 1992*: 1075; KABK; MET; NCC; NUC–1956; OCLC (18×); PBL; Priv.Coll. (2×); SPKA; UBL-KHI; UBU; ULC.

354.2

Making an etching / by Levon West ; photographic ill. by Lazarnick, New York. - Repr. [2nd] ed. - London : The Studio ; New York : The Studio Publications, 1932. - 79 p. : [33] ill. ; 25.5 cm.
Titles in the series: p. 2.
Contents: p. 5.
List of illustrations: p. 5.
Literature: p. 11.
Suppliers: p. 15.
§ 'Reprinted edition, October 1932'.
Illustrated with actual, tipped-in photographs.
Perhaps issued with two different covers.
In: Priv.Coll. (2×); UBU.

354.3

Making an etching / by Levon West ; photographic ill. by Lazarnick, New York. - Repr. [3rd ed.]. - London ; New York : The Studio Publications, 1947. - 79 p. : 17, 20 ill. ; 25.5 cm.
Titles in the series: p. [2].
Contents: p. 5.
List of illustrations: p. 6.
Suppliers: p. 14.
Stocklist: backside cover.
§ The text is identical, but reset.
With a different illustration on the front cover. The photographs and reproductions of the earlier editions are reproduced in autotype, but also tipped in. With four extra reproductions.
In: *Blas Benito 1994*: 89; CCB; NUC–1956; OCLC (17×); Priv.Coll.; TUD.

West Padgett (H.)
See: **Padgett** (H. West) [No. 227].

Whale (George) & **Barfield** (Naren) 355.1

Digital printmaking / George Whale & Naren Barfield. - London : A&C Black, 2001. - 128 p. : [114] colour ill. ; 23.5 cm. - (Printmaking handbooks).
MIP: pp. 68–78 : [14] ill.
Glossary: p. 113.
Literature: p. 122.
Suppliers: p. 122.
List of URLs: p. 124.
Index: p. 126.
1 –
Photomechanical Etching
2 –
Copper / Zinc
3 –
Chine Collé
4 –

Digital Printmaking / Lithography / Screen Printing
NOT SEEN
In: BL; COPAC.

355.2

Digital printmaking / George Whale & Naren Barfield. - New York : Watson-Guptill, 2003. - 128 p. : [114] colour ill. ; 23.5 cm. - (Printmaking handbooks).
In: LC; Priv.Coll.

Winkler (Betty)   356

Carborundum collagraph printmaking / Betty Winkler. - New York : Yama Prints, cop. 1995. - [2], 18 p. : [2] ill. ; 22 cm.
Glossary: p. 18.
§ Yama Prints is a printmaking studio.
The illustrations are pasted-in photocopies.
The author expected to produce a full-length book on the subject but this project was never realised; letter of 24 November 1999; email of 26 August 2010.
1 –
Carborundum Print / Collagraph / Drypoint / Mezzotint
2 –
Cardboard / Plastic
3 –
Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome / Viscosity Colour Printing
In: Priv.Coll.

Witgeest (Simon)   357.1

Het nieuw toneel der konsten, bestaande uyt sesderley stukken: het eerste, handelt van alderley aardige speeltjes en klugjes: het tweede, van de verligt-konst in 't verwen en schilderen: het derde, van het etzen en plaat-snijden: het vierde, van de glas-konst: het vijfde, heeft eenige aardige remedien tegen alderley ziekten: het sesde, is van de vuur-werken / uyt verscheyde autheuren by een vergadert, door S[imon] Witgeest. - [1st ed.]. - Amsterdam : by Jan ten Hoorn, 1679. - [8] p., p. 1–64, 63–69, 80–104, 97–344 p. : vign., [26] woodcuts ; 15.5 cm.
MIP: Het derde deel. Van het etsen en koper-plaet-snyden. - P. 167–206 : [2] woodcuts.
§ Title means: The new theatre of arts, consisting of six pieces: the first, deals with all kinds of nice games and plays: the second, of illuminating in limning and painting: the third, of etching and engraving: the fourth, of glassmaking: the fifth, has some fine remedies against all kinds of diseases: the sixth, is of fire-works
The part on etching is taken from the Dutch translation of Bosse; **Bosse** (Amsterdam 1662) (no. 042.26).
Simon Witgeest is perhaps a pseudonym of Willem Goeree; see the edition Leiden 1967, pp. 70–71.
The paging is erratic, see the collation.
The book was very popular with 17 editions and two pirated versions with unknown edition numbers up to 1830, and an 18th-century German translation with 15 editions. With this first edition the compiler had more serious intentions, but from the second edition onwards the publisher concentrated more on the amusement aspects and the book became a collection of games and riddles. This left just a few pages on etching, with no instructive intentions, for which reason only the first edition and its facsimile are described.
Photomechanical reprint: Leiden 1967.
1 –
Échoppe / Line Etching
2 –
Copper
In: UBA.

357.2

Het nieuw toneel der konsten, bestaande uyt sesderley stukken: het eerste, handelt van alderley aardige speeltjes en klugjes: het tweede, van de verligt-konst in 't verwen en schilderen: het derde, van het etzen en plaat-snijden: het vierde, van de glas-konst: het vijfde, heeft eenige aardige remedien tegen alderley ziekten: het sesde, is van de vuur-werken / uyt verscheyde autheuren by een vergadert, door S[imon] Witgeest ; met een epiloog van John Landwehr. - Facsimile-uitgave. - Leiden : Sijthoff, 1967. - [10], 344, [2] p. : vign., [26] ill. ; 16.5 cm.
MIP: Het derde deel. Van het etsen en koper-plaet-snyden. - P. 167–206 : [2] ill.
List of titles in the series: backflap.
§ The paging is continuous.
Photomechanical reprint of: Amsterdam 1679.
Review: *Intergrafia*, 17 (1967) 41: 909.
In: CCB; KB; Priv.Coll. (2×); RCE; UBA (3×).

Witsen (Willem Arnold)   358

Etskunst. Eene uitleg / Willem Arnold Witsen. - [Amsterdam], [c. 1900?].
§ Not found as a monograph – perhaps an article or a manuscript.
Reference in an object shown in the exhibition of Witsen's works at RAA in 2005.
NOT FOUND
In: present whereabouts unknown.

Woodman (Richard J.) 359.1

Wood engraving techniques on new polymers : a 'how to' manual / Richard J. Woodman ; [ill. by Richard J. Woodman]. - Menlo Park, CA : Woodman, 1996. - [...] p. : ill. ; 28 [?] cm.
§ Concerns relief printmaking only.
NOT SEEN
In: Worldcat.

Engraving on Resintaglio / Richard J. Woodman ; [ill. by Richard J. Woodman]. - Beaverton, Or. : Woodman, 1996. - […] p. : ill. ; 28 [?] cm.
§ Concerns intaglio printmaking only.
Email from Catherine Kumlin of McClain of 03 August 2006: 'Resintaglio was basically unmounted Resingrave that was colored so intaglio printmakers could carve into it and see their marks more easily than they could on copper. However the product was discontinued because Mr. Woodman discovered that you could polish Resingrave, paint the surface and use it for intaglio in the same way.'
NOT SEEN

How to do wood engraving and intaglio printmaking on Resingrave blocks / Richard J. Woodman ; [ill. by Richard J. Woodman]. - Beaverton, Or. : Woodman, 2005. - 30 p. : ill ; 28 cm.
§ Combination of both above titles.
NOT SEEN

Relief & intaglio printmaking methods on Resingrave blocks / by Richard J. Woodman ; [ill. by Richard J. Woodman]. - [Rev. ed.]. - Beaverton, Or. : Woodman, 2006. - [2], 30 p. : 45, [3] fig. ; 28 cm.
Contents: p. [1].
MIP: pp. 20–26 : fig. 34–45.
Glossary: p. 27.
Suppliers: p. 29.
§ Revised edition with different figures, new cover and new title.
The figures are diagrams, photographs and reproductions.
Email from Catherine Kumlin of McClain of 3 August 2006: 'Originally the book was called *Wood Engraving Techniques on New Polymers,* and we offered that title from 1996 until 2005. In 2000, Mr. Woodman wrote a second book, *Engraving on Resintaglio*. (Resintaglio was basically unmounted Resingrave that was colored so intaglio printmakers could carve into it and see their marks more easily than they could on copper. However the product was discontinued because Mr. Woodman discovered that you could polish Resingrave, paint the surface and use it for intaglio in the same way.) In 2005, he combined the two books, revised it extensively and renamed it *How To Do Engraving and Intaglio Printmaking on Resingrave Blocks.* Then just this last month, he added more material, re-shot several of the photos, changed the cover and renamed it again.'
1 –
Line Engraving
2 –
Plastic
3 –
Printing in Black
4 –
Wood Engraving
In: Priv.Coll.; Worldcat.

The craft of etching and lithography / Gerald Woods. - London : Blanford Press, 1965. - 76 p. : [45] ill., of which [6] in colour : 22.5 cm.
List of prints: p. 6.
Contents: p. 7.
MIP: pp. 24–39, 63–69 : [14] ill., of which [3] in colour.
Literature: p. 73.
Glossary: p. 75.
Index: p. 76.
Stocklist: backflap and cover backside.
§ The illustrations are diagrams, photographs and reproductions.
Intended audience, p. 9: 'This small book is addressed primarily to the student of Fine Prints, and to the amateur printmaker.'
1 –
Aquatint / Drypoint / Lift-ground / Line Engraving / Line Etching / Relief Etching
2 –
Iron / Copper / Linoleum / Steel / Zinc
3 –
Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome / Relief Printing / Viscosity Colour Printing
4 –
Lithography
5 –
Art History / Original and Reproduction
In: BL; *Blas Benito 1994*: 89; BLBS; BNB50; NCC; OCLC (15×); Priv.Coll. (2×); UBA; ULC.

Practical printmaking : the complete guide to the latest techniques, tools and materials / Louise Woods (ed.). - London : Apple, [1996]. - 160 p. : ill., partly in colour ; 29 cm. - (A Quintet book).
ISBN 1-85076709-2
§ Aimed at the amateur printmaker.
Martin (Judy) [No. 202] is similar in style and has a number of prints in common, too.
NOT SEEN
In: BL; BLO; KVK.

Practical Printmaking : the complete guide to the latest techniques, tools and materials / Louise Woods (ed.). - London : Batsford, 2003. - 160 p : colour ill ; 28 cm.
Includes index.
ISBN: 0-71348830-1
NOT SEEN
In: BLO; KVK.

Handboek druktechnieken : een complete handleiding met de nieuwste technieken, gereedschappen en materialen / Louise Woods (ed.) ; [transl. Marjan Faddegon-Doets]. - Baarn : Cantecleer, 2003. - 160 p. : ill. ; 29 cm.
MIP: pp. 63–96 : ill.
Glossary: p. 152.
Index: p. 157.
ISBN 90-213-3386-4 (hardcover)
§ Translation of: London [1996].
1 –
Aquatint / Drypoint / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching
2 –
Copper / Zinc
3 –
Ink / Paper / Printing in Black
4 –
Lithography / Monotype / Relief Printing / Screen Printing
In: KB.

Woods 2 (Louise)　　362

The printmaking handbook : simple techniques and step-by-step projects / Louise Woods ; ed. Donna Gregory. - London : Quintet, 2008. - 192 p. : [400] colour ill. ; 20.5 cm. - (A Quintet book).
Contents: p. 5.
MIP: pp. 76–115 : [97] ill.
Glossary: p. 184.
Index: p. 188.
ISBN 978-1-84448-379-2 (loose sheeets in spiral binding)
§ The edition is published by Search Press Ltd (Turnbridge Wells) and copyright is with Quintet Publishing Ltd.
The illustrations are diagrams, photographs and reproductions. The illustrations in this publication previously appeared in **Woods 1** (1996) [No. 361].
1 –
Aquatint / Collagraph / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground
2 –
Copper / Zinc
3 –
Ink / Multiple-plate Printing / Printing à la Poupée / Printing in Black / Printing Polychrome
4 –
Lithography / Monotype / Relief Printing / Screen Printing
5 –
Conservation and Restoration
In: Priv.Coll.

Woolliscroft Rhead (George)
See: **Rhead** (George Woolliscroft) [No. 264].

Wright (John Buckland)
See: **Buckland-Wright** (John) [No. 053].

X

X.B. (A.)
See: **A.X.B.**

Y

York (Emily)　　363

Magical secrets about aquatint : spit bite, sugar lift and other etched tones, step-by-step / by Emily York. - San Francisco : Crown Point, 2008. - 364 p. : ill. in colour + CD-ROM ; (?) cm.

§ Review: M. Fishpool, *Printmaking Today*, 18 (2009) 1: 34.
1 –
Aquatint / Lift-ground
NOT SEEN
In: Worldcat.

Yrubslips (F.)
See: **Spilsbury** (Francis B.) [No. 317].

Z

Zaidenberg 1 (Arthur)   364.1
Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [1st printing]. - New York : Crown, 1942. - 288, [15] p. : [260] b/w ill., 15 colour pl. ; 28 cm.
Contents: p. 5.
MIP: pp. 168–203 : [35] ill.
§ The 1965 edition includes a list of all the printings of the first edition of 1942 on p. 4: 1942 (first published), 1942, 1943, 1944, 1944, 1944, 1945, 1945, 1946, 1947, 1948, 1948, 1949, 1950, 1952, 1954, 1957, 1960. The 19th printing of 1965 is a revised edition.
NOT SEEN
In: CCB; NUC–1956; NYPL.

364.2
Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [2nd printing]. - New York : Crown, 1942.
NOT SEEN

364.3
Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [3rd printing]. - New York : Crown, 1943.
NOT SEEN

364.4
Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [4th printing]. - New York : Crown, 1944.
NOT SEEN

364.5
Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [5th printing]. - New York : Crown, 1944.
NOT SEEN

364.6
Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [6th printing]. - New York : Crown, 1944.
NOT SEEN

364.7
Anyone can paint! Practical instruction in the various media of art: oil painting, water-color, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - Sixth [sic! = 7th] printing. - New York : Crown, 1945.
NOT SEEN
In: DBI-VK; NUC–1956.

364.8
Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [8th printing]. - New York : Crown, 1945.
NOT SEEN

364.9
Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [9th printing]. - New York : Crown, 1946.
NOT SEEN

364.10
Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - Tenth printing. - New York : Crown, 1947. - 288, [15] p. : [260] b/w ill., 15 colour pl. ; 27.5 cm.
Contents: p. 5.

MIP: pp. 168–203 : [35] ill.
§ Intended audience, p. 13: 'the unschooled artist'.
1 –
Drypoint / Line Etching
2 –
Copper / Zinc
3 –
Press / Printing in Black
4 –
Drawing / Linocut / Painting / Lithography / Woodcut / Wood Engraving
5 –
Aesthetics / Art History
In: BL; Priv.Coll.

364.11

Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [11th printing]. - New York : Crown, 1948.
NOT SEEN

364.12

Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [12th printing]. - New York : Crown, 1948.
NOT SEEN

364.13

Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [13th printing]. - New York : Crown, 1949.
NOT SEEN

364.14

Anyone can paint! Practical instruction in the various media of art: oil painting, water-color, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - Fourteenth printing. - New York : Crown, 1950. - 288, [15] p. : front., ill., pl., partly in colour ; 28 cm.
NOT SEEN
In: OCLC.

364.15

Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [15th printing]. - New York : Crown, 1952.
NOT SEEN

364.16

Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [16th printing]. - New York : Crown, 1954.
NOT SEEN

364.17

Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - [17th printing]. - New York : Crown, 1957.
NOT SEEN

364.18

Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - Seventeenth [sic! = 18th] printing. - New York : Crown, 1960. - 288, [15] p. : [260] b/w ill., 15 colour pl. ; 27.5 cm.
Contents: p. 5, backside cover.
MIP: pp. 168–203 : [35] ill.
In: Priv.Coll.

364.19

Anyone can paint! Practical instruction in the various media of art: oil painting, watercolor, mural painting, tempera, woodcut, etching, pencil, pen and ink, pastel, linoleum block, lithography, etc. New techniques such as roller, spray, and chemical painting / by Arthur Zaidenberg ; introduction by Burton Jones ; special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman. - Rev. ed., nineteenth printing. - New York : Crown, 1965. - 299 p. : [265] b/w ill., 16 colour pl. : 28 cm.
Contents: p. 5.
MIP: pp. 168–203 : [35] ill.
§ With additional information about painting techniques and a few more illustrations.
In: LC (2×); OCLC.

364.20

Manual gráfico y técnico de la pintura / A. Zaidenberg ; [special articles by Chris Ritter, Nathaniel Dirk, and Aaron Berkman]; introduccion por Burton Jones ; traducción de Elena Uriburu. - Buenos Aires : Centurión, [1945]. - 319 p. : front., [250] b/w ill., [17] colour pl. ; 28 cm. - (Colección Arte).
Stocklist: p. 4.

MIP: pp. 125–142 : fig. 71–82.

Contents: p. 317.

§ Perhaps a translation of the edition: New York 1944.

With a number of the original illustrations deleted and some extra in the additional chapter; a number of illustrations have been reduced in size.

With additional articles for the Argentinian edition, but not on printmaking.

In: BNM.

New encyclopedia of drawing, painting and the graphic arts. A complete fundamental book of instruction for hobbyists, art students, and professional artists / Arthur Zaidenberg. - New York : Barnes ; London : Yoseloff, 1961. - 222 p. : ill. ; 26 cm.

NOT SEEN

In: BL; OCLC.

Prints and how to make them: graphic arts for the beginner / by Arthur Zaidenberg ; [introd. by Letterio Calapai]. - New York ; Evanston ; London : Harper & Row, cop. 1964. - 173 p. : [152] ill. ; 28 cm.

List of works by the author: p. 2.

Contents: p. 7.

MIP: pp. 69–114 : [39] ill.

Glossary: p. 168.

§ Title on cover: Prints and how to make them: graphic arts for the beginner. Techniques in woodcut, drypoint, linoleum block, etching, monotype, lithography, silkscreen, etc., including some new processes developed by the author

The preface is dated, p. 10: '1963'.

The illustrations are diagrams, photographs and reproductions.

1 –

Aquatint / Drypoint / Line Etching / Mezzotint / Soft-ground

2 –

Aluminium / Copper / Plastic / Zinc

3 –

Printing in Black

4 –

Linocut / Lithography / Monotype / Photography / Rubbing / Screen Printing / Wood Engraving / Woodcut

In: BL; OCLC; Priv.Coll.; ULC.

Zambrano (Ana Bellido)

See: **Bellido Zambrano** (Ana) [No. 028].

Zeising (Heinrich)

See: **Zonca** (Vittorio) [No. 368].

Die Techniken des Tiefdruckes mit besonderer Berücksichtigung der manuellen, künstlerischen Herstellungsverfahren von Tiefdruckplatten jeder Art. Zur Benutzung für Graphiker, Malerradisten und Kunstfreunde / hrsg. von Walter Ziegler. - [1st ed.]. - Halle an der Saale : Knapp, 1901. - XII, 191, [3] p. : 80, [1] Fig., II Tiefdruck-Beilagen + 25 Originaldrucke ; 24–25.5 cm.

Contents: p. IX.

Advertisement: p. [2] at the back.

§ Title means: The techniques of intaglio printmaking with special attention to the manual artistic production of intaglio printing plates in all kinds of manner. To be used by printmakers, painter-etchers and art friends

The *Figuren* are diagrams, photographs and reproductions. The two *Tiefdruck-Beilagen* or *Strich- und Tonproben* contain 2 × 9 specimens and are bound in between pp. II and III.

Intended audience, title page, see also p. VIII: 'Zur Benutzung für Graphiker, Malerradisten und Kunstfreunde'.

With the following edition the manual is split in two parts that are published separately, thus not in the same years. This first edition was about intaglio printmaking only, after which volume 1 concerned printmaking in b/w and volume 2 about printmaking in colour, both in various manual graphic processes. To avoid any confusion, below all editions of volume 1 are described first and next all editions of volume 2.

– Added specimens: 25 Originaldrucke von Platten in den verschiedenen Techniken des Tiefdruckes / gearbeitet und zusammengestellt von Walter Ziegler ; mit Unterstützung der Gesellschaft zur Förderung deutscher Wissenschaft, Kunst und Litteratur in Böhmen. - München, 1901. - [4] p. : 25 pl. ; 36.5 cm.

§ Title means: 25 original prints of plates in the various intaglio printmaking techniques

P. [2]: 'Diese Mappe soll als Ergänzung dienen zu dem Schriftwerke "Die Techniken des Tiefdruckes" von Walter Ziegler (Druck und Verlag von Wilhelm Knapp, Hall a. S.). Um ein zuverlässiges Anschauungsmittel für die verschiedenen Herstellungsverfahren von Tiefdruckplatten zu geben, arbeitete ich Platten, bei welchen immer nur eine bestimmte Technik in Anwendung kam. Die Drucke wurden bei der rühmlichst bekannten Firma O. Felsing Grossherzogl. Badische und Sächs. Weimarische Hofkunst-Kupferdruckerei in Berlin S.-W., Schönebergstrasse 8 hergestellt. Durch Verwendung verschiedenartigster Druckpapiere und Druckfarbe wurde eine reiche Abwechselung angestrebt.'

Printed in different colours (black, red, cream, brown, blue) on different kinds and colours of paper. See also: **Felsing** (Berlin 1920) [No. 099].

Ziegler still offered this portfolio with specimens for sale in the edition (Halle 1923) 1: 331 [No. 367.4].

1 –

Aquatint / Crayon Engraving / Drypoint / Electrolytic Etching / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground / Stipple-engraving

2 –

Copper / Gelatin / Iron / Plastic / Steel / Zinc

3 –

Casting / Counterproof / Ink / Multiple-plate Printing / Paper / Press / Printing à la Poupée / Printing in Black / Printing Monochrome / Printing Polychrome
5 –
Original and Reproduction
In: ABK (with the portfolio with specimens); BL; *Blas Benito 1994*: 90; BLBS; CCB; DBSM; *Figueras Ferrer 1992*: 1076; HAB; HAUM; KB; KSM; RAL; SBB; UBAB (with the portfolio with specimens).

<div align="right">367.2</div>

Die manuellen graphischen Techniken. Zeichnung, Lithographie, Holzschnitt, Kupferstich und Radierung, sowie die verwandten graphischen Verfahren des Hoch-, Flach- und Tiefdruckes / hrsg. von Walter Ziegler. - Halle an der Saale : Knapp.
§ Title means: The manual graphic techniques. Drawing, lithography, woodcut, engraving and etching, as well as the related graphic manners of relief, planographic and intaglio printing
– Vol. 1: Die Schwarz-Weißkunst. - Erweiterte zweite Aufl. - 1912. - XI, [1], 323 p. : 120, [2] Fig., [5] vign. ; 23.5–24.5 cm.
Contents: p. VII.
MIP: pp. 126–302, 311–321 : Fig. [1]–[2], 44–120, [5] vign.
Stocklist: inside front cover, inside and outside of back cover.
§ Title means: The art of black and white
The *Figuren* are diagrams, photographs and reproductions.
Intended audience, p. 6: 'Künstler' and 'Kunstliebhaber'.
1 –
Aquatint / Crayon Engraving / Drypoint / Electrolytic Etching / Lift-ground / Line Engraving / Line Etching / Mezzotint / Photomechanical Etching / Soft-ground / Stipple Engraving
2 –
Copper / Gelatin / Iron / Lead / Plastic / Steel / Zinc
3 –
Casting / Counterproof / Ink / Paper / Press / Printing in Black / Printing Monochrome
4 –
Lithography / Monotype / Woodcut / Wood Engraving
5 –
Original and Reproduction
In: ABK; CCB; DBI-VK; DNB-L; KVB; NCC; NSUG; NUC–1956; Priv.Coll.; RMA; SBB; UBA (2×); UBAB; UBG; UBL-KHI; UBLz.

<div align="right">367.3</div>

Die manuellen graphischen Techniken. Zeichnung, Lithographie, Holzschnitt, Kupferstich und Radierung, sowie die verwandten graphischen Verfahren des Hoch-, Flach- und Tiefdruckes / hrsg. von Walter Ziegler. - Halle an der Saale : Knapp.
– Vol. 1: Die Schwarz-Weißkunst. - Dritte Aufl. - 1919. - XI, 326 p. : 120, [2] Fig., [5] vign. ; 23.5–24.5 cm.
Contents: p. VII.
MIP: pp. 127–305, 314–324 : Fig. 44–120, [5] vign.
§ Only slightly revised, p. V.
The new preface is dated, p. V: 'Ach a Salzach (Oberösterreich), im März 1919'.
In: ABK; CCB; DNB-L; GBR; MBvB; NUC–1956.

<div align="right">367.4</div>

Die manuellen graphischen Techniken. Zeichnung, Lithographie, Holzschnitt, Kupferstich und Radierung, sowie die verwandten graphischen Verfahren des Hoch-, Flach- und Tiefdruckes / hrsg. von Walter Ziegler. - Halle an der Saale : Knapp.
– Vol. 1: Die Schwarz-Weißkunst. - Vierte Aufl. - 1923. - XII, 331, [1] p. : 125 Abb. ; 23.5–24.5 cm.
Contents: p. VII.
MIP: pp. 130–230, 319–327 : Abb. 21, 31–45, 47–109, [5] vign.
Stocklist: p. [1].
§ Only slightly revised, p. VI.
The preface is dated, p. VI: 'Ach a. Salzach, Mai 1922'.
In: DNB-L; CCB; DBSM; KVB; NUC–1956; Priv.Coll.; TUD; UBAB.

<div align="right">367.5</div>

Die manuellen graphischen Techniken / hrsg. von Walter Ziegler. - Halle an der Saale : Knapp.
§ Title means: Manual printmaking techniques
– Vol. 2: Die manuelle Farbengraphik. - [1st ed.]. - 1917. - VIII, 152 p. : 9, [1] Fig., [1] diagram ; 23.5 cm.
Stocklists: inside front cover, inside and outside back cover.
Contents: p. VII.
Literature: p. 130.
§ Title means: Manual of colour printing
The preface is dated, p. V: 'München, 1915'.
The *Figure* are diagrams.
1 –
Line Etching / Soft-ground
3 –
Hand-colouring / Ink / Multiple-plate Printing / Paper / Printing à la Poupée / Printing Monochrome / Printing Polychrome
4 –
Lithography / Monotype / Nature Printing / Screen Printing / Woodcut
5 –
Aesthetics / Art Dealing
In: ABK; CCB; DBI-VK; DNB-L; KVB; MBvB; NCC; RMA; UBA (2×); UBAB; UBG; UBLz.

<div align="right">367.6</div>

Die manuellen graphischen Techniken. Zeichnung, Lithographie, Holzschnitt, Kupferstich und Radierung, sowie die verwandten graphischen

Verfahren des Hoch-, Flach- und Tiefdruckes / hrsg. von Walter Ziegler. - Halle an der Saale : Knapp
– Vol. 2: II. Band: Die manuelle Farbengraphik. - Zweite Aufl. - 1922. - VIII, 171, [5] p. : 10, [1] Abb., 2 Tafel ; 23.5–24.5 cm.
Contents: p. VII.
Literature: p. 128.
Stocklist: p. [5].
With literature.
§ Containing the 1915 preface and a new preface for this edition.
This is the second edition of the second part, but including the 1901 edition this is the third edition.
The *Figure* and *Tafel* are diagrams.
The references to the first volume (p. 171) are adapted to the paging in the 1919 edition.
In: CCB; DNB-L; DBSM; KVB; NUC–1956; Priv.Coll.; TUD; UBAB.

Zonca (Vittorio) 368.1

Novo teatro di machine et edificii per varie et sicure operationi con le loro figure tagliate in rame é la dichiaratione, e dimonstratione di ciascuna. Opera necesaria ad architetti, et a quelli, che di tale studio si dilettano / di Vittorio Zonca ; [preface by Pietro Bertelli]. - Padoua : apresso Pietro Bertelli, 1607. - [8], 115 p. : [42] tav., engr. titlep. ; 29.5–30.5 cm.
Contents: p. [5].
MIP: pp. 76–78 ; fig. [26].
§ Title means: New theatre of machines and constructions for different and secure operations. With their design engraved in copper and the description and demonstration of every one. Works necessary for architects, and for those, which are dilettante in this study
Basically a reference work on engineering, but included in the present bibliography because of the details concerning the construction of the roller press and intaglio printing.
Zonca died in 1602 and his text was published posthumously.
The preface is dated, p. [4]: 'Di Padoua alli 7. Febraro 1607'.
P. 90 is numbered '80'.
All *tavole* are engravings. In between pp. 88 and 89 are two leaves printed on three sides with three engravings (pl. 30–32). All *tavole* except the first are printed with letterpress text on the other side (recto or verso).
Photomechanical reprints: Roma 1969 [No. 368.13]; Milano 1985 [No. 368.14].
1 –
Line Engraving / Line Etching
2 –
Copper
3 –
Ink / Paper / Press / Printing in Black
In: BL; BLBS; BN; BS; CCB; DBI-VK; HAB; KB; *Levis 1912*: 524, 525; NCC; NUC–1956 (8×); OCLC.

368.2

Novo teatro di machine et edificii per varie et sicure operationi : co'le loro figure tagliate in rame é la dichiaratione, e demostratione di ciascuna. Opera necesaria ad architetti, e a quelli, che di tale studiosi dilettano / di Vittorio Zonca. - Padoua : appresio F[rancesco] Bertelli, 1621. - [8], 115, [1] p : ill. ; 2º.
NOT SEEN
In: BL; BLBS; BN (2×); BNM; BS; DBI-VK; NUC–1956 (4×); OCLC; ULC.

368.3

Novo teatro di machine et edificii ... [etc.?] / di Vittorio Zonca. - Padua : appresso Francisco Bertelli, 1627.
NOT SEEN
In: NUC–1956; TUD.

368.4

Novo teatro di machine et edificii ... [etc.?] / di Vittorio Zonca. - Padua : appresso Francisco Bertelli, 1647.
NOT SEEN
In: DBI-VK.

368.5

Novo teatro di machine et edificii per varie et sicure operationi : co'le loro figure tagliate in rame é la dichiaratione e demostratione di ciascuna. Opera necesaria ad architetti, et a quelli, che di tale studiosi dilettano / di Vittorio Zonca. - Padoua : appresso Francisco Bertelli, 1656. - [8], 115 p. : titlepl., [42] engr. ; 30 cm.
List of engravings: p. [5].
MIP: pp. 76–78 : fig. [26].
§ The preface is dated, p. [4]: 'Di Padoua li 29. Settembre 1656'.
The engravings are printed from the same plates, but the plates are partly scraped. The title plate is partly scraped, partly re-engraved and some new lines are added. The text of the *impressum* is adapted.
In: BL; BLBS; BS; CCB; DBI-VK; HAB; NSUG; NUC–1956 (11×); OCLC; UBA; UBL; UBU; ULC.

368.6

Yüan hsi ch[ay]i ch[ay]i t[ay]u shuo lu tsui chüan ti san / [Johannes Terentius = Johann Schreck] Teng-yü-han k[ay]ou shou ; Wang Cheng [Zheng] i hui. Hsin chih chu ch[ay]i t[ay]u shuo. - [Bejing] : An-k[ay]ang Chang P[ay]eng-fen, 1627.
§ Title means: Diagrams and explanations of the wonderful machines of the Far West
Also transcribed as: Yuanxi qiqi tushuo luzui.
Contains translations of: Agostino Ramelli, *Diverse et artificiose machine*; Jacques Besson, *Instrumentorum et machinarum*; Vittorio Zonca, *Novo teatro di machine et edificii*. Furthermore the texts: *Xin zhi zhu qi tu shuo* and *Zhu qi tu shuo*. The plates depicting European machines are reproduced after illustrations in the European texts. Unclear whether the chapter on the roller press was translated and the image of the roller press reproduced; *Needham & Wang 1977*: 211–222; OCLC.
OCLC: 'chiefly ill.'
NOT SEEN:

In: OCLC.

Qi qi tu shuo : san juan / Deng Yuhan kou shu ; Wang Zheng yi hui. Xin zhi zhu qi tu shuo / Wang Zheng zhu. - [Bejing?] : Lai lu tang, Daoguang geng yin [1830]. - 4 vol. : ill. ; 25–28 cm.
§ Probably a reprint of: Bejing 1627 [No. 368.6].
NOT SEEN:
In: ULC.

Theatri machinarum / durch Henricum Zeisingk. - Leipzigk : In Verlegung Hennig Grossen des iungern, 1607–1610. - [1st ed.]. - 2 vol. : ill. ; 16.5–17 × 19 cm.
§ Title means: Theatre of machines
This edition without information on the roller press.
Photomechanical reprint: Berlin 1987 [No. 368.15].
– Vol. 1: Theatri machinarum Erster Theill. In welchem vilerley künstliche Machinae in unterschidlichen Kupfferstücken zu sehen sindt durch welche ieglicher schwerer last mit vortheil kan bewegt erhoben gezogen und gefuret werden. Beneben eigentlicher erklerung einer ieden kupfferplatten in sonderheit. Auch mit vorgehenden grundlichen bericht von wag und gewicht. Und zum beschluß wie eine künstliche bewegung zu machen darinnen des gantzen Himmelslauff fürzustellen / Allen denen so sich mechanischer Kunste furnehmlich bauens befleissen zum besten in Druck zusammen geordnett. Durch Henricum Zeisingk ; H.Z. f. [Heinrich Zeising]. - 1607. - [71], 165, [1] p. : etched titlep., XXV Fig.
Instructions to the bookbinder, list of figures: p. [15].
§ The preface is dated, p. [8]: 'Geben Leipzig den 13 Aprilis Anno 1607'. The colophon is dated, p. [1] at the back: 'Gedruckt zu Altenburg in Meissen durch Johann Meuschken im M.DC.VII. Jahr.'
– Vol. 2: Theatri machinarum Ander Theil. In welchem vielerley künstliche Wasserkunste die Wasser durch Reder pumpen Truck unnd Sprutzwerck zuerheben zusehen Mit vorhergehenden bericht der großen Und kleinen Wasserwagen beneben eigentlicher erklerung der Kupferblatten Und entlich zum beschlus etzlieche schöne feuer Sprutzenn um feuers gefahr sehr dinstlich zu gebrauchen. - 1610. - [8], 74, [4] p. : etched titlrp., 25 Fig.
Addenda & corrigenda: p. [1] at the back.
Instructions to the bookbinder, list of figures: p. [2].
§ The preface is dated, p. [8]: 'Datum Leipzig Am 16. Augusti Anno 1610'. The colophon is dated, p. [4] at the back: 'Gedruckt zu Altenburg in Meissen, in vorlegung Henning Grossen des Jüngern Buchh. Im MDCX. Jahr.'
In: BS; CCB; DBI-VK; HAB; NSUG (vol. 2); OCLC; UBL.

Theatrum machinarum / durch Henricum Zeisingk. - [2nd ed.] - Leipzick : Henning Grössen der Jüngern, 1612–1614. - 6 vol. : ill. ; oblong 4º
– Vol. 1: NOT SEEN.
– Vol. 2: NOT SEEN.
– Vol. 3: Theatri machinarum Dritter Theill. Darinnen vielerley künstliche Mühlwerck, von mancherley arten, wie die Namen haben mögen, nicht allein zu Menschlicher unterhaltung, Sondern auch su vielen andern sachen, Künsten und Handwercken sehr nützlichen, und zu wissen hoch von nöhten. Sampt der Mühlordnung, wie dieselbe in Chur und Fürstenthumb Sachssen, in den Mühlen, an der Sahla, Lüpen, Elster und Pleissenstrom gelegen, gehalten wird / [Heinrich Zeising]. - Leipzick : In Verlegung Henning Grossen des Jüngern, 1612. - [8], 91, [3] p. : 26 Nos.
Instructions to the bookbinder, list of figures: p. [1] at the back.
Addenda & corrigenda: p. [2] at the back.
§ The preface is dated, p. [7]: 'Datum Leipzig am 27. Februarii, Anno 1612'. The colophon is dated, p. [3] at the back: 'Gedruckt zu Altenburg in Meissen, in verlegung Henning Grossen des Jüngern Buch., Im Jahr M.DC.XII.'
– Vol. 4: Theatrum machinarum Vierdter Theil. Darinen allerhand schöne Machinae, als Schrauben, Druck, Drähe, Preß- und Hebwercgk zubefinden. Insonderheit von dem wunderbarlichen Trispasto, genant, Schrauben on Ende tractirt wird. Sampt iren zugehörigen Visirungen / merertheils aus Italian. und franzoß. Sprach mit fleiß transferirt, durch Hieronymum Megiserum. - Leipzig : Hennig Grossen der Jüngern, 1613. - [16], 85, [2] p. : 24 Nos.
MIP: pp. 17–20 : Nº 6.
Instructions to the bookbinder, list of figures: p. [1] at the back.
§ The preface is dated, p. [7]: 'Geben Leizpig den 25. Martij, Anno 1613'. The colophon is dated, p. [2] at the back: 'Gedruckt zu Altenburg in Meissen, In verlegung Henning Grossen des Jüngern, Buchh. zu Leipzig. Im Jahr, M DC XIII.'
Perhaps published in 1621.
The text about the construction of the roller press and intaglio printing is a translation of the edition: Padoua 1607: p. 76–78. The etching 'Nº 6' accompanying it is based on the engraving in this edition. Other texts and plates are also after Zonca.
3 –
Printing in Black / Ink / Press
– Vol. 5: Theatri machinarum Fünffter Theill. Im welchem Allerhand lustige und schöne Machinae von Spring und Schöpffbrünen zierlichen fontanen, von seltzamen Inventionen als Schlangen röhren Vögelgesang Pfeiffenwergk und dergleichen anzürichten. Auch zum beschlüs etliche Frücht mitt Spring wergk zubefinden, Sampt iheren zugeherigen Visirüngen / mehrentheils aus frömden Sprachen mit Fleiß transferirt, durch Hironijmum Megiserum ; [etch. by] A[ndreas] B[retschneiter]. - [Leipzig] : Henning Grössen der Jüngern, 1614. - [12], 102, [2] p. : 24 Nos.
Addenda & corrigenda: p. [1] at the back.
Instructions to the bookbinder, list of figures: p. [1] at the back.
§ The preface is dated, p. [12]: 'Datum Leiptzig, den 2. Septembr: Anno 1613'. The colophon is dated, p. [2] at the back: 'Gedruckt zu Altenburg in Meissen, durch Johann Meuschken, In vorlegung Henning Grossen des Jüngern, Buchhändlers zu Leipzig. Im Jahr, M DC XIIII.'
– Vol. 6: NOT SEEN.
In: BL; BLBS; BN; BS; DBI-VK; HAB (vol. 3–5); NCC; NSUG (vol. 3); OCLC.

Theatrum machinarum / durch Henricum Zeisingk. - Zum 3. Mahl in Druck geordnet. - Leipzig : Gross, 1618–1651. - 6 vol. : ill. ; 16.5 cm.
§ This edition has a complex bibliography and is probably a new gathering of older imprints. Every volume has two or three datings. The dates in the colophon are the most recent and are given here as the year of publication.
Vol. 1: 1621; '1651' corrected to '1661', at the back '1658'.
Vol. 2: [s.a.], 'Zum 3. mal gedruckt', colophon at the back '1627'; '1614' corrected to '1640'.

Vol. 3: '1618' on title page, colophon at the back '1629'; '1618', at the back '1629'.
Vol. 4: 1613 on title page.
Vol. 5: 1614 on title page.
Vol. 6: '1614' and '1636' on title page, colophon at the back '1655'.
All title plates are etchings, some with letterpress text. All illustrations are etchings and are printed on separate sheets inserted in the text.
– Vol. 1: Theatri machinarum Erster Theill. In welchem vilerley künstliche Machinae in –unterschidlichen Kupfferstücken zu sehen sindt, durch welche ieglicher schwerer last mit vortheil kan bewegt erhoben gezogen und gefüret werden. Beneben eigentlicher erklerung einer ieden kupfferplatten in sonderheit. Auch mit vorgehenden grundlichem bericht von wag und gewicht. Und zum beschlusz wie eine künstliche bewegung zu machen darinnen des gantzen Himmelslauff fürzustellenn / Allen denen so sich mechanischer Kunste furnehmlich bauens befleissen zum besten in Druck zusammen geordnett. Durch Henricum Zeisingk ; HZ f. [Heinrich Zeising?]. - Leipzick : Henning Grossen des iüngern, 1621. - [68], 159, [1] p. : XXV Nos.
Instructions to the bookbinder, list of figures: p. [12] at the beginning.
§ The colophon is dated, p. [1] at the back: 'Leipzig / In Verlegung Hennig Grossen des Jüngern Buchhändlers. Gedruckt bey Georg Liegern / im Jahr / M.DC.XXI.'
– Vol. 2: Theatri machinarum Ander Theil. In welchem Vielerley schöne Wasserkünste, die Wasser durch Räder, Pumpen, Truck und Sprützwerck zu erheben, zusehen, Mit vorhergehendem bericht, der grossen und kleinen Wasserwagen, Beneben erklerung der Kupferplatten, Und endlichen zum beschluß etliche künstliche WasserSprützen in Fewers gefahr sehr dienstlichen zugebrauchen / mehrentheils dur Heinrich Zeising visirt. - Zum dritten mahl in Druck geordnet. - [Leipzig] : Hennig Grossen des Jüngern, [s.a.]. - [8], 76, [3] p. : 25 Nos.
Instructions to the bookbinder, list of figures: p. [1] at the back.
§ The preface is dated, p. [8]: 'Datum Leipzig, den 1. Septemb. Anno 1613'. The colophon is dated, p. [3] at the back: 'Zum drittenmal gedruckt zu Leipzig, In verlegung Henning Grossen des Jüngern Buchh. S. Erben. Im Jahr, M.DC.XXVII.'
– Vol. 3: Theatri machinarum Dritter Theil. Darinnen vielerley künstliche Mühlwerck, von mancherley arten, wie die Namen haben mögen, nicht allein zu Menschlicher Unterhaltung, Sondern auch su vielen andern sachen, Künsten und Handwercken sehr nützlichen, und zu wissen hoch von nöhten. Sampt der Mühlordnung, wie dieselbe in Chur und Fürstenthumb Sachsen, in den Mühlen, an der Sahla, Lüpen, Elster und Pleissenstrom gelegen, gehalten wird / [Heinrich Zeising]. - Leipzick : In Verlegung Henning Grossen des Jüngern, 1618. - [8], 91, [2] p. : 26 Nos.
Instructions to the bookbinder, list of figures: p. [1] at the back.
§ The preface is dated, p. [7]: 'Datum Leipzig am 27. Februarii, Anno 1612'. The colophon is dated, p. [2] at the back: 'Leipzig / In Verlegung Henning Grossen des Jüngern S. Erben. Gedruckt durch Justum Jansonium, VVardensem Cimbro-Danum, Im Jahr M.DC.XXIX.'
– Vol. 4: Theatri machinarum Vierdter Theil. Darinnen allerhand schöne Machinae, als Schrauben, Druck, Drehe, Press und Hebwerck zubefinden: Insonderheit von dem wunderbarlichen Trispasto, genant, Schrauben ohn Ende trastirt wird: Sampt ihren zugehörigen Visirungen / mehrenteils aus Italien. und Französischer Sprache mit Fleis transferirt durch Hieronymum Megiserum ; [etch. by] A[ndreas] B[retschneiter]. - Leipzig : Hennig Grossen der Jüngere, 1613. - [12], 85, [1] p. : 28 Nos.
MIP: pp. 17–20 : № 6.
Instructions to the bookbinder, list of figures: p. [1] at the back.
§ The preface is dated, p. [7]: 'Geben Leipzig den 25. Martii, Anno 1613'.
– Vol. 5: Theatri machinarum Fünffter Theill. Im welchem Allerhand lustige und schöne Machinae von Spring und Schöpffbrünen zierlichen fontanen, von seltzamen Inventionen als Schlangen röhren Vögelgesang Pfeiffenwergk und dergleichen anzürichten. Auch zum beschlüs etliche Frücht mitt Spring wergk zubefinden, Sampt iheren zugeherigen Visirüngen / mehrentheils aus frömden Sprachen mit Fleiß transferirt, duch Hironijmum Megiserum ; [etch. by] A[ndreas] B[retschneiter]. - [Leipzig] : Henning Grössen der Jüngern, 1614. - [8], 102, [1] p. : 24 Nos.
Instructions to the bookbinder, list of figures: p. [1] at the back.
§ The preface is dated, p. [7]: 'Datum Leiptzig, den 29. Marij, Anno 1614'.
– Vol. 6: Theatri machinarum. Sechster und Letzer Theill. Darinen allerhand Lustig und schöne Machinae. Als noch etliche Künste das Wasser damit zuheben, Morast auszudrucken, die Erde aus Gräben zufordern, Pfael und fundament in Meer und Flüssen einzuschlagen Brücken uber Ströme und Gräben zubawen. Auch andre Künstliche wercke mehr Als new erfundene Buch und Spiegel [B?]üte Bratender und andern Instrumenten / mehrentheils aus frombten Sprachen transferirt durch Hieronijmum Megiserum ; [etch. by] A[ndreas] B[retschneiter]. - [Leipzig] : Henning Grossen der Jüngere, 1614, 1636. - [2], 83, [1] p. : 20 Nos.
§ The name of the engraver 'Andreas Bretschneiter' is on the title plate on the pedestal in the lower right corner.
The title plate is dated: the date '1614' is on two the pedestals to the left ['16'] and the right ['14'], '1636' is underneath the title. The colophon is dated: 'Leipzig, In Verlegung Henning Grossens Sel. Erben, Druckts in Fried. Lanck. Druckereij Christophorus Cellarius, Anno M.CD.LV.'
In: CCB; DBI-VK; HAB.

368.11

Heinrich Zeisings Theatrum Machinarum : so in sechs Theil bestehen ... So in Sechs Theil bestehend: Jn welchen gehandelt wird; von vielerley Künstlichen Machinis, eine schwere Last mit Vortheil zu bewegen. ... [etc.] / mehrentheils auß frembden Sprachen versetzt durch Hieronymum Megeserium. - Anjetzo Auffs newe allen Liebhabern dieser Künste zum Truck befördert. - Leipzig : in Verlegung Friedrich Lanckischens Erben, 1673. - 6 vol. in 1 bd. : ill. ; […] cm.
§ Collation according to the Gottfried Wilhelm Leibniz Bibliothek, Hannover: '[33] Bl., 158 S., [1], [4] Bl., 77, [1] S., [1], [4] Bl., 91, [1] S., [8] Bl., 86 S., [5] Bl., 102 S., [1], [1] Bl., 83, [1] S., [19] gef. Bl., [129] Bl. : 25, 25, 26, 28, 24, 20 Ill. (Kupferst.)'.
NOT SEEN
In: KVK; OCLC.

368.12

Heinrich Zeisings Theatrum machinarum, so in sechs Theil bestehend / mehrenteils aus frembden Sprachen versetzt durch Hieronymum Megiserum. - Anitzo auffs neue wegen vielfältig geschehener Nachfrage, allen Liebhabern dieser Künste zum Druck befördert. - Leipzig : in Verlegung Friedrich Lanckischens Erben, 1708. - 6 vol. : ill. ; 16.5 × 20 cm.
§ BS, DBI-VK: 'Leipzig, 1705'.
– Vol. 4: Theatri Machinarum vierdter Theil. Darinnnen allerhand schöne machinae als Schrauben, Druck, Drehe Preß u[nd] Hebwerck zu befinden. Insonderheit von dem wunderbarlichen Trispasto, genant, Schrauben ohn Ende tractirt wird. Sampt ihren zugehörigen Visirungen / mehrteils aus Italiän[ischer] und Frantzösischer Sprache mit Fleiß transferirt, durch Hieronymum Megiserum. - [16], 83 p. : 28 pl., partly folded.
MIP: pp. 17–20 : Fig. 6.
In: BL; BLBS; BS; KVK; HAB; NSUG; OCLC.

Novo teatro di machine et edificii per varie et sicure operationi. Con le loro figure tagliate in rame é la dichiaratione, e demonstratione di ciascuna. Opera necesaria ad architetti, et a quelli, che di tale studio si dilettano / di Vittorio Zonca. - Ed. anastatica / a cura di Karl Weiss. - [Roma] : Aedes Acutensu, [1969]. - 115 p. : ill. pl. ; 34 cm.
§ Photomechanical reprint of: Padoua 1607 [No. 368.1].
NOT SEEN
In: OCLC.

Novo teatro di machine et edificii, 1607 / Vittorio Zonca ; a cura di Carlo Poni. - [Photom. repr.]. - Milano : Polifilo, 1985. - LVIII, [10], 115, [2] p. : [6], [49] ill., II tab. ; 31 cm. - (Libri Rari, collezione di ristampe con nuovi apparati ; VII).
Literature: p. XLIII.
English summary: p. LV.
Contents: p. [7].
Edition: 2,000 copies.
ISBN 88-7050-407-7 (hardcover)
§ The preface is dated, p. [VIII]: 'Badia Fiesolana (Fiesole), 15 febbraio 1985'. The colophon is dated, p. [2] at the back: 'Cremono 1985'.
Photomechanical reprint of: Padoua 1607 [No. 368.1].
Review: *Technology and Culture*, 29 (1988) 2: 285.
In: BS; DBI-VK; HAB; OCLC; UBH.

Theatri machinarum / Heinrich Zeising. - [Photom. repr.]. - Berlin : Verlag Technik, 1987. - 278 p. : 76 ill. ; 11 × 14 cm. - (Technik–Mini–Reprint).
ISBN 3-341-00332-6 (in cassette)
§ Photomechanical reprint of: Leipzig 1607–1610 [No. 368.8].
NOT SEEN
In: DNB-F; DNB-L; NSUG; OCLC; SBB.

Nickelzinkradierung / Bruno Zwiener ; hrsg. L.M.K. Capeller. - 1. Aufl. - Mühldorf (Oberbayern) : Geiger, [1928]. - 18, [2] p. : 19 Abb. ; 31.5 cm. - (Kunst und Schule, Kunstbücherei für Schule und Haus ; 11).
Advertisement: inside front cover, p. 2, inside and outside backcover.
Stocklist: p. [1].
Titles in the series: p. [2].
§ The *Abbildungen* are photographs and reproductions.
1 –
Drypoint
2 –
Zinc
3 –
Press / Printing in Black
5 –
Health and Safety
In: DNB-L.

Linolradierung / Os[kar] Zwiener ; Umschlagzeichnung von L.M.K. Capeller. - 1. Aufl. - München : Natur & Kultur, [1920]. - [24] p. : 16 Abb. ; 22.5 cm. - (Technische Jugend-Bücherei ; 10).
Advertisement: p. [24].
List of titles in the series: inside backcover.
§ The *Abbildungen* are diagrams, one photograph and reproductions. P. [20]: 'die abgebildeten Linoleumradierungen ... sind alle von jungen geschickten Händern gearbeitet worden'.
This series of schoolbooks is related to the monthly magazine *Natur und Kultur*.
Intended audience: young students and youth clubs.
1 –
Drypoint
2 –
Linoleum
3 –
Printing in Black / Printing Monochrome / Rubbing
In: DNB-L.

Articles

References to primary sources are in bold type with the date only between brackets: **Jacque** (1852).

Reference commonly is to the first issue described under a heading: **Longhi** (1793). If reference is to a specific issue, then the year of this issue is given: **Longhi** (1800).

If more publications by the same author are described in this list, then they are discerned by a serial number. When

referred to, their mutual years of publication are given: **Le Prince 1** (1769), **Le Prince 2** (1771).

A

About protecting steel plates 371

[About the protection of steel engraving plates].
In: Journal of the Royal Institution. - [1821–1822?].
2 –
Steel
NOT SEEN
In: **Notice** (1822).

Aetzgrund für Kupferstecher 372

Aetzgrund für Kupferstecher.
In: Dingler's polytechnisches journal. - Vol. 87 (1843), no. 5. - P. 394.
§ Title means: Etching ground for engravers
Title description after photocopy.
1 –
Line Etching
In: TUD.

Afdruk maaken 373

Hoe men van konstplaaten of geschriften eenen afdruk kan maaken, zonder die te beschadigen.
In: Oeconomische courant. - Vol. 1 (1799), no. 13 (20 March), p. 100.
§ Title means: How to make an impression of printed images or printed texts without damaging them
The same recipe in: **Liebhaber** 2 (Nürnberg 1703), p. 338.
4 –
Anastatic Proof / Printing in Black
In: KB.

Aqua-tint plates 374

Aqua-tint plates / ed. P.T. & L.
In: The printing times and Lithographer. - New series, vol. 3 (1877), (15 Sep.). - P. 201–202.
§ Answer to the question of A Young Engraver 'How to make an aqua-tint plate [etc.]'. The editor's answer is based on **Fielding** (London 1841), pp. 39–56.
1 –
Aquatint
In: UBL.

Art of stipple engraving 375

The art of stipple engraving.
In: Paper & printing trades journal. - (1889), no. 68. - P. 16–17.
1 –
Stipple Engraving
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B. 35.

Austin (George Lowell) 376

With acid and needle [pt. 1] / George Lowell Austin.
In: Galaxy. - Vol. 18 (1874). - 2 pts.
§ The full name of the magazine is perhaps: The galaxy miscellany and advertiser.
This is the first printed publication on the technique of etching in the USA.
Pt. 1: vol. 18 (1874), (Nov.). - P. 639–646.
Pt. 2: vol. 18 (1874), (Dec.). - P. 768–777.
1 –
Line Etching
NOT SEEN
In: *Barnhill 2006*: no. 1125.

B

Bader (L.W.)
See: **Semenoff** (Nik) & **Bader** (L.W.) [No. 579].

Barabé (Pierre-André) 377.1

L'art de graver l'architecture dans le goût du lavis.
In: Mercure de France. - (1763), (April), 2nd vol. - P. 143–146. - (Gravure).
§ Title means: Tonal engraving for architecture
Title description after photocopy.
1 –
Aquatint / Crayon Engraving
In: *Deville 1973*: 103 (Gravure).

377.2

L'art de graver l'architecture dans le goût du lavis.
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 74 (Jan/June 1763; 1970). - P. 314–315.
In: KB.

Barff (Frederick F.; 1876) 378

A new etching process / Frederick F. Barff.
In: The printing times and Lithographer. - New series, vol. 2 (1876), (15 Feb.). - P. 42.
Suppliers p. 42.
1 –
Line Etching
2 –
Copper
In: UBL.

Barff (Frederick F.; 1884) 379

[Question on acid] / Clapham Etcher.
In: The printing times and Lithographer. - New series, vol. 10 (1884), (15 Aug.). - P. 186. - (Answers to correspondents).
1 –
Line Etching
2 –
Copper
In: UBL.

Baudin (…) 380

[Note on a transfer technique] / […] Baudin.
In: Allgemeine Annalen der Gewerbstunden. - Leipzig ; Wien : […], 1803. - Vol. 2, p. 288.
1 –
Line Etching
NOT SEEN
In: *Tiemann 1806*: 500.

Behr (Marion) & **Behr 1** (Omri) 381

Ecologically safe etching / Marion Behr, Omri Behr.
In: ChemTech. - Vol. 21 (1991), no. 4. - P. 210.
1 –
Electrolytic Etching
NOT SEEN

Behr (Marion) & **Behr 2** (Omri) 382

Etching and tone creation using low-voltage anodic electrolysis / Marion Behr, Omri Behr.
In: Leonardo. - Vol. 26 (1993), no. 1. - P. 51–55 : ill.
1 –
Electrolytic Etching
In: KB.

Behr (Marion) & **Behr 3** (Omri) 383

Electroetch / Marion Behr reports on a safe etching system.
In: Printmaking today. - Vol. 3 (1994), no. 1 (spring). - P. 18–19 : [3] ill.
1 –
Electrolytic Etching
In: Priv.Coll.

Behr (Marion) & **Behr 4** (Omri) 384

Electroetch II. Safe solutions from start to finish : etching to steel facing / Marion Behr reports on developments.
In: Printmaking today. - Vol. 4 (1994), no. 4 (winter). - P. 24–25 : [2] ill.
1 –
Electrolytic Etching

In: Priv.Coll.

Behr 5 (Marion)   385

Intaglio without tears / a reply from Marion Behr.
In: Printmaking today. - Vol. 7 (1998), no. 3 (autumn). - P. 31.
§ Reaction to **Green 1** (1998) [No. 463].
1 –
Electrolytic Etching
In: Priv.Coll.

Behr (Marion) & **Behr 6** (Omri)   386

Setting the record straight / Marion and Omri Behr defend the Electroetch method.
In: Printmaking today. - Vol. 7 (1998), no. 4 (winter). - P. 31–32 : [1] ill.
§ Reaction to: **Green 2** (1998) [No. 464].
1 –
Electrolytic Etching
In: Priv.Coll.

Berres (Josef)   387

Ueber das Aezen und Abdruken von Daguerre's Lichtbildern / Jos[ef] Berres.
In: Polytechnisches Journal. - Vol. 21 (1840), no. 77. - P. 316–318.
§ Title means: On the etching and printing of daguerreotypes
See also: **Donné** (1840) [No. 428].
1 –
Photomechanical Etching
2 –
Copper / Silver / Steelfacing
4 –
Photography
In: UBA.

Bird (John) 388.1

[Patent on a black earth pigment for intaglio printing ink] / John Bird.
In: Repertory of patent inventions (1836) (June). - P. 363.
§ English patent: A.D. 1835, October 15.–No. 6906.
3 –
Ink
NOT SEEN
In: *Woodcroft 1969*, Supplement: 315–316.

388.2

Bird's verbesserte Drukerschwärze und Anstreichfarbe.
In: Polytechnisches Journal. - Vol. 17 (1836), no. 61. - P. 157.
In: UBA.

Böhme (Rud.)
See: **Schwarz** (H.) & **Böhme** (Rud.) [No. 576].

Böttger 1 (Rud.)   389.1

[Chemically offsetting engravings] / [Rud.] Böttger.
In: Bayerische Kunst und Gewerbe. - (1861), (Jan.).
NOT SEEN
In: *Tijdschrift* [No. 389.2].

389.2

Nieuwe wijze om staal- en kopergravures op scheikundigen weg aftedrukken / [Rud.] Böttger.
In: Tijdschrift uitgegeven door de Nederlandsche Maatschappij ter Bevordering van Nijverheid. - Vol. 26 (1863). - P. 6–7.
3 –
Anastatic Proof / Paper / Printing in Black
In: KB.

Böttger 2 (Rud.)   390

Coating engraved copper-plates with steel / [Rud.] Böttger.
In: The printing times and Lithographer. - New series, vol. 3 (1877), (15 Aug.). - P. 173.
2 –
Copper / Steelfacing
In: UBL.

Böttger (Rud.) & **Bromeis 1** (C.)   391.1

Ueber die Kunst Glass zu ätzen und zu drucken / m.
In: Journal für Buchdruckerkunst. - Vol. 11 (1844), no. 4. - Col. 59–60 : [7] etch.

§ Title means: About the art of etching and printing glass
Mentions 'Dr. Bromeis zu Hanau' and 'Professor Dr. Böttcher dahier' (= in Frankfurt).
The etchings are specimens of impressions from glass plates, prepared with various processes and printed on different papers.
1 –
Line Etching
2 –
Glass / Porcelain
3 –
Printing in Black
5 –
Health and Safety
In: HAB; UBA.

391.2

Hyalografie / C. Bromeis, [Rud.] Boettger.
In: Journal für Buchdruckerkunst. - Vol. 11 (1844), no. 5. - [1] fol.
§ The text is an unpaged and unillustrated prospectus on their process for etching glass printing plates inserted in this issue of the journal.
The prospectus is dated: 'Hanau, den 18. März 1844. Dr. C. Bromeis. Frankfurt a/M, den 18. März 1844. Prof. Dr. Boettger'.
In: HAB; UBA; UBU.

391.3

Ueber die Kunst, Glas zu äzen und zu druken (Hyalographie) - ([1844?]).
In: Allgemeine polytechnische Zeitung und Handlungszeitung.
NOT SEEN
In: *Polytechnisches Journal*, see [No. 391.4].

391.4

Ueber die Kunst, Glas zu äzen und zu druken (Hyalographie).
In: Polytechnisches Journal. - Vol. 25 (1844), no. 92. - P. 237–238.
§ Copy of the article in: Allgemeine polytechnische Zeitung und Handlungszeitung.
In: UBA.

391.5

Glasdruk, Hyalographie / C. Bromeis, [Rud.] Boettger.
In: Polytechnisches Journal. - Vol. 25 (1844), no. 93. - P. 238–240.
§ Without reference.
The article is dated, p. 240: 'Hanau, den 18. März 1844. Dr C. Bromeis. Frankfurt a.M., den 18. März 1844. Prof. Dr. Boettger'.
In: UBA.

Böttger (Rud.) & **Bromeis 2** (C.)   392

Glasätzung (Hialografie) / [Rud.] Böttger, C. Bromeis.
In: Gutenberg : Zeitschrift für Buchdrucker, Schriftgießer, Zeichner, Holzschneider, Graveurs, Stein- und Kupferdrucker, Galvanografen, Stilografen, Chimitipisten, Fotografen, Galvanoplastiker, Buchbinder, Glasätzer etc. - Vol. 1 (1855), no. 4. - P. 28–29.
§ Title means: Glass etching (hyalography)
The recipe and etching process (p. 29, col. 1) is nearly identical to **Prestl** (1845) [No. 555].
1 –
Line Etching
2 –
Glass
3 –
Casting / Printing in Black
In: Priv.Coll.; UBA.

Bolas (Thomas)   393

Intaglio copper plates by the etching process / Thomas Bolas.
In: The year-book of photography and photographic news almanac. - (1888). - P. 171–175 : ill.
1 –
Line Etching / Photomechanical Etching
NOT SEEN
In: BCIN.

Boston films drypoint process   394

Boston films drypoint process.
In: Art News. - Vol. 28 (1929), (Dec.). - P. 4.
1 –
Drypoint
2 –
Plastic
NOT SEEN
In: *Art Index*, 1 (1929–1932): 464.

Bottomley (Sue Anne) 395

Silk aquatint: old hat or nouveau chapeau / Sue Anne Bottomley.
In: Printmaking today. - Vol. 6 (1997), no. 4. - P. 27–28 : [2] ill.

§ Correction by the editor: 'An apology', *Printmaking Today*, 7 (1998) 1: 32.
1 –
Collagraph
In: Priv.Coll.

<div align="right">**Boudier** (…) 396.1</div>

[Etching on glass] / [Boudier fils]
In: Moniteur [?]. - (l'An VII [1799?]). - P. 1297.
§ Boudier fils is mentioned in the session of the Académie des Sciences of 23 October 1799 (1 Brumaire An VIII): 'le citoyen Boudier fils présente un moyen de graver sur verre'; letter by Jacques Bocquentin of 19 December 1994.
An VII = 22 Sep. 1798–22 Sep. 1799.
NOT SEEN
In: *Hammann 1857*: 249.

<div align="right">396.2</div>

[Etching on glass] / […] Boudier.
In: Oeconomische Courant. - Vol. 2 (1800), no. 127. - P. 182. - (Eenige merkwaardigheden uit de jongste zittingen van 't Institut National te Parys).
1 –
Line Etching
2 –
Glass
In: KB.

<div align="right">**Bradbury 1** (Henry) 397</div>

On the security and manufacture of bank notes / Henry Bradbury.
In: Journal of the Society of Arts. - Vol. 4 (1856). - P. 638–641.
§ Based on a lecture at the Royal Institution of Great Britain of 9 May 1856.
The article is also published independently, illustrated with two specimens; *Bradbury 1856*.
1 –
Electrotype / Line Engraving
2 –
Steel / Steelfacing
4 –
Photography / Relief Printing
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B60; **Joubert 2** (1859, 22 July) [No. 495.8]: 601.

<div align="right">**Bradbury 2** (Henry) 398.1</div>

Electro copies of engraved steel plates / Henry Bradbury.
In: Journal of the Society of Arts. - Vol. 8 (1860), (4 May). - P. 444–445.
§ The letter is dated: '12 and 13, Fetter-lane, Fleet-street, May 2, 1860'.
Concerns nickelfacing copper plates. Also about nickelfacing steel plates in order to prepare them for making electrotypes, instead of using *gutta percha* moulds. The nickelfacing protects the steel plates in the copper sulphate bath used for making the electrotypes.
With reference to: **Joubert 2** (1859, 22 July & 29 July) [Nos. 495.8 and 495.10].
1 –
Electrotype
2 –
Steelfacing
In: *Bridson & Wakeman 1984*: no. B116; NSUG.

<div align="right">398.2</div>

Elektro-kopijen van gegraveerde staalplaten.
In: Laurens Coster. Tijdschrijft voor beoefenaren en voorstanders der boekdrukkunst. - Vol. 10 (1867). - P. 66–67.
§ Title means: Electro(type) copies of engraved steel plates
In: SBH; UBA; UBU.

<div align="right">**Bradley** (Dale C.) 399</div>

Toray silicone intaglio / Dale C. Bradley.
In: Printmaking today. - Vol. 5 (1996), no. 1 (spring). - P. 23 : [2] ill.
§ Concerns solarplate printmaking. The Toray plates discussed are also suitable for waterless lithography.
2 –
Plastic / Photopolymer Plate
4 –
Lithography
In: Priv.Coll.

<div align="right">**British copperplate** 400</div>

British copper plate.
In: Process photogram. - Vol. 6 (1899). - P. 33–35.
1 –
Copper

NOT SEEN
In: *Bridson & Wakeman 1984*: no. B129.

Bromeis (C.)
See: **Böttger** (Rud.) & **Bromeis** (C.; 1844) [No. 391].
See: **Böttger** (Rud.) & **Bromeis** (C.; 1855) [No. 392].

<div align="right">Brown 1 (Sue)   401</div>

Drypoint variations / Sue Brown.
In: Printmaking today. - Vol. 15 (2006), no. 4 (winter). - P. 20 : [4] ill.
1 –
Drypoint
2 –
Plastic
In: Priv.Coll.

<div align="right">Brown 2 (Sue)   402</div>

Creative connections / Sue Brown.
In: Printmaking today. - Vol. 17 (2008), no. 4 (winter). - P. 29 : [3] ill.
1 –
Photomechanical Etching
2 –
Aluminium
In: Priv.Coll.

<div align="right">Buonaccorsi (Giorgio von)   403</div>

Die Technik der Radierung / Giorgio von Buonaccorsi.
In: Die Druckkunst / redigiert von Johann Pabst. - Wien : Graphische Gesellschaft Österreichs, 1913. - P. 5–24.
Suppliers: pp. 7, 9–10, 20–21.
Literature: p. 23.
§ Title means: The technique of etching
Although descriptive the article is included in the present bibliography, because it contains much technical information.
Title description after photocopy.
1 –
Aquatint / Crayon Engraving / Drypoint / Lift-ground / Line Etching / Mezzotint / Soft-ground
2 –
Copper / Zinc
3 –
Casting / Multiple-plate Printing / Paper / Printing à la Poupée / Printing in Black / Printing Polychrome / Rubbing / Steelfacing
In: ÖNB; **Buonaccorsi** (Ravensburg 1916) [No. 054]: 139.

<div align="right">Burnet (John)   404</div>

Hints concerning etching. Adressed to amateurs / John Burnet.
In: The art-journal. - Vol. 11 (1849). - P. 5–6.
Suppliers: p. 6.
1 –
Drypoint / Line Etching
2 –
Copper
3 –
Press
5 –
Aesthetics
In: UBU.

Burón (Joaquín Gómez)
See: **Etstechnieken** [No. 096.4].

<div align="right">Bytautas 1 (Alfons)   405</div>

Safe as houses / Alfons Bytautas.
In: Printmaking today. - Vol. 13 (2004), no. 1 (spring). - P. 22–23.
§ Concerns solarplate printmaking.
2 –
Photopolymer Plate
3 –
Ink / Paper
In: Priv.Coll.

An ingenious mix / Alfons Bytautas.
In: Printmaking today. - Vol. 18 (2009), no. 3 (autumn). - P. 28–29.
Literature: p. 29.
§ A reaction to **Semenoff 2** (2009) [No. 578].
1 –
Line Etching
2 –
Aluminium / Copper / Zinc
5 –
Health and Safety
In: Priv.Coll.

C

[Mordant for etching steel printing plates] / [contributing letter by] Caelator.
In: London journal of arts and sciences. - Vol. 8 (1834). - P. 21–25. - (Original communications).
§ 'Caelator', Latin for 'engraver', is a pseudonym.
The letter is dated, p. 25: 'June, 1824'.
The journal was established in 1820.
Caelator comments Turrell's (p. 21) and Warren's (p. 22) etching fluids, see: **Turrell 2** (1824) [No. 605]; **Warren** (1823) [No. 615].
1 –
Line Etching
2 –
Steel
In: *Bridson & Wakeman 1984*: no. B96; UBA.

Carborundum mezzotint : new technique of Lewis C. Daniel.
In: Art News. - Vol. 45 (1947), (Jan.). - P. 10.
1 –
Mezzotint
NOT SEEN
In: *Art Index*, 6 (1944–1947): 722.

Invention of, improvements on, or additions to, roller printing presses / to Edward Cartwright.
In: The London journal of arts and sciences. - Vol. 10 (1824). - P. 133.
§ The journal was also known as: Newton's journal.
English patent: A.D. 1824, July 27.–№ 4992 (two).
Title description after photocopy.
3 –
Press
In: *Woodcroft 1969*: 171–172.

Transparent paper, for the use of engravers and painters / [contributing letter by] R[ichard] D. Cathery.
In: Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce. - Vol. 30 (1813). - P. 116–118.
§ The letter is dated, p. 117: 'No. 13, Mead Row, near the Asylum'.
Cathery was awarded 'Five Guineas' for his transparent paper.
1 –
Line Engraving / Line Etching
In: UBU.

How to make a drypoint / S. Chamberlain.
In: American architect. - (1931), no. 140 (Oct.). - P. 22–25.
NOT SEEN
In: *Art Index* 1 (1929–1932): 464.

Practical notes on etching / by Rich[ard] S[amuel] Chattock.
In: The etcher. - Vol. 2 (1880), (May–Dec.). - P. 9–10, 12, 14, 16, 17–18, 19–20, 21–22, 24. Vol. 3 (1881), (Jan.–June, Aug.–Dec.). - P. 2, 4, 6, 8, 10, 11–12, 15–16, 17–18, 20, 22, 24. Vol. 4 (1882), (Jan.–June). - P. 2, 3–4, 10, 12, 16, 18. - (Etcher Notes).
With literature.
§ The journal is published monthly and contains a series 'Etcher Notes' with its own paging.

The etcher, vol. 4 (1882), (June), p. 18: '"Practical notes on etching" reprinted from "The Etcher Notes", with considerable additions and alterations, and illustrated by etchings, will shortly be published'; this is: **Chattock** (London 1882) [No. 065]. The monograph is largely the same as the text in the articles, a few paragraphs were added, with some minor changes and with additional illustrations.
Title description after photocopy.
1 –
Drypoint / Electrolytic Etching / Line Etching
2 –
Copper / Steel / Steelfacing / Zinc
3 –
Chine Collé / Printing in Black / Paper / Press
In: *Bridson & Wakeman 1984*: no. B27; ULC.

Christ (John George)   413.1

Patent … for improvements in copper-plate and other printing / granted to John George Christ, communicated by a Foreigner.
In: Repertory of arts, manufactures and agriculture. - Vol. 6, third series (1828). - P. 254–256.
§ It is not known who is this 'Foreigner'.
English patent: A.D. 1827, February 14.–№ 5463.
Title description after photocopy.
3 –
Paper
In: *Bridson & Wakeman 1984*: no. B99; UBA; *Woodcroft 1969*: 175.

413.2

Certain improvements in copper and other plate printing / John George Christ.
In: Repertory of arts and sciences. - Vol. 8, third series (1828?). - P. 51.
§ Same article as in: Repertory of arts and sciences. - Vol. 6, third series (1828). - P. 254–256.
NOT SEEN
In: UBA; *Woodcroft 1969*: 175.

413.3

Certain improvements in copper and other plate printing / John George Christ.
In: London journal of arts and sciences. - Vol. 1, second series (1828). - P. 229–230.
§ Same article as in: Repertory of arts and sciences. - Vol. 6, third series (1828). - P. 254–256.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B99; UBA; *Woodcroft 1969*: 175.

413.4

Certain improvements in copper and other plate printing / John George Christ.
In: Register of arts and sciences. - Vol. 1, new series [(1828)?]. - P. 83.
§ Same article as in: Repertory of arts and sciences. - Vol. 6, third series (1828). - P. 254–256.
NOT SEEN
In: *Woodcroft 1969*: 175.

413.5

Certain improvements in copper and other plate printing / John George Christ.
In: Engineers' and mechanics' encyclopaedia. - Vol. 1, new series [(1828)?]. - P. 470.
§ Same article as in: Repertory of arts and sciences. - Vol. 6, third series (1828). - P. 254–256.
NOT SEEN
In: *Woodcroft 1969*: 175.

413.6

Certain improvements in copper and other plate printing / John George Christ.
In: Patent journal. - Vol. 2, new series [(1828)?]. - P. 582.
§ Same article as in: Repertory of arts and sciences. - Vol. 6, third series (1828). - P. 254–256.
NOT SEEN
In: *Woodcroft 1969*: 175.

413.7

Certain improvements in copper and other plate printing / John George Christ.
In: Webster's reports. - Vol. 1, new series [(1828)?]. - P. 83.
§ Same article as in: Repertory of arts and sciences. - Vol. 6, third series [(1828?)]. - P. 254–256.
NOT SEEN
In: *Woodcroft 1969*: 175.

413.8

Certain improvements in copper and other plate printing / John George Christ.
In: Webster's patent law. - P. 27, 47, 67, 88, 108, 132.
§ Same article as in: Repertory of arts and sciences. - Vol. 6, third series [(1828)?]. - P. 254–256.
NOT SEEN
In: *Woodcroft 1969*: 175.

413.9

Certain improvements in copper and other plate printing / John George Christ.
In: Carpmael's reports on patent cases. - Vol. 1, new series [(1828)?]. - P. 463.
§ Same article as in: Repertory of arts and sciences. - Vol. 6, third series (1828). - P. 254–256.
NOT SEEN
In: *Woodcroft 1969*: 175.

Certain improvements in copper and other plate printing / John George Christ.
In: Russell's reports. - Vol. 5, new series [(1828)?]. - P. 322.
§ Same article as in: Repertory of arts and sciences. - Vol. 6, third series (1828). - P. 254–256.
NOT SEEN
In: *Woodcroft 1969*: 175.

Christos (Christine)
See: **Semenoff** (Nik) & **Christos** (Christine) [No. 580].

Clarke (Richard)   414

Easel printing / Richard Clarke.
In: Printmaking today. - Vol. 14 (2005), no. 1 (spring). - P. 22–23.
1 –
Carborundum Print
3 –
Mulitple-plate Printing
In: Priv.Coll.

Claudet (Antoine Jean) 415

Verfahren die Daguerre'schen Lichtbilder zu äzen, sodaß davon wie von gestochenen Kupferplatten Abdrüke gemacht werden können / Antoine Jean Claudet.
In: Polytechnisches Journal. - Vol. 25 (1844), no. 93. - P. 459–464.
§ Title means: Manner of etching daguerreotypes in order to print them like engraved copper plates
See also: **Fizeau** (1844) [No. 443].
1 –
Photomechanical Etching
2 –
Silver
4 –
Photography
In: UBA.

Colla (…)   416.1

[On hardening steel plates] / […] Colla.
In: Bulletin de la Société d'encouragement pour l'industrie nationale. - (1842), (April). - P. 159.
§ Polytechnische Journal: 'Descript. des Brevets. Bd. XLII'.
1 –
Line Engraving / Line Etching
2 –
Steel
NOT SEEN
In: *Polytechnisches Journal* and *Tijdschrift*, see [No. 416.2].

416.2

Colla's Verfahren Stahlplatten zu härten.
In: Polytechnisches Journal. - Vol. 23 (1842), no. 85. - P. 202–204.
In: UBA.

416.3

Manier van Colla om stalen platen te harden / technieken naar […] Colla.
In: Tijdschrift ter bevordering van Nijverheid. - Vol. 8 (1844), no. 3. - P. 386–389.
In: KB.

Collier (Edward G.)   417

Acid test / Edward G. Collier.
In: Printmaking today. - Vol. 1 (1991), no. 2 (spring). - P. 22.
§ Tests for used acid.
1 –
Line Etching
In: Priv.Coll.

Coode 1 (Caroline)   418

DIY mangle conversion / Caroline Coode.
In: Printmaking today. - Vol. 7 (1998), no. 2 (summer). - P. 25–26 : [4] ill.
§ About the conversion of a mangle (clothwringer) to an intaglio roller press.
3 –
Press
In: Priv.Coll.

Coode 2 (Caroline)   419

Cut and paste / Caroline Coode.

In: Printmaking today. - Vol. 8 (1999), no. 3 (autumn). - P. 29 : [1] ill.
1 –
Collagraph
3 –
Printing à la Poupée / Relief Printing
In: Priv.Coll.

<div style="text-align: right">Cooke (William John)   420.1</div>

Biting-in on steel plates / [contributing letter by] W[illiam] [John] Cooke jun.
In: Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce. - Vol. 44 (1826). - P. 48–52 : [1] ill.
Supplier: p. 52.
§ The letter is dated, p. 48: '5, Seymour-street North, Clarendon-square, December 21, 1825'.
Cooke was awarded the 'Gold Isis Medal' for his etching process.
'W. Cooke junior and William Humphrys were each awarded the Gold Isis Medal in 1825 and 1826 for their work on etching fluids concerned with the differing requirements of hard and soft steel'; *Hunnisett 1980*: 48–49. The articles of Cooke and Humphrys are placed immediately after each other in the Transactions and in The Franklin Journal, see: **Humphrys** (William) [Nos. 487.1 and 487.3].
1 –
Line Etching
2 –
Steel
5 –
Aesthetics
In: *Hunnisett 1980*: 48 n. 35; UBU.

<div style="text-align: right">420.2</div>

Biting-in on steel plates / W[illiam] [John] Cooke jun.
In: Repertory of patent inventions. - (1827), (March).
NOT SEEN
In: *Der Handwerker*, see [No 420.4].

<div style="text-align: right">420.3</div>

On an improved mode of etching steel plates / W[illiam] [John] Cooke.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 3 (1827), no. 4 (April). - P. 250–252.
Supplier: p. 251.
§ The literal text of the Transactions, but without the illustrations.
The articles of Cooke and Humphrys are placed immediately after each other in the Transactions and in The Franklin Journal, see: **Humphrys** (William) [Nos. 487.1 and 487.3]
Title description after photocopy.
In: OCLC; *Poole 1882* (Etching).

<div style="text-align: right">420.4</div>

Verbessertes Verfahren bei'm Aetzen von Stahlplatten / W[illiam] [John] Cooke.
In: Der Handwerker und Künstler Fortschritte und Muster. - Vol. 2 (1827), no. 36 (May). - Col. 194–196 : [1] woodcut.
In: **Henrici** (Leipzig 1834) [No. 142]; NSUG.

<div style="text-align: right">420.5</div>

Over het etsen in staal / [recipe after William John Cooke].
In: Tijdschrift ter bevordering van nijverheid. - Vol. 3 (1835), no. 3. - P. 549
§ Gives Cooke's recipes with some additional text, but without references.
In: KB.

<div style="text-align: right">Crujera (Alfonso)   421</div>

Grabado electrolítico : una técnica de grabado no tóxico /Alfonso Crujera.
In: Grabado y edición. - Año I (2006), no. 1 (marzo). - P. 20–25 : [6] ill. of which [2] in colour. - (Ensayo).
1 –
Electrolytic Etching
2 –
Copper / Zinc
5 –
Health and Safety
In: Priv.Coll.

D

<div style="text-align: right">Dada (Sairah Ali)   422</div>

Preparing the ground / Sairah Ali Dada.
In: Printmaking today. - Vol. (2002), no. 3 (autumn). - P. 28.
§ How to make a crackle ground and how to prepare soft-ground.
1 –
Aquatint / Soft-ground

In Priv.Coll.

Deleschamps (Pierre)   423.1

Rapport sur un nouveau mordant pour la gravure sur acier / présenté par M. Deleschamps ; rapport fait par A. Chevallier au nom d'une commission spéciale.
In: Bulletin de la Société d'encouragement de l'industrie nationale. - (1835), no. CCCLXXI (May). - P. 266–276 [?].
§ Title means: Report about a new mordant for engraving steel
A copy of this article is bound with: **Deleschamps** (Paris 1836) [No. 075]: before the text.
Dating: 'Approuvé en séance, le 13 mai 1835'.
For comments on the mordants see: **Elsner** (1838) [No. 436].
NOT SEEN
In: *Polytechnisches Journal*, see [No. 423.2].

423.2

Bemerkungen über die Glyphogene oder eine neue Beize für den Stahlstich / von [Pierre] Deleschamps.
In: Polytechnisches Journal. - Vol. 16 (1835), no. 58. - P. 35–42.
§ For comments on the mordants see: **Elsner** (1838) [No. 436].
1 –
Line Etching
2 –
Steel
In: UBA.

Desmaiseau 1 (Pierre)   424

Extrait d'une lettre écrite de Londres le 27. Mars 1721 / [Pierre Desmaiseau].
In: Journal des sçavans. - (1721), no. 16 (28 April). - P. 256.
§ Title means: Excerpt of a letter written in London on 27 March 1721
The correspondent's name is not mentioned, but he refers to his next letter, which is signed, see: **Desmaiseau 2** (1722) [No. 425].
The letter is in the Paris edition of the *Journal des sçavans*, not in the Amsterdam edition.
Concerns Le Blon's activities in colour printing.
3 –
Multiple-plate Printing / Printing Polychrome
In: KB; **Le Blon** (Stuttgart 1985) [No. 180.7]: 31–32, 138–139; *Rodari 1996*: 56; UBG.

Desmaiseau 2 (Pierre)   425

Lettre ecrite de Londres par M. Des-Maiseaux, membre de la Societé Royale, à M. l'Abbé de Veissiere, censeur royal des livres, à Paris, touchant l'art d'imprimer des tableaux & des portraits en couleur, &c. / Pierre Desmaiseau.
In: Journal des sçavans. - (1722), no. 20 (18 may). - P. 316–318.
§ Title means: Letter written in London by Mr Des-Maiseaux, member of the Royal Society, to Mr Abbot De Veisiere, royal censor of books, in Paris, concerning the art of printing paintings and portraits in colour, etc.
The letter is dated, p. 316: 'A Londres, le 28. Février 1722'.
The letter is in the Paris edition of the *Journal des sçavans*, not in the Amsterdam edition.
Concerns Le Blon's activities in colour printing.
Title description after photocopy.
2 –
Copper
3 –
Multiple-plate Printing / Printing Polychrome
In: **Desmaiseau 1** (1721) [No. 424]; KB; **Le Blon** (Stuttgart 1985) [No. 180.7]: 32–34, 139; *Rodari 1996*: 56–57; UBL.

Dickenson (...)   426.1

Dickensons's improvements in paper.
In: The mechanics magazine : museum, register, journal and gazette. - Vol. 64 (1856), (17 May). - P. 469.
§ Concerns a 'Patent dated Oct. 3, 1855'. The patent is not in *Woodcroft 1969*.
Title description after photocopy.
3 –
Paper / Printing in Black
4 –
Lithography
In: NSM; TUD; TUT.

426.2

Papier anzufertigen, das gleichzeitig zu Kupferstichen und Litografien dient / von [...] Dickinson.
In: Gutenberg : Zeitschrift für Buchdrucker, Schriftgießer, Zeichner, Holzschneider, Graveurs, Stein- und Kupferdrucker, Galvanografen, Stilografen, Chimitipisten, Fotografen, Galvanoplastiker, Buchbinder, Glasätzer etc. - Vol. 2 (1856), no. 12. - P. 91.
§ Summary of the above article on making paper suitable for both printing engravings and lithographs.
In: Priv.Coll.; UBA.

Dickinson (C.W.)   427

Copper, steel, and bank-note engraving / C.W. Dickinson.
In: Popular Science Monthly. - Vol. 46 (1897–1898[?]). - P. 597.
1 –
Line Engraving

2 –
Copper / Steel
NOT SEEN
In: *Poole 1892* (Engraving).

Donné (Alfred)   428.1

[Manner of printing daguerreotypes as copper plates] / [Alfred Donné].
Echo du monde savant. - (1840), no. 547.
NOT SEEN
In: *Polytechnisches Journal* [No. 428.2].

428.2

Verfahren die Daguerre'schen Lichtbilder wie Kupferplatten abzudrucken. In: Polytechnisches Journal. - Vol. 21 (1840), no. 77. - P. 159.
§ Title means: Manner of printing daguerreotypes as copper plates
Summary of Donné's experiments.
See also: **Berres** (1840) [No. 387].
1 –
Photomechanical Etching
2 –
Copper / Silver / Steelfacing
4 –
Photography
In: UBA.

Dove 1 (Elizabeth)   429

How to make a highly efficient and inexpensive exposure unit / Elizabeth Dove.
In: Printmaking today. - Vol. 5 (1996), no. 3 (autumn). - P. 24–25 : [4] ill.
§ Concerns an exposure unit for photopolymer film.
Elizabeth Dove was an assistant of Keith Howard, see: **Howard** (Grande Prairie 1998) [No. 151]: iv.
2 - Photopolymer Film
In: Priv.Coll.

Dove 2 (Elizabeth)   430

Dove-Howard-Type / Elizabeth Dove.
In: Printmaking today. - Vol. 5 (1996), no. 4 (winter). - P. 27–28 : [3] ill.
§ Concerns manipulating photopolymer film.
Elizabeth Dove was an assistant of Keith Howard, see: **Howard** (Grande Prairie 1998) [No. 151]: iv.
2 - Photopolymer Film
In: Priv.Coll.

Druk-inkt   431

Druk-inkt.
In: Laurens Coster : tijdschrift voor beoefenaren en voorstanders der boekdrukkunst. - Vol. 8 (1865). - P. 145–148, 178–182, 205–210. Vol. 9 (1866). - P. 122–130.
§ Title means: Printing ink
2 –
Copper
3 –
Chine Collé / Ink
In: KB; SBH; UBA; UBU.

Dull (Keith) 432

Hot wax / Keith Dull.
In: Printmaking today. - Vol. 12 (2003), no. 3 (autumn). - P. 22–23 : [2] ill. in colour.
§ The inked intaglio plate is printed onto wax-coated paper, a method called 'encaustic intaglio'.
3 –
Ink
In: Priv.Coll.

Durand (Amédée)   433.1

[Saulnier's manner of rocking mezzotint plates by machine] / Amédée Durand.
In: Bulletin de la Société d'encouragement pour l'industrie nationale. - (1833) (Sep.). - P. 309–[…].
NOT SEEN
In: *Polytechnisches Journal*.

433.2

Bericht des Hrn. Amédée Durand über eine von Hrn. Saulnier d. älteren, Mechaniker zu Paris, rue Saint-Ambroise-Papincourt No. 5, erfunde
Methode die Kupferplatten für die sogenannte Schwarzkunst zuzubereiten.
In: Polytechnisches Journal. - Vol. 15 (1834), no. 51. - P. 114–116.
1 –
Mezzotint

2 –
Steel
In: UBA.

Durand (Cyrus)   434

Specification of a patent for an improvement in the copper-plate printing press, by which printing is executed with greater facility than on the ordinary press. Granted to Cyrus Durand, New York, May 22, 1828 / Cyrus Durand.
In: Journal of the Franklin Institute of the State of Pennsylvania; devoted to the mechanic arts, manufactures, general science, and the recording of American and other patented inventions. - Vol. 4, new series (1829), no. 1 (July). - P. 72.
§ 'Vol. 4, new series' is 'vol. 8' in the original numbering.
Title description after photocopy.
3 –
Press
In: LC.

E

Eby (Kerr)   435

Etching - Part II: Technique / Kerr Eby.
In: Print. - Vol. 2 (1941), no. 2 (Summer). - P. 41–51 : [12] fig.
§ Pt. 1 in vol. 2 (1941), no. 1 (May–June), pp. 47–59: Etching and drypoint, part I: background / Robert McDonald; this is art historical.
For part III see: **Strang 2** (1941) [No. 596].
The figures show the different steps of making an etching.
1 –
Line Etching
2 –
Copper
3 –
Printing in Black
In: RMA.

Elsner (L.)   436.1

Ueber eine neue Aezbeize in Stahl / von L. Elsner.
In: Journal für praktische Chemie. - Vol. 12 (1838 [?]), no. 5.
§ Title means: On a new mordant for steel
NOT SEEN
In: *Polytechnisches Journal* [No. 436.2].

                                                                        436.2

Ueber eine neue Aezbeize in Stahl / von L. Elsner.
In: Polytechnisches Journal. - Vol. 19 (1838), no. 67. - P. 443–446.
§ With comments by Elsner on the recipes for mordants by **Delechamps** (1835) [No. 423], **Turrell 2** (1824) [No. 605] and a third recipe. He finds the recipes unclear, dangerous and they dissolve the etching ground, and gives details for an improved recipe.
1 –
Line Etching
2 –
Steel
In: UBA.

Engraved on steel   437.1

Engraved on steel.
In: All the year round. - Vol. 16 (1866), (27 Oct.). - P. 372–376.
§ The magazine is 'conducted by Charles Dickens' and the style of writing is Dickensian.: 'Beneath the comic overtones lies an accurate account of the engraver's view of his work, highlighting his pressure and frustration. ... Even the names possess the famous Dickensian touches, and conjure up most vividly the people concerned; the technical description is just as effective'; *Hunnisett 1980*: 33.
'I fear it's not possible to suppose that Charles Dickens himself was the author ... The author of "Engraved on Steel" has not been identified ... Soon after [Dickens's] death, attempts began to gather together all of his contributions to the journal [All the Year Round]. No one suggested this was one. So the presumption must be that it wasn't't'; letter of David Parker, 14 april 1998, via The Dickens House Museum.
Title description after the photomechanical reprint in *Hunnissett 1980* [No. 437.2].
1 –
Line Etching / Stipple Engraving
2 –
Steel
3 –
Printing in Black
In: BLBS; *Hunnisett 1980*: 33, 241–246; *Poole 1882* (Engraving).

Engraved on steel.
In: Steel-engraved book illustration in England / Basil Hunnisett. - London : Scolar Press, 1980. - P. 241–246.
§ Photomechanical reprint of: 1866 [No. 437.1].
1 –
Line Etching / Stipple Engraving
2 –
Steel
3 –
Printing in Black
In: Priv.Coll.

Engravers' plates   438

Engravers' plates.
In: Art union. - Vol. 9 (1847).- P. 362.
Supplier: p. 362.
Title description after photocopy.
2 –
Copper / Steel
In: BL; *Bridson & Wakeman 1984*: no. B107.

Etching for copper-plate printing
See: **Haden** (Seymour) [No. 469].

Etching ground recipe 439

[Etching ground recipe].
In: Chemische Technologie / [Karl] Karmarsch. - Vol. 1 [c. 1850?]. - P. 447.
§ The etching ground recipe is perhaps copied from one of the editions of the German translation of Ure's dictionary (1st ed.: London 1839): Technisches Wörterbuch / übersetzt von Karl Karmarsch, Friedrich Heeren. - [1st ed.]. - Prag : Haase, 1843–1844. This first edition or a later edition: vol. 1, p. 477.
See also: **Lawrence** (1843) [No. 504].
1 –
Line Etching
NOT SEEN
In: **Roller** (Wien 1888) [No. 270.1]: 31.

F

Farey (John)   440

An instrument for describing or drawing ellipses of various forms and sizes / [two contributing letters by] John Farey ; drawn by J[ohn] Farey ; engr. by Ja[me]s Davis.
In: Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce. - Vol. 31 (1813). - P. 117–130 : pl. 4–5.
§ Farey was awarded the 'Gold Medal' for his instrument (p. 117).
The contributing letters are dated, pp. 118 and 130 respectively: 'No. 12, Crownstreet, Westminster, March 2d, 1813' and 'No. 12, Crownstreet, Westminster, Dec. 6th. 1813'.
Pl. 4 has detailed designs for the Elliptograph, pl. 5 contains specimens.
1 –
Line Etching
2 –
Copper
In: UBU.

Figueras Ferrer, Eva (1993)
See: **Método** (1993) [No. 206.2].

Figueras Ferrer (Eva)   441

Un taller de grabado sostenible : propuesta de materiales menos tóxicos y minimización de residuos / Eva Figueras Ferrer.
In: Grabado y edición. - Año III (2008), no. 12 (enero). - P. 48–53 : 5 fig. in colour. - (Proceso técnico).
§ Title means: A sustainable printmaking workshop: a suggestion for less toxic materials and minimising waste
See also: **Figueras Ferrer** (Barcelona 2004) [No. 101].
1 –
Aquatint / Line Etching
2 –
Zinc
3 –
Ink
5 –

Health and Safety
In: Priv.Coll.

Fine art of copper & steel-plate printing.
In: Paper & printing trades journal. - (1888), no. 62. - P. 9.
3 –
Paper
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B72

[Manner for etching Daguerreotypes in order to print them like engraved copper plates.] / Hippolyte L. Fizeau.
In: Comptes rendus. - (1844), no. 2 (2nd semester).
NOT SEEN
In: *Polytechnisches Journal* [No. 443.2].

Verfahren die Daguerre'schen Lichtbilder zu äzen, sodaß davon wie von gestochenen Kupferplatten Abdrüke gemacht werden können / Hippolyte L. Fizeau.
In: Polytechnisches Journal. - Vol. 25 (1844), no. 93. - P. 215–216.
§ Title means: Manner of etching daguerreotypes in order to print them as engraved copper plates
See also: **Claudet** (1844) [No. 415].
1 –
Photomechanical Etching
2 –
Silver / Steelfacing
4 –
Photography
In: UBA.

Reinigen met VCA / Sytse Folkertsma en Ad Stijnman.
In: kM. - (1995), no. 13 (spring). - P. 39.
§ Title means: Cleaning [printing plates] with VCA
See also: **Stijnman 2** (1994) [No. 590].
5 –
Health and Safety
In: Priv.Coll.; RCE.

Cleaning printing plates and brushes with VCA / by Sytze Folkertsma, Peter Sincovitz and Ad Stijnman.
In: Printmaking today. - Vol. 5 (1996), no. 1 (spring). - P. 25–26.
§ See also: **Stijnman 2** (1994) [No. 590].
5 –
Health and Safety
In: Priv.Coll.; RCE.

Drypoint on celluloid / E.E. Foss.
In: School arts magazine. - Vol. 31 (1931), (April). - P. 467–469.
1 –
Drypoint
2 –
Plastic
NOT SEEN
In: *Art Index*, 1 (1929–1932): 464.

Steel plates for engraving / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 59–61.
Supplier: p. 61.
§ *Bridson & Wakeman*: 'An informative series of articles dealing with materials and methods. Possibly by G. Francis, editor of the Magazine.'
Title description after photocopy.
1 –
Line Engraving / Line Etching
2 –
Steel
4 –
Troubleshooting

5 –
Art History
In: BL; *Bridson & Wakeman 1984*: no. B104

Engraving / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 132–133.
Literature: p. 132.
§ Title description after photocopy.
1 –
Drypoint / Line Engraving / Line Etching
2 –
Copper
In: ICL.

Engraving / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 174–175.
Literatuuropgave: p. 175.
Suppliers: p. 175.
§ Title description after photocopy.
1 –
Line Etching
2 –
Copper / Steel
In: ICL.

Engraving / [G. Francis?]
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 205–206.
§ Title description after photocopy.
1 –
Line Etching
2 –
Copper / Steel
In: ICL.

Engraving / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 246–247.
§ Title description after photocopy.
1 –
Line Etching
2 –
Copper
In: BL.

Engraving / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 277–278.
§ The author was an experienced etcher, p. 278: 'We have thus minutely described the process of etching, as we have long practised it.'
Title description after photocopy.
1 –
Line Etching
2 –
Copper
4 –
Troubleshooting
In: BL.

Aqua tinta engraving / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 292.
§ Title description after photocopy.
1 –
Aquatint / Lift-ground
2 –
Copper
5 –
Art History
In: OCLC; *Bridson & Wakeman 1984*: no. B 16.

Aqua and mezzotinting / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 331–332.
§ Title description after photocopy.
1 –

Aquatint / Lift-ground / Mezzotint
2 –
Copper / Steel
5 –
Art History
In: OCLC; *Bridson & Wakeman 1984*: no. B 16.

447.9

Line engraving / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 383–384.
§ Title description after photocopy.
1 –
Crayon Engraving / Drypoint / Line Engraving / Stipple Engraving
2 –
Copper
In: OCLC; *Bridson & Wakeman 1984*: no. B 16.

447.10

Engraving in imitation of black-lead or chalk / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 3 (1842). - P. 398–399.
§ Title description after photocopy.
1 –
Crayon Etching / Lift-ground
2 –
Copper
In: OCLC; *Bridson & Wakeman 1984*: no. B 16.

447.11

Etching ground for engravers / [G. Francis?].
In: The magazine of science, and school of arts. - Vol. 4 (1843). - P. 127–128.
§ Title description after photocopy.
1 –
Line Etching
2 –
Copper
In: *Bridson & Wakeman 1984*: no. B 105; ICL.

Franklin (Richard)   448

Wood etching / Richard Franklin.
In: Printmaking today. - Vol. 5 (1996), no. 2 (summer). - P. 28–29 : 3 fig.
Literature: p. 29.
1 –
Line Etching
2 –
Wood
3 –
Relief Printing
In: Priv.Coll.

Furchau 1 (…)   449.1

[On printing plates made of primed textile] / […] Furchau.
In: Verhandlungen des Vereins zur Beförderung des Gewerbfleißes in Preußen. - (1846), no. 5.
§ For comments on this process, see: **Furchau 2** [No. 450].
NOT SEEN
In: *Polytechnisches Journal*, see [No. 449.2].

449.2

Beschreibung des Verfahrens zur Anfertigung und Benutzung der elastischen Radirungsplatten / von […] Furchau.
In: Polytechnisches Journal. - Vol. 28 (1847), no. 103. - P. 172–187.
§ Title means: Description of the process for making and using elastic etching plates.
Concerns printing from a plate made of primed canvas
1 –
Drypoint
2 –
Primed Canvas
3 –
Ink / Printing in Black
In: UBA.

Furchau 2 (…)   450.1

[On Furchau's elastic printing plates made of primed textile].
In: Verhandlungen des Vereins zur Beförderung des Gewerbfleißes in Preußen. - (1847).
§ Comments on Furchau's printing plates made of primed canvas, see: **Furchau 1** (1846) [No. 449].
1 –

Drypoint
2 –
Primed Canvas
3 –
Ink / Printing in Black
NOT SEEN
In: *Polytechnisches Journal*, see [No. 450.2].

<div align="right">450.2</div>

Ueber Furchau's elastische Radirungsplatten.
In: Polytechnisches Journal. - Vol. 28 (1847), no. 104. - P. 313.
§ Title means: On Furchau's elastic etching plates
In: UBA.

G

<div align="right">**Gaiffe** (…)   451</div>

Cobalt as a coating for plates / […] Gaiffe.
In: The printing times and Lithographer. - New series, vol. 4 (1878), (15 Aug.). - P. 171.
1 –
Copper
2 –
Steelfacing
In: UBL.

<div align="right">**Gautier-Dagoty 1** (Jacques-Fabien) 452.1</div>

[Anouncement of new anatomical prints by Jacques-Fabien Gautier-Dagoty].
In: Mercure de France. - (1748), (Dec.), 2nd vol. - P. 178–180.
§ Title description after photocopy.
With comment on: **Robert 1** (1748, Nov.) [No. 566].
Commented by: **Robert 2** (1749, June) [No. 567].
3 –
Multiple-plate Printing / Printing Polychrome
In: *Deville 1973*: 103; HAB; UBF.

<div align="right">452.2</div>

[Anouncement of new anatomical prints by Jacques-Fabien Gautier-Dagoty].
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 55 (July–Dec. 1748; 1970). - P. 399–400.
In: KB.

<div align="right">**Gautier-Dagoty 2** (Jacques-Fabien) 453.1</div>

Lettre à M. de Boze, de l'Académie Françoise, & Honoraire de l'Académie de Peinture & Sculpture, Garde des médailles & pierreries du Cabinet du Roi, &c. / [Jacques-Fabien] Gautier[-Dagoty].
In: Mercure de France. - (1749), (July). - P. 158–172 : [1] pl.
§ Title means: Letter to M. de Boze, of the l'Académie Françoise, & Honoraire de l'Académie de peinture & sculpture, curator of the medals and gems at the Cabinet du Roi, etc.
First part of a contributing letter. For the second part see: **Gautier-Dagoty 3** (October 1749) [No. 454.1].
Gautier's letter is followed and commented by: **Montdorge 1** (1749, July) [No. 521].
Pl. accompanying pp. 169–172. The plate is a mezzotint printed in blue, red, yellow and black showing the palette with which Gautier demonstrated his system of colour printing.
Photomechanical repr.: Genève 1970 [No. 453.3].
1 –
Mezzotint
3 –
Multiple-plate Printing / Printing Polychrome
In: *Deville 1973*: 103 ('Gravure en couleurs'); *Figueras Ferrer 1992*: 1047; HAB; **Le Blon** (Stuttgart 1985) [No. 180.7]: 120–121, 143, 146; *Rodari 1996*: 65, 128, 146; UBF.

<div align="right">453.2</div>

Observations sur la peinture et sur les tableaux anciens et modernes / par [Jacques-Fabien] Gautier [Dagoty]. - Paris : Jorry et Delaguette, 1753. - I–xvij, 19–356, I–v p. : [2] folding pl. ; […] cm.
§ Approbation, p. xv: 'A Paris, le 4 Octobre 1751. Philippe de Pretot.'
Privilege du Roy, p. xviij: 'a Paris, ce 26 Octobre 1751'.
Approbation, p. xviij: 'Donné à Paris, le 15 Février 1753. Philippe de Pretot.'
Title description after: Genève 1973 [No. 453.4].
Contains the following texts concerning Gautier's printing in colours and his claim on printing in four colours.
– Lettre à M. de Boze, de l'Académie Françoise, & Honoraire de l'Académie de Peinture & Sculpture, &c.: pp. 121–138.
§ This is the same text as published in the *Mercure*, with some minor differences in spelling, see: (1749, July) [No. 453.1].
– Seconde lettre * à M. de Boze, sur le système des quatre couleurs primitives de M. Gautier: pp. 139–150, [1] colour pl.
§ The colour plate is a palette for demonstrating Gautier's system of colour printing. It is of the same design as, although different, from the one in

the *Mercure* of 1749.
– Effet des quatre couleurs primitives du Sr Gautier dans les trois clefs de la peinture: pp. 150–151.
– Preuves contre le Blond & ses elèves en trois couleurs. Extrait du Journal de Trévoux, du mois d'Août, pag 1442: pp. 152–156.
– Lettre de M. de M*** écrite à M. Gautier, le 6 Décembre 1739: pp. 157–158.
NOT SEEN
In: BNP; UBB; V&A.

453.3

Lettre à M. de Boze, de l'Académie Françoise, & Honoraire de l'Académie de peinture & sculpture, Garde des médailles & pierreries du Cabinet du Roi, &c. / [Jacques-Fabien] Gautier[-Dagoty].
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 57 (July–Dec. 1749; 1970). - P. 46–49 : [1] colour pl. ; 31 cm.
§ The figure reproduces the palette printed in blue, yellow, red and black.
Photomechanical reprint of: 1749 [No. 453.1].
In: KB; KVK.

453.4

Observations sur la peinture et sur les tableaux anciens et modernes / par [Jacques-Fabien] Gautier [Dagoty]. - Réimpression. - Genève : Minkoff Reprint, 1973. - I–v, 19–356, I–v p. : [2] folding reprod. ; 22 cm.
Photomechanical reprint of: Paris 1753 [No. 453.2].
In: KB; KVK.

Gautier-Dagoty 3 (Jacques-Fabien) 454.1

De la lettre sur le systême des quatre couleurs primitives du Sr [Jacques-Fabien] Gautier [-Dagoty].
In: Mercure de France. - (1749), (Oct.). - P. 102–119.
§ Title means: Of the letter concerning the system of four primary colours by Mr [Jacques-Fabien] Gautier [-Dagoty]
Second part of a contributing letter. For the first part see: **Gautier-Dagoty 2** (July 1749) [No. 453.1].
3 –
Multiple-plate Printing / Printing à la Poupée / Printing Polychrome
In: *Deville 1973*: 103 (Gravure en couleurs); HAB; **Le Blon** (Stuttgart 1985) [No. 180.7]: 120–121, 146; *Rodari 1996*: 128; UBF.

454.2

De la lettre sur le systême des quatre couleurs primitives du Sr [Jacques-Fabien] Gautier [-Dagoty].
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 57 (July–Dec. 1749; 1970). - P. 201–205.
In: KB.

Gautier-Dagoty 4 (Jacques-Fabien) 455.1

Lettre à l'auteur du Mercure, & réponse à la letttre [*sic*] anonyme inserée dans le premier volume de Décembre, sur l'invention d'imprimer les tableaux / [Jacques-Fabien] Gautier [-Dagoty].
In: Mercure de France. - (1756), (Jan.), vol. 2. - P. 189–203.
§ Title means: Letter to the author of the Mercure, and answer to the anonymous letter entered in the first volume of December, about the invention of printing paintings
Comment on: **Montdorge 2** (1755) [No. 522]. For replies on this letter see: **Montdorge 3** (1756) [No. 523] and **Robert 2** (1756) [No. 567].
3 –
Multiple-plate Printing / Printing Polychrome
In: *Deville 1973*: 103 (Gravure en couleurs); HAB; *Rodari 1996*: 128.

455.2

Lettre à l'auteur du Mercure, & réponse à la letttre [*sic*] anonyme inserée dans le premier volume de Décembre, sur l'invention d'imprimer les tableaux / [Jacques-Fabien] Gautier [-Dagoty].
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 70 (Jan.–June 1756; 1970). - P. 112–115.
In: KB.

Gautier-Dagoty 5 (Jacques-Fabien) 456

Lettres à l'auteur du Mercure sur l'invention et l'utilité de l'art d'imprimer les tableaux / par [Jacques-Fabien] Gautier[-Dagoty] ; red. P.L.
In: Revue universelle des arts. - Vol. 21 (1865). - P. 306–324.
§ Title means: Letters to the author of the Mercure about the invention and utility of the art of printing paintings
The following two letters were refused by the editors of the Mercure de France in 1756.
First letter: pp. 307–317.
§ The letter is dated: 'A Paris, ce 13 mars 1756. Gautier'.
Gautier expresses himself rather spitefully against his anonymous opponent (**Montdorge 2** (1756) [No. 522]) and suggests a match to see who can best reproduce a painting.
Second letter: pp. 317–324.
§ The letter is dated: 'A Paris, ce 15 avril 1756. Gautier'.
Gautier starts by complaining (p. 317) that his first letter was not published in the Mercure de France, whereas Robert's letter was, see: **Robert 3** (1756) [No. 568].
3 –
Multiple-plate Printing / Printing Polychrome
In: HAB; **Le Blon** (Stuttgart 1985) [No. 180.7]: 121; *Rodari 1996*: 128.

Gehlen (…) 457

[Varnish for etching] / […] Gehlen.
In: […]. - ([c. 1850?]).
1 –
Line Etching

NOT SEEN
In: *Winckler 2003*, repr. of the ed. 1859: 117, n. ***.

George (...) 458.1

[Manner to correct engraved lines by copperfacing] / […] George.
In: Comptes rendus de l'Academie des Sciences [?]. - Vol. 43 (1857 [?]).
NOT SEEN
In: *Gutenberg*, see [No. 458.2].

458.2

Verfahren, auf einer gravirten Kupferplatte Aenderungen vorzunehmen / von […] George.
In: Gutenberg : Zeitschrift für Buchdrucker, Schriftgießer, Zeichner, Holzschneider, Graveurs, Stein- und Kupferdrucker, Galvanografen, Stilografen, Chimitipisten, Fotografen, Galvanoplastiker, Buchbinder, Glasätzer etc. - Vol. 2 (1857), no. 14. - P. 110.
1 –
Line Engraving / Line Etching
2 –
Copper / Steelfacing
In: Priv.Coll.; UBA.

Gill 1 (Thomas)   459

Improved gravers / Thomas Gill
In: The technical repository. - Vol. 3 (1823). - P. 356.
§ Information on steel alloyed with rhodium for burins as given by Charles Warren to the editor Thomas Gill, see also: **Warren** (1823) [No. 615].
1 –
Line Engraving
2 –
Steel
NOT SEEN

Gill 2 (Thomas)   460.1

[On burins for engravers] / Thomas Gill.
In: The technical repository. - Vol. 5 [?] (1825), (April).
NOT SEEN
In: *Der Handwerker*, see [No. 460.2].

460.2

Über Grabstichel für Kupferstecher / [Thomas] Gill.
In: Der Handwerker und Künstler Fortschritte und Muster. - Vol. 2 (1827), no. 28. - Col. 76.
1 –
Line Engraving
2 –
Copper
In: NUSG.

Goetz (Henri)   461

Une nouvelle technique de gravure / Henri Goetz.
In: Nouvelles de l'estampe. - (1973), no. 8. - P. 2–5.
§ Dated: 'Henri Goetz le 30 octobre 1972'.
See also: **Goetz** (Paris 1969) [No. 123] and **Rousseau-Leurent** (Villefranche-sur-mer 1991) [No. 276].
1 –
Carborundum Print
In: BNP; KB; RMA.

Gonzalez (Enrique)   462

Barniz para aguafuerte : fabricación de barniz casero para aguafuerte / Enrique Gonzalez.
In: Grabado y edición. - Año I (2006), no. 2 (mayo). - P. 33–35 : [12] ill. of which [8] in colour. - (Proceso técnico).
§ Title means: Etching ground: home-made etching ground
Concerns making a liquid etching ground by dissolving ball ground in a solvent.
1 –
Line Etching
In: Priv.Coll.

Green 1 (Cedric)   463

Intaglio without tears / Cedric Green reassesses old electrolytic plate-making processes.
In: Printmaking today. - Vol. 7 (1998), no. 1 (spring). - P. 25–27 : [3] ill., tab.
§ For a reaction see: **Behr 5** (1998) [No. 385].
See also: **Semenoff** & **Christos 1** (1991) [No. 580].
1 –
Electrolytic Etching
In: Priv.Coll.

Intaglio without tears / [comment by] Cedric Green.
In: Printmaking today. - Vol. 7 (1998), no. 4 (winter). - P. 33.
§ For a reaction see: **Behr** & **Behr 6** (1998) [No. 386].
1 –
Electrolytic Etching
In: Priv.Coll.

Galvanography revisited / Cedric Green.
In: Printmaking today. - Vol. 8 (1999), no. 1 (spring). - P. 32 : [1] fig., [1] tab.
1 –
Electrolitic Etching
In: Priv.Coll.

Galv-etching without electricity / Cedric Green.
In: Printmaking today. - Vol. 11 (2002), no. 2 (summer). - P. 28–29 : [2] ill.
Literature: p. 29.
1 –
Electrolytic Etching
In: Priv.Coll.

Improvements in the process of producing prints or impressions from steel, copper, or other plates / Henry Griffiths.
In: The London journal of arts & sciences; and repertory of patent inventions. - Conjoined series, vol. 16 (1840). - P. 42–44.
§ P. 42: 'Sealed 25th May, 1839.'
P. 44: 'Inrolled in the Rolls Chapel Office, November, 1839.'
Concerns multiple-plate printing with the normal oil-based inks, with a reference to printing with watercolours and a reference to printing with dry pigments before over-printing with inks.
Transcription after digital scan.
3 –
Ink / Multiple-plate Printing / Printing Polychrome
In: *Bridson & Wakeman 1984*: no. B84; TUD; UBA.

H

About etching / [Francis Seymour Haden].
In: Fine arts quarterly review. - Vol. 1, new series (1866). - P. 145–160.
Transcription after microfiche.
1 –
Line Etching
In: KB (microfiche).

Etching for copper-plate printing / [extracted from a lecture by Francis Seymour Haden].
In: The printing times and Lithographer. - New series vol. 8 (1882), (15 Oct.). - P. 247–248.
§ The author is Philip Gilbert Hamerton according to *Bridson & Wakeman*.
1 –
Electrolytic Etching / Line Etching
2 –
Copper / Steel / Steelfacing / Zinc
5 –
Aesthetics
In: *Bridson & Wakeman 1984*: no. B 30; UBA; UBL.

Etching / Philip Gilbert Hamerton
In: The art-journal. - New series, vol. 5 (1866). - P. 293–297.
Supplier: p. 293.
With literature.
See also: **Hamerton** (London 1871), no. 133.
1 –
Drypoint / Line Etching / Soft-ground
2 –

Copper / Steel / Steelfacing / Zinc
3 –
Casting / Press / Rubbing
5 –
Aesthetics / Art History
In: KB.

<div align="right">Hamerton 2 (Philip Gilbert)   471</div>

Recent improvements in the process of etching / P[hilip] G[ilbert] H[amerton].
In: The portfolio. - Vol. 1 (1870). - P. 188–189.
§ Title description after photocopy.
See also: **Hamerton** (London 1871) [No. 133].
1 –
Line Etching
2 –
Copper
In: *Bridson & Wakeman 1984*: no. B23; OCLC; *Poole 1882* (Etching); UBA; UBL.

<div align="right">Hamerton 3 (Philip Gilbert)   472</div>

Technical note. Thin plates for etching / [Philip Gilbert Hamerton].
In: The portfolio. - Vol. 6 (1875). - P. 122.
See also: **Hamerton** (London 1871) [No. 133].
1 –
Line Etching
2 –
Copper
In: *Bridson & Wakeman 1984*: no. B119; OCLC.

<div align="right">Harrison (Arthur)   473</div>

A parallel rule for the use of engravers / [contributing letter by] Arthur Harrison ; drawn by Cornelius Varly ; engr[aved] by G. Gladwin.
In: Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce. - Vol. 38 (1821). - P. 45–46 : pl. 5.
§ Harrison was awarded the 'smaller, or Silver Isis Medal' for his parallel rule (p. 45).
The letter is dated, p. 45: '4, Charlotte Street, Rathbone Place, November 2, 1819'.
1 –
Line Etching
In: *Bridson & Wakeman 1984*: no. B92; TM; UBU.

<div align="right">Harrison (Rex)   474</div>

Photoetching the 'Harrison way' / Rex Harrison.
In: Printmaking today. - Vol. 3 (1994), no. 2 (summer). - P. 26–27.
§ Reaction: **Pengelly** (1994) [No. 545].
1 –
Photomechanical Etching
2 –
Copper / Silver
In: Priv.Coll.

<div align="right">Harrison (Rosalind)   475</div>

Photoshopping for photoetching / Rosalind Harrison.
In: Printmaking today. - Vol. 5 (1996), no. 4 (winter). - P. 30–31.
§ Concerns photopolymer film.
1 –
Photomechanical Etching.
2 –
Plastic
3 –
Printing in Black
In: Priv.Coll.

<div align="right">Hassell (John)   476.1</div>

Improvement in the aquatinta process, by which pen, pencil, and chalk drawings can be imitated / [two contributing letters by] John Hassell.
In: Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce. - Vol. 28 (1811). - P. 97–105.
§ Hassell was awarded the 'Silver Medal and thirty guineas' for his process (p. 97).
The letters are dated, pp. 99 and 104 respectively: '11, Clement's Inn, Strand. March 26, 1810' and 'No. 11, Clement's Inn, May 10, 1810'.
Contains the technique of reproducing drawings as described in: **Hassell 1** (London 1811), p. 97.
Hassell protests against the practical part of another aquatint process comparable to his, p. 103 : 'I did produce specimens of my invention as far back as the year 1795 to the public, since which time I have improved the principle.'
The technique copied, without reference, in **Francis** (1842), vol. 3 (1842), pp. 398–399.
1 –

Crayon Etching / Lift-ground
2 –
Copper
In: *Bridson & Wakeman 1984*: no. B12; TM; UBU.

476.2

Improvement in the aquatinta process, by which pen, pencil, & chalk drawings can be imitated / John Hassell.
In: Journal of natural philosphy, chemistry & the arts. - Vol. 30 (1811). - P. 220–226.
§ Nearly the same article as in the *Transactions*.
The magazine is also known by the name of its editor William Nicholson: Nicholson's Journal.
Hassell says, p. 225: 'I did produce specimens of my invention as far back as the year 1795 to the public.'
In: *Bridson & Wakeman 1984*: no. B12; *Singer & Strang 1897*: no. 91 (separate imprint); TM; UBA; UBU.

476.3

Improvement in the aquatinta process, by which pen, pencil, & chalk drawings can be imitated / John Hassell
In: Technical repository. - (1827), (April).
NOT SEEN
In: *Der Handwerker*: col. 287, see [No. 476.4].

476.4

Feder-, Bleistift- un Kreidezeichnungen in Aquatinta nachzumachen / J[ohn] Hassell.
In: Der Handwerker und Künstler Fortschritte und Muster. - Vol. 2 (1827), no. 41. - Col. 284–287.
Literature: col. 285.
In: NSUG.

Hecht (Joseph)
See: **Hecht** (1994) [No. 139.2].

Henrici (Moritz)   477

Die Stahlstechkunst / [after Moritz Henrici].
In: Journal für Buchdruckerkunst, Schriftgießerei und die verwandten Fächer. - Vol. 1 (1834) no. 6 (1 Dec.). - Col. 116–122.
§ Title means: The art of steel engraving
Summary of **Henrici** (Leipzig 1834) [No. 142], with an emphasis on the mordant for steel; see col. 116.
1 –
Line Etching / Ruling Machine
2 –
Steel
5 –
Art History
In: HAB; SBH; UBA; UBN; UBU.

Hood (R.)   478

Carborundum tint : a new printmaker's process / Richard Hood.
In: Magazine of art. - Vol. 31 (1938), no. 11 (Nov.). - P. 643, 670–671 : [2] reprod.
1 –
Carborundum Print / Mezzotint
2 –
Copper
3 –
Printing in Black
In: RMA.

Hoover (Heather)   479

Toner transfer paper / Heather Hoover.
In: Printmaking today. - Vol. 5 (1996), no. 3 (autumn). - P. 28–30 : [1] ill.
Literature: p. 30.
§ Concerns transferring a laser-printed image onto a printing plate.
1 –
Aquatint / Line Etching
In: Priv.Coll.

Hoskins (Stephen) & **Pearce** (Roy)   480

The chemistry of ferric chloride / Stephen Hoskin and Roy Pearce.
In: Printmaking today. - Vol. 4 (1995), no. 2 (summer). - P. 24–25 : tab.
Literature: p. 25.
§ Addendum: *Printmaking Today*, 4 (1995) 4: 31.
See also: **Kiekeben 1** (1997) [No. 499].
1 –
Line Etching
2 –
Copper
In: Priv.Coll.

Further developments in the Howard Process: halftone image-making with non-glare glass / Keith Howard.
In: Printmaking today. - Vol. 2 (1993), no. 3 (autumn). - P. 22–24 : [7] ill.
Literature: p. 24.
See also: **Howard** (Grande Prairie 1998) [No. 151].
1 –
Photomechanical Etching
In: Priv.Coll.

Paradigm shift / Keith Howard.
In: Printmaking today. - Vol. 3 (1994), no. 1 (spring). - P. 22–23 : [2] ill.
Literature: p. 23.
§ Concerns preparing a photographic printing plate by means of a photosensitive gelatin emulsion, as in photogravure. After lighting and hardening, the plate is not etched, but instead soaked in an acrylic liquid that is absorbed by the gelatin. The gelatin/acrylic layer is printed in intaglio.
See also: **Howard** (Grande Prairie 1998) [No. 151].
1 –
Photomechanical Etching
In: Priv.Coll.

Indirect Howard-type / Keith Howard.
In: Printmaking today. - Vol. 3 (1994), no. 3 (autumn). - P. 21–23 : [1] ill.
Literature: p. 23.
§ Concerns the use of Riston, an earlier type of photopolymer film.
See also: **Howard** (Grande Prairie 1998) [No. 151].
2 - Photopolymer Film
2 –
Copper
In: Priv.Coll.

The Howard-E-type method / Keith Howard.
In: Printmaking today. - Vol. 4 (1995), no. 2 (summer). - P. 20–22 : [7] ill.
§ Concerns the use of Riston, an earlier type of photopolymer film.
See also: **Howard** (Grande Prairie 1998) [No. 151].
2 - Photopolymer Film
In: Priv.Coll.

Peaks and troughs / Rand Huebsch.
In: Printmaking today. - Vol. 12 (2003), no. 4 (winter). - P. 28–29 : [3] ill.
3 –
Blind Embossment
In: Priv.Coll.

A new mode of preparing certain surfaces for being corroded with acids, in order to produce patterns & designs for the purpose of certain kinds of printing & transparencies / Charles J. Hullmandel.
In: London journal of arts and sciences. - Conjoined series 16 (1840). - P. 257–263.
§ *Bridson & Wakeman*: 'Patent specification'. The patent is not in *Woodcroft 1969*.
1 –
Lift-ground
2 –
Copper
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B 15; UBA.

Menstruum for biting-in on plates of soft steel / [contributing letter by] W[illia]m Humphrys.
In: Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce. - Vol. 44 (1826). - P. 53–55.
§ Humphrys was awarded the 'Gold Isis Medal' for his mordant.
 'W. Cooke junior and William Humphrys were each awarded the Gold Isis Medal in 1825 and 1826 for their work on etching fluids concerned with the differing requirements of hard and soft steel'; *Hunnisett 1980*: 48–49.
The articles of Cooke and Humphrys are placed immediately after each other in the *Transactions* and in *The Franklin Journal*, see: **Cooke** (1826) [No. 420].
The letter is dated, p. 53: '65, Charlotte-street, Rathbone-place. April 19, 1826'.
Humphrys also attended the first presentation of steelfacing in England, see: **Joubert 2** (1858) [No. 495]: 20.
1 –

Line Etching
2 –
Steel
In: *Bridson & Wakeman 1984*: no. B98; TM; UBU.

<div align="right">487.2</div>

Menstruum for biting-in on plates of soft steel / W. Humphrys.
In: London journal of arts and sciences. - Vol. 13 (1827). - P. 42–43.
§ The same article as in the *Transactions*.
1 –
Line Etching
2 –
Steel
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B98; UBA.

<div align="right">487.3</div>

On a menstruum for etching plates of soft steel / by W[illiam] Humphrys.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 3 (1827), no. 4 (April). - P. 252–253.
§ The same article as in the 'Transactions', p. 252.
The articles of Cooke and Humphrys are placed immediately after each other in the *Transactions* and in *The Franklin Journal*, see: **Cooke** (William John) [Nos. 420.1 and 420.3].
Title description after photocopy.
In: OCLC; *Poole 1882* (Etching).

<div align="right">487.4</div>

[Mordant for etching steel plates].
In: Journal des connaissances usuelles. - (1834), (March). - P. 155.
NOT SEEN
In: *Polytechnisches Journal*, see [No. 487.5]; TUD.

<div align="right">487.5</div>

Ueber einige Beizen für den Stahlstich.
In: Polytechnisches Journal. - Vol. (1834), no. 52. - P. 319.
§ Contains summaries of the articles by Humphrys and Turrell, see: **Turrell 2** (1824) [No. 605]. The article by **Cooke** (1826) [No. 420] is not referred to.
In: UBA.

<div align="right">**Hunt** (Robert)   488</div>

On the applications of science to the fine and useful arts. The curiosities of steel manufacture. Steel plates for engraving - steel pens / Robert Hunt.
In: The art-journal. - Vol. 12 (1850). - P. 230–232.
1 –
Line Etching
2 –
Steel
5 –
Art History
In: *Bridson & Wakeman 1984*: no. B111; UBA; UBL; UBU.

<div align="center"># I</div>

<div align="right">**Intaglio copper plates** 489</div>

Intaglio copper plates by the etching process.
In: The year-book of photography and photographic news almanac. - London : Piper and Carter, 1888. - P. 171–175 : 3 fig.
With literature.
§ The article is largely compiled from different publications.
Title description after photocopy.
1 –
Aquatint / Line Etching / Photomechanical Etching
2 –
Copper
In: UBA.

<div align="right">**Intaglio printing machine** 490</div>

[Intaglio printing machine].
In: The printing times and Lithographer. - New series, vol. 7 (1881), (15 July). - P. 197.
3 –
Press
In: UBL.

J

Gravure et imprimerie en taille-douce / Charles Jacques [sic!] ; [ill. by Charles Jacque].
In: Le magasin pittoresque. - Vol. 20 (1852). - P. 188–189, 236–237, 292–293, 331–334, 372–374 : 23 fig.
§ Title means: Intaglio engraving and printing
The numbering of the figures is continuous.
1 –
Aquatint / Crayon Engraving / Crayon Etching / Drypoint / Lift-ground / Line Engraving / Line Etching / Mezzotint / Ruling Machine / Soft-ground / Stipple Engraving
2 –
Copper / Steel / Tin / Zinc
3 –
Multiple-plate Printing / Press / Printing à la Poupée / Printing in Black / Printing Polychrome
5 –
Art History
In: UBL-KHI.

Pressenbau. Beschreibung einer neuen vereinten Buchdruk- Steindruck- und Kupferdruck-Presse / von Georg Jöntzen.
In: Journal für Buchdruckerkunst, Schriftgießerei und die verwandte Fächer. - Vol. 3 (1836), no. 4 (1 April). - Kol. 70–77.
§ Title means: Press construction. Description of a new combination press for book, stone and intaglio printing
The article is dated, col. 75: 'Bremen, Im Januar 1836. Georg Jöntzen sen.'
3 –
Press / Printing in Black
4 –
Lithography / Typography
In: SBH; UBA; UBU.

Collagraph meets photograph / Peter Jones.
In: Printmaking today. - Vol. (2002), no. (spring). - P. 23–24 : [6] ill. of which [2] in colour.
1 –
Collagraph
4 –
Screen Printing
In: Priv.Coll.

Steel on copper-plates.
In: The art-journal. - New Series, vol. 4 (1858), (1 Oct.). - P. 319, col. 1.
§ This notice by the editor on steelfacing precedes Joubert's presentation of 26 November 1858; **Joubert 2** (1858) [No. 495].
'A brief notice of the invention has already been given in the Journal of the Society of Arts.' This refers probably to the notice on the first page, first col. (page number not available), of *The Journal of the Society of Arts*, vol 6 (1858), no. 303 (10 Sep.). 'Next month we hope to speak of it at some length'; see: **Joubert 3** (1858) [No. 496].
Introduction of steelfacing of copper plates by Joubert 'a French engraver long settled in this country'.
2 –
Copper / Steelfacing
In: KB.

NB: The following is the text of Joubert's lecture in which he demonstrates the steelfacing process. The ensuing discussion between Henry Bradbury and Joubert, with some other correspondents, is of importance because further technical details were added to the original text. In order to keep this discussion coherent the letters are described in chronological order. Joubert's original text was issued twice afterwards; the title descriptions are given after the letters.

On a method of rendering engraved copper-plates capable of producing a greatly-increased number of impressions / by J[ean] [Ferdinand] Joubert [de la Ferté].
In: The journal of the Society of Arts. - Vol. 7 (1858), no. 314 (26 Nov.). - P. 15–20.
§ The text of the lecture is on pp. 15–18, the following discussion with the audience is on pp. 18–20.
Joubert's lecture was announced in no. 313, Friday 19 November 1858, p. 14: 'Meetings for the ensuing week ... Wed. Society of Arts, 8. Mr. F. Joubert, "On a Method of rendering Engraved Copper-Plates capable of Producing a greatly-increased Number of Impressions".' The lecture was scheduled on Wednesday, 24 November at '8', which is 8 pm as the text of the discussion (p. 18) makes mention about 'the process exhibited that evening'.
Among the audience was William Humphrys, one of the pioneers of etching steel printing plates, see: **Humphrys** (London 1826) [No. 487].

Title description after photocopy and digital scan.
1 –
Electrotype
2 –
Copper / Steelfacing
5 –
Art History
In: BLBS; *Bridson & Wakeman 1984*: no. B113; *Hunnisett 1980*: 198 n. 43; TUD; UBA (digitised); UBN (digitised).

495.2

Electro-zinc deposits on engraved copper-plates / Henry Bradbury.
In: The journal of the Society of Arts. - Vol. 7 (1859) (4 Feb.). - P. 172–173.
§ The letter is dated: 'Whitefriars, Feb. 3, 1859'.
With reference to a 'mentioning' by Louis Figuier in *La Presse* about Bradbury's manner of zincfacing copper plates.
Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

495.3

Electro-zinc deposits on engraved copper plates / [Jean] F[erdinand] Joubert [de la Ferté].
In: The journal of the Society of Arts. - Vol. 7 (1859) (11 Feb.). - P. 189.
§ The letter is dated: 'Porchester-terrace, Feb. 10. 1859'.
Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

495.4

Electro-zinc deposits on engraved copper-plates / Henry W. Reveley
In: The journal of the Society of Arts. - Vol. 7 (1859) (18 Feb.). - P. 203.
§ Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

495.5

Electro-zinc deposits on engraved copper-plates / Henry Bradbury.
In: The journal of the Society of Arts. - Vol. 7 (1859) (25 Feb.). - P. 221.
§ The letter is dated: 'Whitefriars'.
Reference to facing copper plates with gold and silver, and to Bradbury's experiments with nickel, palladium and platinum.
Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

495.6

Electro-zinc deposits on engraved copper-plates / George T. Doo.
In: The journal of the Society of Arts. - Vol. 7 (1859) (4 March). - P. 236.
§ The letter is dated: 'Great Stanmore, March 1st, 1859'.
Question about the gold- and silverplating, not known to this engraver.
Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

495.7

[Electro-zinc deposits on engraved copper-plates] / [Jean] F[erdinand] Joubert [de la Ferté].
In: The journal of the Society of Arts. - Vol. 7 (1859) (4 March). - P. 236–237.
§ The letter is dated: 'Porchester-terrace, March 1st, 1859'.
Joubert's criticism of Bradbury's statements.
Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

495.8

Electro-zinc deposits on engraved copper-plates / Henry Bradbury.
In: The journal of the Society of Arts. - Vol. 7 (1859) (22 July). - P. 601–602.
§ The letter is dated: 'Whitefriars, July 9th, 1859'.
Counters Joubert's criticism.
P. 601: 'extract from my printed Lecture "On the Security and Manufacture of Bank Notes", delivered in May, 1856, at the Royal Institution'. This concerns a reference to metalfacing copper plates.
P. 602: 'This letter has appeared in the *Daily News*.' The *Daily News* was issued by Bradbury & Evans, the firm of Henry Bradbury's father William Bradbury.
Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

495.9

[Electro-zinc deposits on engraved copper-plates] / [Jean] F[erdinand] Joubert [de la Ferté].
In: The journal of the Society of Arts. - Vol. 7 (1859) (22 July). - P. 602.
§ The letter is dated: 'Porchester-terrace, July 12, 1859'.
Further criticism.
Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

495.10

Electro-zinc deposits on engraved copper-plates / Henry Bradbury.
In: The journal of the Society of Arts. - Vol. 7 (1859) (29 July). - P. 612–613.
§ The letter is dated: 'Whitefriars, July 26th, 1859'.
Counters Joubert's criticism and shows that Bradbury is more knowledgeable concerning facing with metals other than iron.

See also: **Bradbury 2** (1860) [No. 398].
Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

<div align="right">495.11</div>

Electro-zinc deposits on engraved copper-plates / F.W. Kirby.
In: The journal of the Society of Arts. - Vol. 7 (1859) (5 Aug.). - P. 625.
§ The letter is dated: 'Aug. 2nd, 1859'.
Corrects Bradbury concerning the costs of metalfacing
Title description after digital scan.
In: *Bridson & Wakeman 1984*: no. B113; TUD; UBA (digitised); UBN (digitised).

<div align="right">495.12</div>

On a method of rendering engraved copper-plates capable of producing a greatly increased number of impressions / [Jean] F[erdinand] Joubert.
In: Photographic news. - Vol. 1 (1858–1859). - P. 147–150.
§ The same article, but without the following letters.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B113.

<div align="right">495.13</div>

[On a method of rendering engraved copper-plates capable of producing a greatly increased number of impressions] / [Jean] F[erdinand] Joubert.
In: Journal of the Photographic Society. - Vol. 6 (1859). - P. 31–36.
§ The same article, but without the following letters.
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B113.

<div align="right">**Joubert 3** (Jean Ferdinand)   496</div>

A process of hardening engraved copper plates.
In: The art-journal. - New series, vol. 4 (1858), (Dec.). - P. 356.
§ The text is by the editor of *The Art-Journal*, summarising and quoting Joubert's patent.
2 –
Copper / Steelfacing
In: KB.

K

<div align="right">**Kästner** (…)497.1</div>

[About softening and hardening steel printing plates] / […] Kästner.
In: Gewerbeblatt für Sachsen. - (1841), no. 30.
NOT SEEN
In: *Polytechnisches Journal*, see [No. 497.2].

<div align="right">497.2</div>

Ueber die Vorbereitung des Stahls zum Stahlstechen / […] Kästner.
In: Polytechnisches Journal. - Vol. 22 (1841), no. 81. - P. 317.
§ Title means: On the preparation of the steel [plate] for steel engraving
1 –
Line Engraving
2 –
Steel
In: UBA.

<div align="right">**Karmarsch** (Karl)   498.1</div>

[On a mordant for steel printing plates] / Karl Karmarsch.
In: Mitteilungen des Gewerbe-Vereins für das Königreich Hannover. - No. 9 (1837[?]).
1 –
Line Etching
2 –
Steel
NOT SEEN
In: *Journal für Buchdruckerkunst*, see [No. 498.2].

<div align="right">498.2</div>

Aezwasser für Stahl / [Karl] Karmarsch.
In: Journal für Buchdruckerkunst (etc.). - Vol. 4 (1837), no. 5 (31 May). - Col. 77.
§ Title means: Etching water for steel
1 –
Line Etching
2 –
Steel
In: SBH; UBA; UBN; UBU.

The Edinburgh Etch: a breakthrough in non-toxic mordants / Friedhard Kiekeben.
In: Printmaking today. - Vol. 6 (1997), no. 3 (autumn). - P. 26–27 : [1] ill.
§ Concerns an adaptation of etching with ferric chloride, see also: **Hoskins & Pearce** (1995) [No. 480].
1 –
Line Etching
2 –
Copper / Zinc
5 –
Health and Safety
In: Priv.Coll.

Perfect chemistry / Friedhard Kiekeben.
In: Printmaking today. - Vol. 13 (2004), no. 2 (summer). - P. 22–23 : [5] ill. in colour.
1 –
Line Etching
2 –
Steel
5 –
Health and Safety
In: Priv.Coll.

Specification of the patent granted to Robert Kirkwood, of Edinburgh, engraver, and copper-plate printer; for certain improvements on the copper-plate printing-press / Robert Kirkwood.
In: Repertory of arts, manufactures and agriculture. - Vol. 3, second series (1803). - P. 245–248 : pl. X.
§ P. 245: 'Dated February 28, 1803'.
English patent: A.D. 1803, February 28.–№ 2863 (four). See also the improvements by Perkins; **Perkins** (1811) [No. 546].
Title description after photocopy.
3 –
Press
In: BLBS; *Bridson & Wakeman 1984*: no. B890; *Woodcroft 1969*: 108.

L

Account of a method of printing mezzotinto prints in colours / [contributing letter by] Robert Laurie.
In: Transactions of the Society for the Encouragement of Arts, Manufacture and Commerce. - Vol. 2 (1784). - P. 145–148.
§ The letter is dated, p. 147: 'Nov. 6, 1776, No. 53, Fleet Street'. The Explanation is dated, p. 148: 'Nov. 21, 1776'.
This volume was reprinted in 1789 and around 1800.
Not instructive.
Laurie's text is copied in: **Compendium** (London 1797) [No. 067]: 201–202.
1 –
Mezzotint
2 –
Copper
3 –
Printing à la Poupée / Printing Polychrome
In: *Bridson & Wakeman 1984*: no. B83; TM; UBU.

Multiplate color aquatint etching / Hank Laventhol.
In: Journal of the print world. - Vol. 5 (1982), no. 1 (winter). - P. 18–19 : ill.
1 –
Aquatint
2 –
Copper / Steelfacing
3 –
Multiple-plate Printing / Printing Polychrome
In: Priv.Coll.

Aezgrund für Kupferstecher / [...] Lawrence.
In: Polytechnisches Journal. - Vol. 24 (1843), no. 87. - P. 394.

§ Title means: Etching ground for engravers

The recipe is copied from one of the editions of the German translation of Ure's dictionary (1st ed.: London 1839): Technisches Wörterbuch / übers. von Karl Karmarsch, Friedrich Heeren. - [1st ed.]. - Prag : Haase, 1843–1844. See also: **Etching ground recipe** (1850) [No. 439].

This first edition or a later edition: vol. 1, p. 77.

The recipe by Lawrence is also given in **Roller** (Wien 1888): [No. 270.1] 31, and in **Villon** (Paris, 2nd ed., 1914) [No. 349.2]: 83–84, with minor differences.

1 –

Line Etching

2 –

Copper

In: UBA.

Le Blon (Jacque Christoph)   505.1

Lettre de M. J[acque] C[hristoph] Le Blon, écrite de Paris le 18. Août 1738. au sujet des estampes colorées.

In: Mercure de France. - (1738), (Aug.). - P. 1802–1804.

§ Title means: Letter by Jacque Christoph Le Blon, written from Paris on 18 August 1738, concerning the subject of colour prints

The contributing letter is dated, p. 1802: 'Paris, le 18. Août 1738'.

Title description after photocopy.

See also: **Le Blon** (London 1725) [No. 180].

1 –

Mezzotint

3 –

Multiple-plate Printing / Printing Polychrome

In: HAB; **Le Blon** (Stuttgart 1985) [No. 180.7]: 69–71, 143–144; *Rodari 1996*: 62; UBA.

505.2

Lettre de M. J[acque] C[hristophe] Le Blon, écrite de Paris le 18. Août 1738. au sujet des estampes colorées.

In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 35 (July–Dec. 1969). - P. 94.

In: KB.

Le Prince 1 (Jean Baptiste; 1769)   506.1

Gravure au lavis [invention de Jean Baptiste Le Prince] / […] des Boulmiers.

In: Mercure de France. - (1769), (Nov.). - P. 166–168. - (Arts. Gravure ; I).

§ Title means: Tonal engraving (invention by de Jean Baptiste Le Prince)

Shorter version of the prospectus Le Prince issued on 10 July 1780, see: **Le Prince** (Paris 1780) [No. 182.2].

Title description after photocopy.

1 –

Aquatint

5 –

Original and Reproduction

In: *Deville 1973*: 103 (Gravure au lavis).

506.2

Gravure au lavis [invention de Jean Baptiste Le Prince] / […] des Boulmiers.

In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 97 (July–Dec. 1769; 1971). - P. 381–382.

In: KB.

Le Prince 2 (Jean Baptiste; 1771)   507.1

[On the works by Le Prince reproducing washed drawings].

In: Mercure de France. - (1771), (May). - P. 197–198. - (Arts. Gravure ; II).

§ See also: **Le Prince** (Paris 1780) [No. 182.2].

Title description after photocopy.

1 –

Aquatint

5 –

Original and Reproduction

In: *Deville 1973*: 103 (Gravure).

507.2

[On the works by Le Prince reproducing washed drawings].

In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 100 (Jan.–June 1771; 1971). - P. 383.

In: KB.

Le Prince 3 (Jean Baptiste; 1780)   508.1

Découverte d'un procédé de gravure en lavis, par M. [Jean Baptiste] Le Prince.

In: Mercure de France. - (1780), (Aug.). - P. 91–94. - (Sciences et arts).

§ Title means: Discovery of a tonal engraving process, by M. [Jean Baptiste] Le Prince

The text of the prospectus Le Prince issued on 10 July 1780, see: **Le Prince** (Paris 1780) [No. 182.2].

Title description after photocopy.

1 –

Aquatint

3 –

Ink / Printing in Black / Printing Monochrome

5 –
Original and Reproduction
In: *Deville 1973*: 103 (Gravure au lavis).

508.2

Découverte d'un procédé de gravure en lavis, par M. [Jean Baptiste] Le Prince.
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 119 (July–Dec. 1780; 1974). - P. 163–164.
In: KB.

Linck (J.F.) 509

Verbessertes Verfahren bei Anfertigung der Gegendrucke von Kupferstichen / J.F. Linck.
In: Archiv für die zeichnenden Künste : mit besondere Beziehung auf Kupferstecher- und Holzschneidekunst und ihre Geschichte. - Vol. 5 (1859). - P. 196–198.
§ Title means: Improved manner of making counterproofs of engravings
The magazine is also known by the name of its editor Robert Nauman: Naumans Archiv.
3 –
Counterproof
In: UBL-KHI.

Longhi (Giuseppe) 510.1

Descrizione del tavolino mobile, utilissimo agli intagliatori di bulino in rame / immaginato e fatto eseguire dal Giuseppe Longhi di Monza.
In: Atti della Societa patriotica di Milano diretta all'avanzamento dell'agricoltura e delle arti. - Vol. 3 (1793). - P. 372–375 : Tav. 10.
§ Title means: Description of the turn-table, very useful for the copper engraver
Title description after photocopy.
See also: **Longhi** (Milano 1830) [No. 189].
1 –
Line Engraving
2 –
Copper
5 –
Health and Safety
In: **Perrot** (Ilmenau 1831) [No. 234.4]: 62 n.; NSUG.

510.2

[Concerning Longhi's turn-table].
In: Repertory of arts and manufactures. - No. 29 ([c. 1798?]).
§ The Repertory was issued under this title from 1794–1802.
NOT SEEN
In: *Oeconomische Courant*, see [No. 510.3].

510.3

Beschreibung und Geschichte der neuesten und vorzüglichsten Instrumente und Kunstwerke für Liebhaber und Künstler in Rücksicht ihrer mechanischen Anwendung : nebst denen dahin einschlagenden Hülfswissenschaften / Johann Gottlieb Geißler. - Zittau : Schöps, 1792–1802. - 12 vol.
§ Longhi's turn-table is in vol. 9 (1798).
Second edition: vol. 1 (1798 or 1811) only.
NOT SEEN
In: BL; KVK.

510.4

[Plaatsnyders-Tafel] / [Giuseppe Longhi].
In: Oeconomische Courant. - Vol. 2 (1800), no. 113 (5 March). - P. 70. - (Nieuwe uitvindingen).
In: KB.

López Alonso (Francisco) 511

Estudio del aluminio como matriz de grabado / Francisco López Alonso.
In: Grabado y edición. - Año I (2006), no. 5 (nov.). - P. 40–46 : [10] ill. of which [3] in colour. - (Proceso técnico).
§ Title means: A study of aluminium as engraving plate
2 –
Aluminium / Copper / Zinc
3 –
Ink
In: Priv.Coll.

Loudon (Irvine) 512

Salt aquatint / Irvine Loudon.
In: Printmaking today. - Vol. 7 (1998), no. 1 (spring). - P. 28.
1 –
Aquatint
In: Priv.Coll.

Lupton (Thomas Goff) 513

Engraving in mezzotinto on steel / Thomas G[off] Lupton.

In: Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce. - Vol. 40 (1823). - P. 41–43.
§ The letter is dated, p. 41: '7, Leigh-street, Burton-Crescent. November 1st 1822'.
Lupton was awarded the 'Gold Isis Medal' for his mezzotint process.
1 –
Line Etching / Mezzotint
2 –
Steel
In: *Bridson & Wakeman 1984*: no. B94; *Hunnisett 1980*: 42 n. 21, 52 n. 47; TM; UBU.

M

Marais (Mathieu)   514

[Comment on Jacque Christoph Le Blon' colour printing process] / Mathieu Marais.
In: Journal de Mathieu Marais. - (1721), (29 April).
§ The author doubts whether Le Blon's process is commercially feasible because his reproductions after paintings are so expensive.
3 –
Multiple-plate Printing / Printing Polychrome
NOT SEEN
In: *Rodari 1996*: 57.

Martinez García (Óscar) & **Rosa Pastor Cubillo** (Blanca)   515.1

El cuero como soporte para grabado (I) / Óscar Martinez García, Blanca Rosa Pastor Cubillo.
In: Grabado y edición. - Año II (2007), no. 9 (julio). - P. 46–51 : [1], 5 fig. in colour. - (Proceso técnico).
§ Title means: Leather as support for prints
3 –
Leather
4 –
Woodcut
In: Priv.Coll.

515.2

El cuero como soporte para grabado (II) : la estampación calcográfica / Óscar Martinez García, Blanca Rosa Pastor Cubillo.
In: Grabado y edición. - Año II (2007), no. 11 (nov.). - P. 48–53 : 5 fig. in colour. - (Proceso técnico).
§ Title means: Leather as support for prints
1 –
Aquatint / Drypoint / Line Etching
3 –
Leather
In: Priv.Coll.

Meidinger (H.)   516

On the coating of engraved copper plates with iron by the galvanoplastic process / by H. Meidinger.
In: Journal of the Photographic Society of London. - Vol. 6 (1859). - P. 36–37.
Title description after photocopy.
2 –
Copper / Steelfacing
In: BLBS; *Bridson & Wakeman 1984*: no. B114.

Menpes 1 (Mortimer)   517

On the printing of etchings / by Mortimer Menpes.
In: The magazine of art. - Vol. 12 (1889). - P. 328–331 : [1] ill.
§ The magazine is also known after its editor Cassell: Cassell's magazine of art.
The page numbers given by *Bridson & Wakeman* and *Poole* differ from the copies I consulted : pp. 328–333 (B&W), p. 378 (Poole).
Title description after photocopy.
3 –
Ink / Paper / Printing in Black
5 –
Aesthetics
In: *Bridson & Wakeman 1984*: no. B73; *Poole 1897* (Etching); RAA; UBA; UBL.

Menpes 2 (Mortimer)   518

The art of dry-point / Mortimer Menpes.
In: The magazine of art. - Vol. 13 (1890). - P. 78–82 : [5] ill.
§ The magazine is also named after the publisher 'Cassell's magazine of art'.
1 –
Drypoint
2 –

Printing in Black
In: CCP; KB; NCC; *Poole 1897* (Etching); RAA; RMA; UBA; UBL; UBU.

Method   519.1

[A method for taking an impression from a copper-plate on plaster of Paris, with ink, as in common prints.]
In: London Mechanics' Magazine. - (1828[?]).
NOT SEEN
In: *The Franklin Journal*, see [No. 519.2].

519.2

A method for taking an impression from a copper-plate on plaster of Paris, with ink, as in common prints.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 5 (1828), no. 3 (March). - P. 207–208.
Title description after photocopy.
3 –
Casting / Printing in Black
In: RCE (microfilm).

Molard (C.P.)   520

Objets présenté au Conseil [par M. Molard].
Bulletin de la Société d'encouragement pour l'industrie nationale. - (1811). - P. 109–110.
§ Title means: Objects presented to the council (by M. Molard)
This is not an instructive text, but concerns the presentation of steel engraved intaglio printing plates.
For an impression of an engraved steel plate by Molard see: **Perkins 4** (1821) [No. 549].
Title description after photocopy.
1 –
Line Engraving
2 –
Steel
In: *Hammann 1857*: 234.

Montdorge 1 (Antoine Gauthier de)   521.1

Réponse de M. [Antoine Gauthier] de Montdorge, aux informations de M. Rémond de Sainte Albine, au sujet de la contestation entre deux élèves de feu M. le Blond, sur l'art d'imprimer les tableaux.
In: Mercure de France. - (1749), (July). - P. 173–179.
§ Title means: Answer of M. Antoine Gauthier de Montdorge, with information by M. Rémond de Sainte Albine, concerning the dispute between two apprentices of the late M. le Blond, about the art of printing paintings
Comment on: **Gautier-Dagoty 1** (1749) [No. 452].
This contributing letter is dated, p. 179: 'A Paris, le 20 Juin 1749'.
Pp. 175–176 is an excerpt of the report compiled by Montdorge after his visit to Le Blon's workshop in 1738. This excerpt is almost literally the same as **Le Blon** (Paris 1756) [No. 180.2]: 105–111.
3 –
Multiple-plate Printing / Printing à la Poupée / Printing Polychrome
In: *Deville 1973*: 103 (Gravure en couleurs); HAB; **Le Blon** (Stuttgart 1985) [No. 180.7]: 120, 146; *Rodari 1996*: 128, 146–147; UBF.

521.2

Réponse de M. [Antoine Gauthier] de Montdorge, aux informations de M. Rémond de Sainte Albine, au sujet de la contestation entre deux élèves de feu M. le Blond, sur l'art d'imprimer les tableaux.
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 57 (July–Dec. 1749; 1970). - P. 49–51.
In: KB.

Montdorge 2 (Antoine Gauthier de)   522.1

Lettre sur la gravure en couleurs / [Antoine Gauthier de Montdorge].
In: Mercure de France. - (1755), (Dec.), 1st vol. - P. 206–209. - (Arts agréables. Peinture).
§ Title means: Letter about engraving in colours
For Gautier's comment see: **Gautier-Dagoty 4** (1756) [No. 455]. See also: **Robert 3** (1756) [No. 568].
3 –
Multiple-plate Printing / Printing Polychrome
In: *Deville 1973*: 103 (Gravure en couleurs); HAB; *Rodari 1996*: 128.

522.2

Lettre sur la gravure en couleurs / [Antoine Gauthier de Montdorge].
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 69 (July–Dec. 1755; 1970). - P. 362–363.
In: KB.

Montdorge 3 (Antoine Gauthier de)   523.1

Lettre à Gautier [Dagoty sur l'impression des tableaux] / [Antoine Gauthier de Montdorge].
In: Mercure de France. - (1756), (March). - P. 198–213. - (Peinture).
§ Title means: Letter to Gautier (Dagoty on the printing of paintings)
Letter to Gautier (Dagoty on the printing of paintings).
Gautier's answer, dated 15 April 1756, was not published until the nineteenth century, see: **Gautier-Dagoty 5** (1865) [No. 456].
3 –

Multiple-plate printing / Printing Polychrome
In: *Deville 1973*: 103 (Gravure en couleurs); HAB; *Rodari 1996*: 128, 147.

Lettre à Gautier [Dagoty sur l'impression des tableaux] / [Antoine Gauthier de Montdorge].
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 70 (Jan.–June 1756; 1970). - P. 235–238.
In: KB.

El grabado no tóxico : bases acrílicas, mordientes salinos, film fotopolímero y tintas de base al agua / Paco Mora Peral.
In: Grabado y edición. - Año I (2006), no. 4 (sep.). - P. 26–33 : [14] ill. in colour. - (Proceso técnico).
§ Title means: Non-toxic engraving: acylic grounds, saline mordants, photopolymer film and water-based inks
1 –
Line Etching
2 –
Copper / Plastic / Photopolymer Film / Wood / Zinc
3 –
Ink
5 –
Health and Safety
In: Priv.Coll.

El grabado no tóxico : bases acrílicas, mordientes salinos y tintas de base al agua / Paco Mora Peral.
In: Grabado y edición. - Año II (2007), no. 6 (enero). - P. 48–53 : [11] ill. in colour. - (Proceso técnico).
§ Title means: Non-toxic engraving: acylic grounds, saline mordants and water-based inks
1 –
Aquatint
2 –
Aluminium / Copper / Steel / Zinc
5 –
Health and Safety
In: Priv.Coll.

An account of Mr. James Christopher Le Blon's principles of printing, in imitation of painting, and of weaving tapestry, in the same manner as brocades / by Cromwell Mortimer.
In: Philosophical transactions. - Vol. 57 [= 37] (1731–1732), no. 419 (June–July 1731). - P. 101–107.
MIP: pp. 101–103.
§ Le Blon's privilege is in *Woodcroft 1969*: 84–85: 'A.D. 1719, February 5.–№ 423'.
Concerns Le Blon's activities in colour printing.
1 –
Line Engraving / Mezzotint
3 –
Multiple-plate Printing / Printing Polychrome
In: UBU.

The Philosophical Transactions (from the year 1720, to the year 1732) / abridged, and disposed under general heads by [Andr.] Reid and John Gray. - Repr. - London : [Royal Society], 1733. - 6 vol. in 7 bd.
Vol. 6, part 4: Mr. J. Ch. Le Blon's principles of printing, in imitation of painting, and of weaving tapestry, in the same manner as brocades / by Cromwell Mortimer. - P. 30–33.
In: UBU.

Jacob Christoph Le Blon 1667–1741 : inventor of three- and four colour printing / Otto M[agnus] Lilien. - Stuttgart : Hiersemann, 1985. - 223, [5] p. : 57, [9] reprod., of which [16] in colour ; 24.5 cm. - (Bibliothek des Buchwesens ; 9).
Contents: p. 5.
Mortimer's text: pp. 50–57.
List of copies of Coloritto: p. 112.
List of sources: p. 137.
Literature: p. 147.
List of illustrations: p. 154.
Index: p. 157.
Advertisement: p. [4].
MIP: pp. 178–223, [1–2] : VIIII Fig.
ISBN 3-7772-8507-2 (hardcover)
§ Photomechanichal reprint of: London 1731 [No. 526.1]: 50–57.
Review: J. Gage, 'Jacob Christoph Le Blon', in *Print Quarterly*, 3 (1986) 1 (March): 65–67.
In: BL 3; ULC; DBF; DBI-VK; DBL; GBR; HAB; KB; MBvB; NCC; NSUG; OCLC; PBM; Priv.Coll. (2×); RMA; SAB; UBA (2×); UBG; UBH; UBL; UBN; UBU.

Grained glass : an alternative to lithography / Pauline Muir.
In: *Printmaking today*. - Vol. 8 (1999), no. 4 (winter). - P. 28–29 : [2] ill.

§ Concerns using solarplate.
See also: **Welden** & **Muir** (New York 2001) [No. 351].
2 - Photopolymer Plate
In: Priv.Coll.

N

Perfect registration / Indrani Nayar-Gall.
In: Printmaking today. - Vol. 15 (2006), no. 2 (summer). - P. 22–23 : 7 fig.
Literature: p. 23.
1 –
Photomechanical Etching
3 –
Multiple-plate Printing
In: Priv.Coll.

Neue technische Erscheinungen.
In: Archiv für die zeichnenden Künste : mit besonderer Beziehung auf Kupferstecher- und Holzschneidekunst und ihre Geschichte. - Vol. 6 (1860). -
P. 228–229.
Steelfacer: p. 228.
§ Title means: New technical publications
2 –
Steelfacing
In: UBL.

Chemical reactions [letter to the editor] / Carla Neis.
In: Printmaking today. - Vol. 12 (2003), no. 4 (winter). - P. 4.
§ Discusses solarplate printmaking
2 - Photopolymer Plate
5 –
Health and Safety
In: Priv.Coll.

New applications of electricity.
In: The art-journal. - New series, vol. 6 (1860). - P. 95.
2 –
Copper / Steelfacing
In: KB.

New carborundum print developments.
In: Magazine of art. - Vol. 33 (1940), no. 7 (July). - P. 438–439.
1 –
Carborundum Print / Mezzotint / Relief Etching
2 –
Copper
3 –
Multiple-plate Printing / Printing Polychrome / Relief Printing
In: *Art Index* 4 (1938–1941): 246; RMA.

A new method of etching.
In: The art-journal. - Vol. 11 (1849). - P. 162.
§ Discusses the mordant that was later called 'Dutch Bath' or 'Dutch Mordant'. For the original see: **Schwarz** (H.) & **Böhme** (Rud.) [No. 576].
1 –
Line Etching
2 –
Copper / Steel
In: UBU.

New print process : carborundum tint process.

In: Art digest. - Vol. 13 (1938), (Oct.). - P. 24–25.
1 –
Mezzotint
NOT SEEN
In: *Art Index* 4 (1938–1941): 246.

Newbolt (Frank)   535

The art of printing etchings / Frank Newbolt.
In: The studio. - (1906), (Nov.). - P. 134–140 : [8] fig.
3 –
Printing in Black
In: KB.

Nicholson (W.)   536

Description of a new instrument for drawing equidistant & other parallel lines with great accuracy & expedition; intended principally for the use of engravers / W. Nicholson.
In: Journal of natural philosophy, chemistry and the arts. - Vol. 2 (1799[?]). - P. 429–432 : 1 pl.
1 –
Line Etching
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B88; TM; UBA; UBU.

Nieuw zwartsel   537

Nieuw zwartsel voor de boek- en plaatdrukkery.
In: Oeconomische courant. - Vol. 1 (1799), no. 85 (27 Nov.). - P. 260.
Supplier: p. 260.
§ Title means: New blacking for book and plate printing
3 –
Ink
In: KB.

Notice   538

Notice sur un nouveau moyen de préserver de la rouille tous les ustensiles de fer et d'acier.
In: Annales de l'industrie nationale et étrangère, ou mercure technologique; receuil de mémoires sur les arts, et métiers, les manufactures, le commerce, l'industrie, l'agriculture, etc. renfermant la description des musées des produits de l'industrie française. - Vol. 6 (1822). - P. 298–299.
§ Title means: Notice about a new manner of preserving the rusting of iron and steel utensils
P. 298 mentions this is an excerpt of the 'Journal of the Royal Institution'. This journal was only published in the years 1831–1832, however, so probably another journal was meant.
1 –
Line Engraving
2 –
Steel
In: KB.

Nouveau procédé de gravure sur acier   539

Nouveau procédé de gravure sur acier.
In: Annales de l'industrie nationale et étrangère, ou mercure technologique; receuil de mémoires sur les arts, et métiers, les manufactures, le commerce, l'industrie, l'agriculture, etc. renfermant la description des musées des produits de l'industrie française. - Vol. 2 (1821). - P. 89–94.
§ Title means: New process of engraving in steel
1 –
Line Engraving
3 –
Press
In: KB.

P

Palmer (William)   540.1

Improved slide to the ruling machine used by engravers / W[illiam] Palmer.
In: Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce. - Vol. 44 (1826). - P. 44–47 : fig. 1–2.
1 –
Ruling Machine
In: UBU.

540.2

Beschreibung eines verbesserten Schiebers an der Liniirmaschine der Kupferstecher / von W[illiam] Palmer.
In: Handwerker und Künstler. - Jrg. 2 (1827), Nr. 36 (Mai). - Kol. 196–198 : Abb.

In: TIB.

El sistema CAD CAM, aplicado a la producción de obra gráfica / Juan Pardo Rabadán.
In: Grabado y edición. - Año II (2007), no. 7 (marzo). - P. 48–53 : [9] ill. of which [8] in colour. - (Proceso técnico).
§ Title means: The CAD CAM system applied to printmaking
1 –
Ruling Machine
2 –
Brass / Bronze / Copper / Plastic / Wood / Zinc
4 –
Digital Printmaking
In: Priv.Coll.

NB: The following texts are taken from: **Partington** (London 1825) [No. 231]. In case parts are left out this is mentioned in the annotation.

542.1

On engraving / Charles Frederick Partington.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 1 (1826), no. 6 (June). - P. 327–331.
§ This text is taken from: **Partington** (London 1825) [No. 231]: 97–102.
Title description after microfilm.
1 –
Line Engraving
2 –
Copper
5 –
Art History
In: *Poole 1882* (Engraving).

542.2

On engraving / Charles Frederick Partington.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 2 (1826), no. 1 (July). - P. 8–12 : [1] ill.
§ Taken from: **Partington** (London 1825) [No. 231]: 102–107 : [1] ill.
Title description after microfilm.
1 –
Line Engraving
2 –
Copper
5 –
Aesthetics
In: *Poole 1882* (Engraving).

542.3

On engraving. On etching / C[harles] F[rederick] Partington.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 2 (1826), no. 2 (Aug.). - P. 65–69 : [1] ill.
Specimen: pp. 106–108.
§ Taken from: **Partington** (London 1825) [No. 231]: 107–112.
Title description after microfilm.
1 –
Line Etching
2 –
Copper
In: OCLC; *Poole 1882* (Etching).

542.4

On engraving. On machine ruling, and engraving in chalk / Charles Frederick Partington.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 2 (1826), no. 3 (Sep.). - P. 162–165.
§ Taken from: **Partington** (London 1825) [No. 231]: 112–115.
Title description after microfilm.
1 –
Crayon Engraving / Crayon Etching / Ruling Machine
2 –
Copper
3 –
Hand-colouring / Multiple-plate Printing / Printing Polychrome
In: RCE (microfilm).

542.5

On engraving. Engraving in mezzotinto / Charles Frederick Partington.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 2 (1826),

no. 4 (Oct.). - P. 201–204.
§ Taken from: **Partington** (London 1825) [No. 231]: 115–119.
Title description after microfilm.
1 –
Mezzotint
2 –
Copper
3 –
Multiple-plate Printing / Printing à la Poupée / Printing Polychrome
In: OCLC; *Poole 1882* (Engraving).

542.6

On engraving. On aqua tinta / by C[harles] F[rederick] Partington.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 2 (1826),
no. 5 (Nov.). - P. 310–312
§ Taken from: **Partington** (London 1825) [No. 231]: 119–122.
Title description after microfilm.
1 –
Aquatint / Lift-ground
2 –
Copper
In: OCLC; *Poole 1882* (Engraving).

542.7

On engraving. On aqua tinta / by C[harles] F[rederick] Partington.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 2 (1826),
no. 6 (Dec.). - P. 336–338.
§ Taken from: **Partington** (London 1825) [No. 231]: 122–124.
At the bottom of p. 337 it says 'Vol. II.–No. 5.–November', which should be 'Vol. II.–No. 6.–December'.
Title description after microfilm.
1 –
Aquatint
2 –
Copper
5 –
Aesthetics
In: OCLC; *Poole 1882* (Engraving).

542.8

On engraving. On engraving upon wood, and on glass / C.F. Partington.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 3 (1827),
no. 1 (Jan.). - P. 15–19.
§ Taken from: **Partington** (London 1825) [No. 231]: 132–137.
Title description after microfilm.
1 –
Line Etching
2 –
Glass
4 –
Wood Engraving
5 –
Art History
In: RCE (microfilm).

Paton (Hugh)   543

Etching, drypoint, mezzotint / by Hugh Paton.
In: British Lithographer. - Vol. 2 (1892–1893). - P. 13–15, 49–51, 91–94, 120–123, 169–172, 201–203. Vol. 3 (1893–1894). - P. 13–15, 41–43, 89–92,
116–119, 145–148, 177–180.
§ This series of articles was later published as a monograph manual; **Paton** (London 1895) [No. 232], p. iv: 'Since the paper orginally appeared, the
whole of the text has been revised and largely added to, and all the plates re-executed.' Here follow the various articles with their details.

543.1

Introductory / by Hugh Paton.
In: British Lithographer. - Vol. 2 (1892–1893). - P. 13–15
5 –
Art History
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

543.2

Etching / by Hugh Paton.
In: British Lithographer. - Vol. 2 (1892–1893). - P. 49–51 : pl. I–II
Literature: p. 49.
Suppliers: p. 49.
1 –
Line Etching

2 –
Copper
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

<div align="right">543.3</div>

Etching / by Hugh Paton.
In: British Lithographer. - Vol. 2 (1892–1893). - P. 91–94
1 –
Line Etching
2 –
Copper
5 –
Aesthetics
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

<div align="right">543.4</div>

Etching / by Hugh Paton.
In: British Lithographer. - Vol. 2 (1892–1893). - P. 120–123 : pl. III
1 –
Line Etching
2 –
Copper
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

<div align="right">543.5</div>

Etching / by Hugh Paton ; [plate by S.L. Wenban].
In: British Lithographer. - Vol. 2 (1892–1893). - P. 169–172 : [1] pl.
1 –
Line Etching
2 –
Copper / Zinc
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

<div align="right">543.6</div>

Drypoint / by Hugh Paton.
In: British Lithographer. - Vol. 2 (1892–1893). - P. 201–203 : [1?] pl.
1 –
Drypoint
2 –
Copper
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

<div align="right">543.7</div>

Mezzotint / by Hugh Paton.
In: British Lithographer. - Vol. 3 (1893–1894). - P. 13–15 : [2] pl.
1 –
Aquatint / Mezzotint
2 –
Copper
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

<div align="right">543.8</div>

Mezzotint / by Hugh Paton.
In: British Lithographer. - Vol. 3 (1893–1894). - P. 41–43 : [1] pl.
Suppliers: p. 42.
Addresses for rocking mezzotint plates: p. 43.
1 –
Aquatint / Soft-ground
2 –
Copper
3 –
Ink / Paper / Printing in Black
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

<div align="right">543.9</div>

Printing / by Hugh Paton.
In: British Lithographer. - Vol. 3 (1893–1894). - P. 89–92 : [1] pl.
3 –
Printing in Black
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

<div align="right">543.10</div>

Part II. The mordant / by Hugh Paton.
In: British Lithographer. - Vol. 3 (1893–1894). - P. 116–119 : [1] pl.
1 –
Line Etching
2 –
Copper

4 –
Monotype
5 –
Aesthetics / Health and Safety
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

543.11

Part II. The ground / by Hugh Paton.
In: British Lithographer. - Vol. 3 (1893–1894). - P. 145–148 : [1] pl.
Supplier: p. 147.
1 –
Line Etching
2 –
Copper / Steel / Steelfacing / Zinc
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

543.12

Part II. Tools / by Hugh Paton.
In: British Lithographer. - Vol. 3 (1893–1894). - P. 177–180 : [1] ill.
Supplier: pp. 178, 179.
1 –
Line Etching
3 –
Press / Printing in Black
In: BLBS; *Bridson & Wakeman 1984*: no. B38.

Pearce (Roy)
See: **Hoskins** (Stephen) & **Pearce** (Roy) [No. 480].

Pengelly 1 (Jon)   544

Vertical etching tank / Jon Pengelly.
In: Printmaking today. - Vol. 3 (1994), no. 3 (autumn). - P. 24 : [3] ill.
1 –
Line Etching
In: Priv.Coll.

Pengelly 2 (Jon)   545

A water-based screenprinted indirect photo etching technique / Jon Pengelly.
In: Printmaking today. - Vol. 3 (1994), no. 4 (winter). - P. 27.
§ With reference to: **Harrison** (Rex; 1994) [No. 474].
1 –
Photomechanical Etching
In: Priv.Coll.

Penketh (Paul)
See: **Ward** (Nicholas) [No. 614].

Perkins 1 (Jacob)   546.1

Specification of the patent … for certain improvements in the construction and method of using plates and presses, and for combining various species of work in the same plate, for the kind of printing usually called copper plate printing, designed for the objects of detecting counterfeits, for multiplying impression, and saving labour / granted to Joseph C. Dyer, communicated to him by a Foreigner residing abroad [= Jacob Perkins].
In: Repertory of arts, manufactures and agriculture. - Vol. 19, second series (1811), no. 113 (Oct.). - P. 257–267 : pl. XIV.
§ English patent: A.D. 1810, October 1.–№ 3385.
Contains also improvements of the press with the D-shape roller, see: **Kirkwood** (1803) [No. 501].
Title description after photocopy.
1 –
Line Engraving / Ruling Machine
2 –
Steel
3 –
Press / Printing in Black
In: KB; *Woodcroft 1969*: 122–123.

546.2

Certain improvements in the construction and method of using plates and presses and for combining various species of work in the same plate, for the kind of printing usually called copper-plate printing, designed for the object of detecting counterfeits, for multiplying impression, and saving labour / Joseph C. Dyer.
In: Rolls chapel reports. - 8th report (1810 [?]). - P. 82.
NOT SEEN
In: *Woodcroft 1969*: 122–123.

Certain machinery and implements applicable to the transferring of engraved or other work from the surface of one piece of metal to another piece of metal; and to the forming of metallic dies and matrices. And also improvements in the construction and method of using plates and presses for printing bank notes and other papers, whereby the producing and combining various species of work is effected upon the same plates and surfaces, the difficulty of imitation increased, and the process of printing facilitated. And also in an improved method of making and using dies and presses for coining money, stamping medals, and other useful purposes. And also for certain machinery, applicable to ornamental turning and engraving / Jacob Perkins.

In: The London journal of arts and sciences. - Vol. 1 (1820), no. 3. - P. 161–171 : pl. VIII. - (Recent patents).

MIP: pp. 165–167.

§ The magazine is also known after its editor Newton: Newton's journal.

English patent: A.D. 1819, October 11.–Nº 4400.

For the continuation see: **Perkins 3** (Jacob) [No. 548].

Title description after photocopy.

1 –

Line Engraving / Ruling Machine

2 –

Steel

3 –

Press / Printing in Black

In: TUD; *Woodcroft 1969*: 144–147.

Certain machinery and implements applicable to ornamental turning and engraving, and to the transferring of engraved or other work from the surface of one piece of metal to another piece of metal, and to the forming of metallic dies and matrices; and also improvements in the construction and method of using plates and presses for printing bank notes and other papers, whereby the producing and combining various species of work is effected upon the same plates and surfaces, the difficulty of imitation increased, and the process of printing facilitated; and also an improved method of making and using dies and presses for coining money, stamping medals, and other useful purposes / Jacob Perkins.

In: Mechanics' magazine. - Vol. 6 (1819 [?]). - P. 508.

NOT SEEN

In: *Woodcroft 1969*: 144–147.

Messrs. Perkins and Fairman's plan for preventing the forgery of bank notes.

In: The London journal of arts and sciences. - Vol. 2 (1820 [?]), no. 4. - P. 102–108 : pl. IV. - (Original communications).

§ Continuation of: **Perkins 2** (Jacob) [No. 547].

Title description after photocopy.

1 –

Line Engraving

2 –

Steel

In: TUD.

Siderographic process for multiplying copies of engravings, particularly with a view ot the prevention of forgery / [Jacob] Perkins, [Gideon] Fairman, and [Charles] Heath.

In: Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce. - Vol. 38 (1821). - P. 47–56 : [2] pl.

§ The two plates are specimens showing how little hardened steel intaglio printing plates do wear. Both are impressions of the same plate, the first printed at the beginning of the edition, the second after 30,000 impressions.

1 –

Line Engraving

2 –

Copper / Steel

3 –

Printing in Black

In: UBU.

Mémoire sur la Sidérographie, ou l'art de graver sur l'acier fondu / par [Jacob] Perkins, [Gideon] Fairman et [Charles] Heath.

In: Annales de l'industrie nationale et étrangère, ou mercure technologique; receuil de mémoires sur les arts, et métiers, les manufactures, le commerce, l'industrie, l'agriculture, etc. renfermant la description des musées des produits de l'industrie française. - Vol. 8 (1822). - P. 113–132 : [1] ill.

Supplier: p. 131.

§ In their comment (pp. 130–132) the editors mention a steel plate engraved by Molard in 1810; see **Molard** (C.P.) [No. 520]. This steel plate was printed in an edition of 40,000.

The plate accompanying the article is a specimen of steel engraving by Molard and dated in the plate '8bre 1810'.

1 –

Line Engraving / Ruling Machine

2 –

Copper / Steel

3 –

Printing in Black

In: KB.

Preparación de las planchas : comienza una serie de artículos destinados a explicar paso a paso los diferentes procesos del arte de grabar / J. Martín Pescador.

In: Grabado y edición. - Año I (2006), no. 1 (marzo). - P. 33–36 : [11] ill. of which [4] in colour. - (Proceso técnico).

§ Title means: Preparation of the plates: the start of a series of articles destined to explain step by step the different engraving processes

Concerns cutting a plate to size, polishing, bevelling and degreasing.

Copper / Steel / Zinc

In: Priv.Coll.

Phelps (Joseph)

See: **Warren** (Charles) [No. 615].

Ueber das Aetzen und Abdrucken von Daguerreotipen / C. Piil.

In: Gutenberg : Zeitschrift für Buchdrucker, Schriftgießer, Zeichner, Holzschneider, Graveurs, Stein- und Kupferdrucker, Galvanografen, Stilografen, Chimitipisten, Fotografen, Galvanoplastiker, Buchbinder, Glasätzer etc. - Vol. 1 (1855), no. 1. - P. 3–4 : [1] ill.

§ Title means: About the etching and printing of daguerreotypes

The illustration is a specimen of an impression of a daguerreotype plate, etched and printed as described in the article.

1 –

Line Etching

2 –

Copper / Silver

3 –

Ink / Paper / Printing in Black

4 –

Photography

5 –

Art History

In: HAB; Priv.Coll.; UBA.

Plastic engraving : new techniques.

In: Craft horizon. - Vol. 15 (1956), (Sep.). - P. 37.

1 –

Drypoint

2 –

Plastic

NOT SEEN

In: *Art Index* 10 (1955–1957): 308.

Plate printing.

In: The art-journal. - Vol. 11 (1849). - P. 353.

§ Discusses an invention of 'Mr. S. Leitch, of Edinburgh, lithographer' for copying prints.

3 –

Chine Collé / Counterproof

5 –

Conservation and Restoration

In: UBU.

Photopolymer printing plates / Eli Ponsaing.

In: Printmaking today. - Vol. 4 (1995). - P. 33 : [1] ill.

See also: **Ponsaing** (Valby 1995) [No. 245].

2 –

Photopolymer Plate

5 –

Health and Safety

In: Priv.Coll.

[On etching glass printing plates] / […] Prestl.

In: Mittheilungen des Gewerbevereins für das Königreich Hannover. - No. 33 (1845 [?]).

1 –

Line Etching

2 –

Glass

NOT SEEN

In: *Polytechnisches Journal* [No. 555.2].

555.2

Ueber Glasäzkunst / D. Red. d. p. J. [= Die Redaktion des polytechnischen Journals].
In: Polytechnisches Journal. - Vol. 26 (1845), no. 96. - P. 82–83.
§ Title means: On the art of etching glass
The recipe and etching process in **Böttger** & **Bromeis** (1855) [No. 392]: 29, col. 1, is nearly identical to Prestl's text.
In: UBA.

Pring (J.H.) 556.1

[On engraving steel plates and other polished surfaces by means of electricity] / J.H. Pring.
In: Philosophical magazine. - (1843), (Aug.). - P. 106 : ill. [?].
1 –
Electrical Engraving / Line Engraving
NOT SEEN
In: *Polytechnische Journal* [No. 556.2].

556.2

Radirung auf gehärtem Stahl und andern polirten Metallflächen mittelst Elektricität / von J.H. Pring.
In: Polytechnisches Journal. - Vol. 24 (1843), no. 90. - P. 181–182 : Tab. III, Fig. 84a–c.
In: UBA.

Printing ink that can be bleached 557

Printing ink that can be bleached.
In: The printing times and Lithographer. - New series, vol. 7 (1881), (15 July). - P. 187.
3 –
Ink
4 –
Lithography / Relief Printing
In: UBL

Professor Herkomer's New Art 558

Professor Herkomer's new art.
In: Scientific American. - Vol. 74 (1896), (22 Feb.). - P. 122.
§ On Hubert (von) Herkomer's 'spongotype', also known as 'Herkomertype'.
1 –
Monotype
2 –
Steelfacing
NOT SEEN
In: *Barnhill 2006*: no. 1122.

Q

Quenedy (...) 559

Anwendung des sogenannten Glas- oder Eispapiers / von […] Quenedy.
In: Der Handwerker und Künstler Fortschritte und Muster. - Vol. 2 (1827), no. 41. - P. 287.
§ Title means: Use of the so-called glass or ice paper
The material meant is probably a strong paper or thin cardboard made transparent.
1 –
Drypoint / Line Engraving
2 –
Cardboard
3 –
Printing in Black
In: NSUG.

R

Ramshaw (James) 560

Improved method of heating copper plates / [contributing letter by] James Ramshaw ; [drawn by W. Newton] ; [engr. by A.W. Warren].
In: Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce. - Vol. 36 (1819). - P. 95–97 : pl. 6–7.
§ Ramshaw was awarded the 'Gold Isis Medal' for his hot plates heated by steam.
The letter is dated, p. 95: '33, Fetter Lane, Fleet Street, March 10, 1818'.
See also: **Rauch** (1843) [No. 562].

3 –
Printing in Black
5 –
Conservation and Restoration / Health and Safety
In: UBU.

Nr. 61 [on transfer techniques for engravings].
In: Kabinet der natuurlyke historien, wetenschappen, konsten en handwerken. Deel 6 / W. van Ranouw. - Amsterdam : by Hendrik Strik, 1722. - P. 57–60.
1 –
Line Engraving
2 –
Copper
In: KB.

Rauch   562

Rauch's Wärmeapparat zum Grundiren der Platten für Kupferstecher.
In: Polytechnisches Journal. - Vol. 24 (1843), no. 88. - P. 318–319.
§ Title means: Rauch's heating apparatus for grounding engraver's plates
Information taken from, p. 319: 'Verhandl. des hessischen Gewerbv.' This is perhaps the 'Gewerbeblätter für Kurhessen', which would have taken it from an English magazine.
See also: **Ramshaw** (1819) [No. 560].
3 –
Printing in Black
In: UBA.

Reed (R.)   563

Simple etching for children / R. Reid.
In: School arts. - Vol. 55 (1956), (March). - P. 7–9.
1 –
Drypoint
NOT SEEN
In: *Art Index* 10 (1955–1957): 290.

Richmond (W.D.)   564.1

Acierage of copper-plates (I.) / by W.D. Richmond.
In: Printing times and Lithographer. - New series, vol. 1 (1892) (July). - P. 34–35.
Address of steelfacer: p. 35.
§ The first part of an article on steelfacing.
2 –
Copper / Steel / Steelfacing
In: *Bridson & Wakeman 1984*: no. B128.

564.2

Acierage of copper-plates (II.) / specially written for this Journal by W.D. Richmond.
In: Printing times and Lithographer. - New series, vol. 1 (1892), (Aug.). - P. 97–99.
§ This second part finishes with 'To be continued', but a third part was never published. Not in *Bridson & Wakeman*. British Library Document Supply Centre, letter of 28 September 1999: 'although the article states "to be continued", we have been unable to trace the required second [*sic* = third] part in issues for 1892, 1893 or 1894'.
2 –
Copper / Steelfacing
In: *Bridson & Wakeman 1984*: no. B128.

Rigg (A.)   565

Printing presses / A. Rigg.
In: Journal of the Society of Arts. - Vol. 22 (1892). - P. 238.
3 –
Press
NOT SEEN
In: *Poole 1892* (Print...).

Robert 1 (Jean)   566.1

Estampe nouvelle / [by Jean Robert].
In: Mercure de France. - (1748), (Nov.), 1st vol. - P. 163. - (Nouvelles litteraires).
§ Title means: New print
Announcement of a new print by Robert in the process by Le Blon.
This is the article to which Gautier reacted and the polemic began, see: **Gautier-Dagoty 1** (1748) [No. 452].
3 –
Multiple-plate Printing / Printing Polychrome

In: HAB.

566.2

Estampe nouvelle / [by Jean Robert].
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 55 (July–Dec. 1748; 1970). - P. 278.
In: KB.

Robert 2 (Jean)   567.1

Lettre de M. [Jean] Robert, graveur en couleur naturelle à M. Rémond de Sainte Albine.
In: Mercure de France. - (1749), (June). - P. 150–154.
§ Title means: Letter by M. (Jean) Robert, engraver in natural colours to M. Rémond de Sainte Albine
The letter is dated, p. 154: 'Ce 14 mars 1749'.
The introductory text refers to, pp. 149–150: 'le Mercure de Décembre 1748, page 179, & si l'on veut encore avoir cette complaisance, à celui d'Aout 1742, page 1839[-1841], & à celui de Mars 1745, page 143[-146]'. The first reference is to: **Gautier-Dagoty 1** (1748) [No. 452]. The second reference sketches a short history of printmaking and ends with the colour printing by Le Blon and Gautier. The third reference discusses the colour printing by Le Blon and Gautier.
1 –
Mezzotint
3 –
Multiple-plate Printing / Printing Polychrome
In: HAB; **Le Blon** (Stuttgart 1985) [No. 180.7]: 120, 145–146; *Rodari 1996*: 146; UBA.

567.2

Lettre de M. [Jean] Robert, graveur en couleur naturelle à M. Rémond de Sainte Albine.
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 56 (Jan.–June 1749; 1970). - P. 338–339.
In: KB.

Robert 3 (Jean)   568.1

Lettre à l'auteur du Mercure / [Jean] Robert.
In: Mercure de France. - (1756), (April), 1st vol. - P. 209–213. - (Gravure).
§ Title means: Letter to the author of the Mercure
The letter is dated, p. 212: 'A Rheims, ce 15 mars 1756'.
3 –
Multiple-plate Printing / Printing Polychrome
In: *Deville 1973*: 103 (Gravure en couleurs); *Rodari 1996*: 147.

568.2

Lettre à l'auteur du Mercure / [Jean] Robert.
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 70 (Jan.–June 1756; 1970). - P. 297–298.
In: KB.

Robins (William Palmer)   569

Making an etching / W.P. Robins.
In: Artist. - Vol. 46 (1953), (Sep.). - P. 4–5.
See also: **Robins** (London 1922) [No. 269].
1 –
Line Etching
NOT SEEN
In: *Art Index* 9 (1953–1955): 740.

Rogers (Angie)   570

Chine collé: a digital approach / Angie Rogers.
In: Printmaking today. - Vol. 9 (2000), no. 2 (summer). - P. 22.
3 –
Chine Collé
4 –
Digital Printmaking
In: Priv.Coll.

Rosa 1 (Sheila de)   571

Put your image on ImagOn / Sheila de Rosa.
In: Printmaking today. - Vol. 11 (2002) no. 3 (autumn). - P. 29 : [2] ill.
Literature: p. 29.
2 - Photopolymer Film
In: Priv.Coll.

Rosa 2 (Sheila de)   572

Etched by the sun / Sheila de Rosa.
In: Printmaking today. - Vol. 17 (2009) no. 4 (winter). - P. 28 : [3] ill.
§ Concerns printmaking with solarplates.
Editor's note: *Printmaking Today*, 18 (2009) 1: 4.
2 - Photopolymer Plate

In: Priv.Coll.

Rosa Pastor Cubillo (Blanca)
See: Martinez García (Óscar) & Rosa Pastor Cubillo (Blanca) [No. 515].

S

Sanger Shepherd (E.)   573

The cause of 'devils' or pits in photo-engraved copper plates / E. Sanger Shepherd.
In: Journal of the Society of Arts. - Vol. 43 (1895), (19 April). - P. 507–508. - (Correspondence).
§ Dated, p. 508: 'March 30th, 1895'.
Concerns deficiencies in copper plates used for photogravure and discusses ferric chloride as a mordant.
1 –
Photomechanical Etching
2 –
Copper
In: UBA (electronic).

Schultheiss 1 (C.)   574

Technique of copper engraving / C. Schultheiss.
In: Parnassus. - Vol. 13 (1941), (May). - P. 174–177.
§ C. Schultheiss is probably the same person as K.M. Schultheiss.
1 –
Line Engraving
NOT SEEN
In: *Art Index* 4 (1938–1941): 410.

Schultheiss 2 (K.M.)   575

Technique of line engraving / K.M. Schultheiss.
In: American artist. - Vol. 10 (1946), (Oct.). - P. 12–16.
§ C. Schultheiss is probably the same person as K.M. Schultheiss.
1 –
Line Engraving
NOT SEEN
In: *Art Index* 6 (1944–1947): 391.

Schwarz (H.) & **Böhme** (Rud.)   576.1

[New manner of etching copper and steel] / H. Schwarz, Rud. Böhme.
In: Annales de chimie et de pharmacie. - Vol. 66 (1848 [?]). - P. 61 or 69.
1 –
Line Etching
2 –
Copper / Steel
NOT SEEN
In: *Polytechnisches Journal* [No. 576.2]; *Tijdschrift ter bevordering van nijverheid* [No. 576.3].

576.2

Neues Verfahren in Kupfer und Stahl zu ätzen / von H. Schwarz und Rud. Böhme.
In: Polytechnisches Journal. - Vol. 29 (1848), no. 109. - P. 313–314.
§ This is the etching fluid called 'Dutch Bath' or 'Dutch Mordant'. See also: **New method of etching** (1849) [No. 533].
1 –
Line Etching
2 –
Copper / Steel
5 –
Health and Safety
In: UBA.

576.3

Manier van etsen op staal en koper / [H.] Schwartz [sic] und [Rud.] Böhme.
In: Tijdschrift ter bevordering van nijverheid. - Vol. 18 (1855), no. 1. - P. 15–16.
In: KB.

Semenoff 1 (Nik)   577

Safe etching - latest research / Nik Semenoff.
In: Printmaking today. - Vol. 18 (2009), no. 2 (summer). - P. 24–25 : [5] ill.
Literature: p. 25.
§ The article is followed by **Bytautas 2 (**2009) [No. 406].

1 –
Line Etching
2 –
Aluminium / Copper / Zinc
5 –
Health and Safety
In: Priv.Coll.

<div align="right">Semenoff 2 (Nik)   578</div>

Cupric chloride: safe disposal / [letter by] Nik Semenoff.
In: Printmaking today. - Vol. 18 (2009), no. 4 (winter). - P. 4.
§ Letter from the author following publication of the above article and **Bytautas 2** (2009) [No. 406], with further details on disposing waste produced.
1 –
Line Etching
2 –
Aluminium / Copper / Zinc
5 –
Health and Safety
In: Priv.Coll.

<div align="right">Semenoff (Nik) & Bader (L.W.)   579</div>

Intaglio etching on aluminum and zinc using an improved mordant / Nik Semenoff and L.W. Bader.
In: Leonardo. - Vol. 31 (1998), no. 2. - P. 133–138 : fig. 1.
§ Etching aluminium with a solution of copper sulphate, kitchen salt and sodium bisulphate in water.
1 –
Line Etching
2 –
Aluminium
5 –
Health and Safety
In: KB.

<div align="right">Semenoff (Nik) & Christos 1 (Christine)   580</div>

Using dry-copier toners and electro-etching on intaglio plates / Nik Semenoff, Christine Christos.
In: Leonardo. - Vol. 24 (1991), no. 4. - P. 389–394 : 5 fig.
1 –
Aquatint / Electrolytic Etching
In: KB.

<div align="right">Semenoff (Nik) & Christos 2 (Christine)   581</div>

Using dry-copier toners in printmaking / Nik Semenoff, Christine Christos.
In: Printmaking today. - Vol. 3 (1994), no. 4 (winter). - P. 21–22 : [6] ill.
Literature: p. 22.
§ Dry-copier toner is wetted and painted onto a transparent plastic sheet, which is used as a negative on photomechanical etching plates.
1 –
Aquatint / Photomechanical Etching
In: Priv.Coll.

<div align="right">Silbermann (Josef)   582</div>

Neue Druckmethode für Erd- und Himmelsgloben und Flächen jeder Art / von Josef Silbermann jun.
In: Gutenberg : Zeitschrift für Buchdrucker, Schriftgießer, Zeichner, Holzschneider, Graveurs, Stein- und Kupferdrucker, Galvanografen, Stilografen, Chimitipisten, Fotografen, Galvanoplastiker, Buchbinder, Glasätzer etc. - Vol. 2 (1856), no. 11. - P. 85.
§ Title means: New printing method for printing terrestrial and celestial globes of any kind
This concerns English patent: A.D. 1855, May 21.–№ 1139 and A.D. 1855, June 23.–№ 1445; *Woodcroft 1969*: 488–489, 493–494. A rubber balloon is placed inside a globe, the insides of which are engraved and inked in intaglio, the balloon is blown up and pressed into the incised lines to make an impression. The same technique can be used for flat plates placed in a square box.
2 –
Copper / Steel
3 –
Parchment / Printing in Black / Rubber
In: Priv.Coll.; UBA.

<div align="right">Sillimann (F.)   583</div>

Gravure sur le verre / F. Sillimann.
In: Annales de l'industrie nationale et étrangère. - Vol. 15 (1824). - P. 315.
§ Title means: Engraving glass
1 –
Line Etching

2 –
Glass
In: UBU.

Sincovitz (Peter)
See: Folkertsma (Sytze), Sincovitz (Peter) & Stijnman (Ad) [No. 445].

<div align="right">**Smee** (A.)   584</div>

Electrotype / [A. Smee].
In: The London journal of arts & sciences; and repertory of patent inventions. - Conjoined series, vol. 16 (1840). - P. 101–103 : pl. VII.
§ Transcription after digital scan.
1 –
Electrotype
In: *Bridson & Wakeman 1984*: no. A104; TUD; UBA.

<div align="right">**Smith** (Edith)   585</div>

Computer-assisted etching / Edith Smith
In: Leonardo. - Vol. 15 (1982). - P. 229–230 : 4 fig.
1 –
Line Etching
4 –
Digital Printmaking
In: KB.

<div align="right">**Smith** (Kate)   586</div>

Material benefits / Kate Smith.
In: Printmaking today. - Vol. 12 (2003), no. 3 (spring). - P. 29.
Literature: p. 29.
1 –
Photomechanical Etching
In: Priv.Coll.

<div align="right">**Solly** (Richard Horsman)   587.1</div>

Mr. Solly's communication / R[ichard] H[orsman] Solly ; drawn by J. Clement ; engraved by Edm[und] Turrell.
In: Report of the committee of the Society of Arts, &c. together with the approved communications and evidence upon the same, relative to the mode of preventing the forgery of bank notes. - London : Society of Arts, &c, 1819. - P. 40–59 : pl. [4]–[5].
§ Supplement to: Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce, vol. 36 (1819).
Solly's 'communication' is dated, p. 40: 'Great Ormond Street, 16th Dec. 1818'.
Text on the roller press with D-rollers on pp. 52–55.
For Edmund Turrell see also: **Turrell 1** (1817) [No. 604]; **Turrell 2** (1824) [No. 605].
1 –
Line Engraving / Ruling Machine
2 –
Copper / Steel
3 –
Ink / Mechanised Intaglio Printing / Paper / Press / Printing in Black
In: *Hunnisett 1980*: 180; UBU.

<div align="right">587.2</div>

Report of the committee of the Society of Arts ... together with the approved communications and evidence upon the same, relative to the mode of preventing the forgery of bank notes. - London : Society of Arts, 1819. - III, 72 p. : 6 pl.
§ Likely the same text by Solly on the roller press with D-rollers. *Bridson & Wakeman*: 'The "approved communications" are by T.B. Beaumont, T.C. Hansard, T. Ramson, Mr. Solly [= Description of the improved copper-plate printing press for bank notes, pp. 55–59, 1 pl.], and R. Williamson. The pls. incl. specimens for Hansards's typographic banknote, and Ransom's, Solly's and Williamson's engraved notes.'
NOT SEEN
In: *Bridson & Wakeman 1984*: no. B48.

<div align="right">**Steel and iron facing**   588</div>

Steel and iron facing.
In: The printing times and Lithographer. - New series, vol. 8 (1882). - P. 110–112 : 1 ill.
1 –
Electrotype
2 –
Copper / Steelfacing
In: *Bridson & Wakeman 1984*: no. B121; UBA; UBL.

Stijnman (Ad)
See also: **Stijnman** 1 (Ad) [No. 324].
See also: **Stijnman** 2 (Ad) [No. 325].

Tips voor het bewaren van drukinkt op oliebasis / Ad Stijnman.
In: kM. - (1994), 10 (summer). - P. 29–30.
§ Title means: Tips for keeping oil-based printing ink
3 –
Printing in Black
In: Priv.Coll.; RCE.

<div align="right">Stijnman 1 (Ad)   589</div>

Tips voor het reinigen met VCA / Ad Stijnman.
In: kM. - (1994), no. 11 (autumn). - P. 37.
§ Title means: Tips for cleaning with VCA
See also: **Folkertsma** & **Stijnman** (1995) [No. 444]; **Folkertsma**, **Sincovitz** & **Stijnman** (1996) [No. 445].
5 –
Health and Safety
In: Priv.Coll.; RCE.

<div align="right">Stijnman 2 (Ad)   590</div>

Kopersulfaat voor zink: veilig, makkelijk en goedkoop etsen / Ad Stijnman.
In: kM (1999). - no. 31 (autumn). - P. 30–32 : [2] ill.
§ Title means: Copper sulphate for zinc: safe, easy and cheap etching
1 –
Line Etching
2 –
Zinc
5 –
Health and Safety
In: Priv.Coll.; RCE.

<div align="right">Stijnman 3 (Ad)   591</div>

Some notes on using ferric chloride … / Jane Stobart.
In: Printmaking today. - Vol. 6 (1997), no. 1 (spring). - P. 230.
§ Reaction: M. Carter, 'A Correction to the Technical Tip on Ferric Chloride in Vol. 6, No 1', in *Printmaking Today*, 6 (1997) 3: 28.
See also: **Stobart** (London 2001) [No. 326].
1 –
Line Etching
In: Priv.Coll.

<div align="right">Stobart 1 (Jane)   592</div>

Gouache lift / Jane Stobart.
In: Printmaking today. - Vol. 6 (1997), no. 4 (winter). - P. 28.
See also: **Stobart** (London 2001) [No. 326].
1 –
Lift-ground
In: Priv.Coll.

<div align="right">Stobart 2 (Jane)   593</div>

Understanding your ground / Jane Stobart.
In: Printmaking today. - Vol. 10 (2001), no. 3 (Autumn). - P. 28–29.
See also: **Stobart** (London 2001) [No. 326].
1 –
Line Etching / Soft-ground
In: Priv.Coll.

<div align="right">Stobart 3 (Jane)   594</div>

Etchings : good proofs & bad / David Strang ; plate by John Taylor Arms.
In: Print collector's quarterly. - Vol. 26 (1939). - P. 136–159 : [14] fig.
See also: **Strang** (London 1930) [No. 328].
3 –
Printing in Black
4 –
Troubleshooting
In: UBL-KHI.

<div align="right">Strang 1 (David)   595</div>

Etching. Part III: The printer proves the plate / David Strang ; [comment by John Taylor Arms].
In: Print. - Vol. 2 (1941), no. 3/4 (Oct.–Dec.). - P. 101–112 : 11 fig.
§ Pt. 1 in vol. 2 (1941), no. 1 (May–June), pp. 47–59: Etching and drypoint, part I: background / Robert McDonald; this is art historical.
For part II see: **Eby** (1941) [No. 435].

<div align="right">Strang 2 (David)   596</div>

The figures show different impressions of the same etching by John Taylor Arms, their appearance depending on the manner of wiping.
See also: **Strang** (London 1930) [No. 328].
3 –
Printing in Black
In: *Art Index*, 5 (1941–1944): 838; RMA.

<div align="right">

Strang 3 (David)   597

</div>

The printing of your etchings / David Strang.
In: Artist. - Vol. 28 (Sep. 1944–Feb. 1945). - P. 20–21, 44–45, 68–69, 92–93, 116–117, 140–141.
See also: **Strang** (London 1930) [No. 328].
3 –
Printing in Black
NOT SEEN
In: *Art Index*, 6 (1944–1947): 1074.

T

<div align="right">

Tableaux imprimés 1   598.1

</div>

Tableaux imprimés.
In: Mercure de France. - (1742), (Août). - P. 1839–1841.
§ Title means: Printed paintings
Short summary of printmaking and especially the history of colour printing. Jacque Christoph Le Blon and Jacques-Fabien Gautier-Dagoty are mentioned.
3 –
Multiple-plate Printing / Printing Polychrome
In: HAB.

<div align="right">

598.2

</div>

Tableaux imprimés.
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 43 (Juillet–Décembre 1742; 1970). - P. 97–98.
In: KB.

<div align="right">

Tableaux imprimés 2   599.1

</div>

Tableaux imprimés.
In: Mercure de France. - (1745), (Mars). - P. 143–146.
§ Title means: Printed paintings
Colour prints by Jacque Christoph Le Blon and especially Jacques-Fabien Gautier-Dagoty are discussed.
3 –
Multiple-plate Printing / Printing Polychrome
In: HAB.

<div align="right">

599.2

</div>

Tableaux imprimés.
In: Mercure de France. - [Photom. repr.]. - Genève : Slatkine Reprints, 1968–1974. - Vol. 48 (Jan.–Juin 1745; 1970). - P. 206–207.
In: KB.

<div align="right">

Talbot (William Henry Fox)   600.1

</div>

Improvements in the art of engraving / William Henry Fox Talbot.
In: The repertory of patent inventions. - (1858), (Nov.).
NOT SEEN
In: *Journal of the Franklin Institute* [No. 600.2]; UBA.

<div align="right">

600.2

</div>

Improvements in the art of engraving. Patented in London, by William Henry Fox Talbot, April 21, 1858.
In: Journal of the Franklin Institute of the state of Pennsylvania, for the promotion of the mechanic arts. - Vol. 67 (1859). - P. 193–197.
§ Title page of journal: 'Third series. vol. XXXVII. Whole no. vol. LXVII'.
Describes Talbot's 'Photoglyphic engraving'.
English patents: 565, October 29, 1852 and 875, April 21, 1858. Neither patent is in *Woodcroft 1969*.
1 –
Line Etching / Photomechanical Etching
2 –
Copper / Steel / Zinc
4 –
Nature Printing / Photography
5 –
Health and Safety
In: *Poole 1882* (Engraving); UBA.

Encre nouvelle ou couleur noire / [Jos. et Xav. Tlappa].

In: Annales de l'industrie nationale et étrangère, ou mercure technologique; receuil de mémoires sur les arts, et métiers, les manufactures, le commerce, l'industrie, l'agriculture, etc. renfermant la description des musées des produits de l'industrie française. - Vol. 19 (1825). - P. 103–104.

§ Title means: New ink or black colour

Original article not given, but reference to: 'La commission centrale d'administration de le société polytechnique d'Ausbourg'.

3 –

Ink

4 –

Painting

In: UBU.

Lift ground etching / F. Tauber.

In: American artist. - Vol. 20 (1956), (May). - P. 40–43.

1 –

Aquatint / Lift-ground

NOT SEEN

In: *Art Index*, 10 (1955–1957): 312 [under 'Taubes']; *Blas Benito 1994*: 88 [under 'Taliber'].

Toms (Rebecca)

See: Ward (Nicholas) [No. 614].

On the invention, progress and advantages of the art of engraving in mezzotint upon steel / [contributing letter by] Charles Turner.

In: Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce. - Vol. 42 (1824). - P. 55–57.

Suppliers: p. 57.

§ The letter is dated, p. 55: 'London, October 14, 1824'.

1 –

Mezzotint

2 –

Brass / Steel

In: *Bridson & Wakeman 1984*: no. B97; *Hunnisett 1980*: 43 n. 21, 52 n. 48 and 49; TM; UBU.

A drawing board and T square / Edmund Turrell ; [drawn and] engraved by Edmund Turrell.

In: Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce. - Vol. 34 (1817). - P. 139–143 : pl. 10 ; 25 1/2 cm.

Supplier: p. 141.

§ Turrell was awarded the 'Silver Medal and Five Guineas' for his drawing board and T square; p. 139.

Turrell's address is, p. 143: 'No. 11, Gee Street, Clarendon Square'.

For work by Turrell see also: **Solly** (1819) [No. 587].

1 –

Line Engraving / Line Etching

In: UBU.

Menstruum for biting-in on steel plates / Edmund Turrell

In: Transactions of the Society for the Encouragement of Arts, Manufacture, and Commerce. - Vol. 42 (1824). - P. 43–51.

§ The manuscript is in the Library of the Royal Society of Arts (D5/26).

For comments on the mordants see: **Caelator** (1834) [No. 407]; **Elsner** (1838) [No. 426].

For work by Turrell see also: **Solly** (1819) [No. 587].

1 –

Line Etching

2 –

Steel

In: *Hunnisett 1980*: 48 n. 32 and 34; TM; UBU.

[Menstruum for biting-in on steel plates] / Edmund Turrell

In: Gill's technical repository. - (1824).

NOT SEEN

In: **Turrell 4** (1825) [No. 607]: 51.

Mordant propre à la gravure sur acier.

In: Annales de l'industrie nationale et étrangère, ou mercure technologique; receuil de mémoires sur les arts, et métiers, les manufactures, le commerce, l'industrie, l'agriculture, etc. renfermant la description des musées des produits de l'industrie française. - Vol. 23 (1826). - P. 100–101.

§ Summary of the original article.

In: UBU.

[Summary of the original article].

In: Journal des connaissances usuelles. - (1834), (March). - P. 155.

NOT SEEN

In: *Polytechnisches Journal*, see [No. 605.5]; TUD.

605.5

Ueber einige Beizen für den Stahlstich.
In: Polytechnisches Journal. - Vol. (1834), no. 52. - P. 319.
§ Summary of the articles **Humphrys** (1826) [No. 487] and **Turrell** (1824) [No. 605.1] taken from the 'Journal des connaissances usuelles'. **Cooke** (1826) [No. 420] is not referred to.
1 –
Line Etching
2 –
Steel
In: UBA.

Etching ground for engravers / Edmund Turrell.
In: Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce. - Vol. 43 (1825). - P. 58–67.
§ Turrell receives 'The Thanks of the Society' for his etching ground: p. 58.
1 –
Line Etching
2 –
Copper
In: UBU.

606.2

On a mode of preparing etching-ground for engravers / E. Turrell.
In: Journal of the Franklin Institute. - Vol. 2 (1826), no. 2 (Aug.). - P. 83–86.
§ Partly summarised after the original article.
1 –
Line Etching
2 –
Copper
In: OCLC; *Poole 1882* (Etching).

[On rendering gravers capable of engraving steel-plates] / [contributing letter by] Edmund Turrell.
In: Gill's technical repository. - (1825).
§ The letter is dated: 'October 15, 1825'.
1 –
Line Engraving
2 –
Steel
NOT SEEN
In: *The Franklin Journal*, see [No. 607.2].

607.2

On rendering gravers capable of engraving steel-plates / Edmund Turrell.
In: The Franklin journal, and American mechanics' magazine; devoted to the useful arts, internal improvements, and general science. - Vol. 1 (1826), no. 1 (Jan). - P. 51–54.
1 –
Line Engraving
2 –
Steel
In: RCE (microfilm).

V

El grabado a buril / Julia Vallinot González.
In: Grabado y edición. - Año II (2007), no. 8 (mayo). - P. 48–53 : [18] ill. in colour. - (Proceso técnico).
§ Title means: Burin engraving
1 –
Line Engraving
2 –
Copper / Steel
3 –
Ink
In: Priv.Coll.

[Verfertigung einer dauerhaften schwarzen Farbe der Kupferdrucker].
In: Wittenbergsches Wochenblatt zum Aufnehmen der Naturkunde und des ökonomischen Gewerbe. - Vol. 5 (1772). - P. 183.
§ Title means: Preparation of a permanent black ink for plate printers
3 –
Ink
In: ULH.

609.2

Recept zu einer Kupferdruckfarbe.
In: Mannigfaltigkeiten. Eine gemeinnützige Wochenschrift. - Vol. 4 (1773). - P. 302.
§ Title means: Recipe for an intaglio ink
3 –
Ink
In: NSUG.

Vial (E.)   610.1

[New manner of engraving and of transferring old engravings] / E. Vial.
In: Comptes Rendus. - Vol. 66 [1863?]. - P. 470.
1 –
Line Etching / Relief Etching
2 –
Iron / Steel / Zinc
NOT SEEN
In: *Tijdschrift* [No. 610.2].

610.2

Nieuwe wijzen om te graveren en oude kopergravuren over te drukken / volgens E. Vial.
In: Tijdschrift uitgegeven door de Nederlandsche Maatschappij ter Bevordering van Nijverheid. - Vol. 27 (1864). - P. 153–154.
In: KB.

Vogel (Frits)   611

Darstellung kupferner Copien von Stahl- und Kupferplatten, zum Abdruck in der Kupferdruckpresse / von Fritz Vogel.
In: Polytechnisches Journal. - Vol. 29 (1848), no. 110. - P. 425–427.
§ Title means: Making copper copies of steel and copper plates, for printing in the roller press
1 –
Electrotype
In: UBA.

W

Wagner (C.A.)   612

Papier in Verbindung mit Geweben so herzurichten, daß es dem Wasser widersteht und zum Abdruck von Kupferstichen etc. dienen kann / C.A. Wagner.
In: Gutenberg : Zeitschrift für Buchdrucker, Schriftgießer, Zeichner, Holzschneider, Graveurs, Stein- und Kupferdrucker, Galvanografen, Stilografen, Chimitipisten, Fotografen, Galvanoplastiker, Buchbinder, Glasätzer etc. - Vol. 2 (1856), no. 11. - P. 85.
§ Title means: Binding paper to textile in such a way that it can resist water and is suitable for printing copper engravings
3 –
Multiple-plate Printing / Paper / Printing in Black
4 –
Planographic Printing
In: Priv.Coll.; UBA.

Waimon (Deborah)   613

Points of reference / Deborah Waimon.
In: Printmaking today. - Vol. 12 (2003), no. 3 (autumn). - P. 27 : [2] ill.
1 –
Collagraph
In: Priv.Coll.

Ward (Nicholas)   614

Durable drypoint tools / Nicholas Ward,
In: Printmaking today. - Vol. 6 (1997), no. 2 (summer). - P. 31.
§ Correction by the editor: R. Toms & P. Penketh, 'Non-metal drypoints', in *Printmaking Today*, 6 (1997) 3: 28. This is the second part of the above article, apparently written by different authors.
1 –
Drypoint
In: Priv.Coll.

Engraving on steel plate / C[harles] Warren ; [coop. Joseph Phelps].
In: Transactions of the Society for the Encouragement of Arts, Manufacture, and Commerce. - Vol. 41 (1823). - P. 88–95.
§ Warren was awarded the 'Large Gold Medal' for his work on steel engraving.
The article was written after Warren's death on 23 April 1823 with assistance of his pupil Joseph Phelps (pp. 88–89).
For a comment on Warren's etching fluid see: **Caelator** (1834) [No. 407]: 22.
1 –
Line Engraving / Line Etching
2 –
Steel
In: *Bridson & Wakeman 1984*: no. B95; *Hunnisett 1980*: 31, 43, 46 n. 26, 48 n. 33, 206; TM; UBU.

[On steel engraving] / Charles Warren
In: Repertory of arts. - (1823–1825?)
NOT SEEN
In: *Annales de l'industrie*, see [No. 615.3].

Sur un perfectionement dans l'art de graver dur l'acier / par [Charles] Warren.
In: Annales de l'industrie nationale et étrangère, ou mercure technologique; receuil de mémoires sur les arts, et métiers, les manufactures, le commerce, l'industrie, l'agriculture, etc. renfermant la description des musées des produits de l'industrie française. - Vol. 19 (1825). - P. 289–292.
§ Summary of the original article, p. 289: 'Extrait du Repertory of arts, etc.'
In: UBU.

On improvements in the art of engraving on steel / by C[harles] Warren.
In: Journal of the Franklin Institute of the State of Pennsylvania; devoted to the mechanic arts, manufactures, general science, and the recording of American and other patented inventions. - Vol. 3, new series (1829), no. 3 (March). - P. 166–170.
§ Copied from the 'Transactions'.
'Vol. 3, new series' is 'vol. 7' according to the old calculation.
Title description after microfilm.
In: OCLC; *Poole 1882* (Engraving); RCE (microfilm).

On etching fluids / J. Waterhouse.
In: Photographic news. - Vol. 26 (1882). - P. 166–167, 246–247, 370–372.
§ Title description after photocopy.
1 –
Electrolytic Etching / Line Etching
2 –
Brass / Bronze / Copper / Steel / Zinc
4 –
Lithography / Photography / Relief Printing
5 –
Health and Safety
In: BL; *Bridson & Wakeman 1984*: no. B123.

Etching on celluloid / L.K. Weber.
In: Design. - Vol. 42 (1941), (Feb.). - P. 14–15.
1 –
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2 –
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NOT SEEN
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1 –
Collagraph

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Wollaston (...)   **620**

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NOT SEEN
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Wray 1 (Peter)   **621.1**

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621.2

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1 –
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2 –
Aluminium
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3 –
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NOT SEEN
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623.2

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Z

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Photopolymer films; a safer and more versatile photo-resist for intaglio / Mark Zaffron.
In: California printmaker. - Vol. 1, (1995), no. 1 (April). - P. 27.
2 –
Photopolymer Film
5 –
Health and Safety
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§ Concerns acrylic etching ground.
1 – Aquatint / Line Etching
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Indices to the Bibliography of Practical Manuals

Indices to the Manuscripts

The manuscripts are not described in a separate list because most are related to a printed publication such as notes in a book, a handwritten copy after a printed book or the manuscript for a printed publication; otherwise the context of the manuscript would be lost. Instead all manuscripts are entered in the bibliography and indexed by serial number and chronologically respectively in the two lists below.

Index by serial number

004.1   1782
009.1   1829
013   1800 c.
024.5   1673
029.2   1851
039.1   1769
041.1   1632 c.
041.2   1635
042.1   1637
042.3   1650–1700
042.4   1645–1725
042.5   1662–1700
042.9   1745–1800
042.10   1851
042.14   1700 c.
042.18   1750 c.
042.20   1760
042.27   1662–1700
042.28   1700 c.
049.2   1670–1700
049.3   1700–1750
050.3   1650–1660
062.1   1565–1567
093   1546
095   1600–1625
097.1   1661
097.3   1660–1662
098.2   1670
102   1693–1698
133.4   1900 c.
137   1732
139.1   1927–1931
148.1   1920–1925
150.1   1915–1945
157   1640 c.
158   1650 c.
178.4   1951

182.1   1770 c.
192.1   1683
193   1650–1700
195   1810
199.1   1570 c.
200   1623
205.1   1900–1915
206.1   1700 c.
208.2   1805–1850
208.3   1810 c.
210.1   1760 c.
221   1600–1700
222   1600–1700
225   1650–1700
228.1   1590–1625
261.3   1920–1930
263   1618–1628
268.11   1915–1925
270.7   1943–1948
271.1   1873–1894
280   1780 c.
285.1   1775
286.1   1801
298.1   1698
320.1   1886
324   1979
328.2   1949
332.1   1649–1659
334.1   1677–1680
338   1767
340   1620–1646
341.1   1620–1646
343.1   1630 c.
344.1   1655 c.
345   1920 c.
347   1736–1739
358   1900 c.
605.1   1824

Chronological index

General Index

Places of publication

A

B

C

D

E

F

G

H

I

J

N

O

P

Q

R

S

T

Chronological index

(possible) ghost   042.15, 137, 154.2, 236.9, 304.2

██

1500–1525   253.1
1546   093
1555   007
1565–1567   062.1
1568   062.2
1570 c.   199.1
1590–1625   228.1

██

1600–1625   095
1600–1700   221, 222
1607   368.1
1607–1610   368.8
1612–1614   368.9
1616   050.1
1618–1628   263
1618–1651   368.10
1620–1630   200
1620–1646   340, 341.1
1621   368.2
1627   368.3, 368.6
1630 c.   343.1
1632   041.1
1634   024.1, 024.2, 050.2
1635   024.3, 041.2
1637   042.1
1640 c.   157
1645   042.2
1647   040.1, 368.4
1645–1725   042.4
1649–1659   332.1
1650   059.1
1650 c.   158
1650–1660   050.3
1650–1700   042.3, 193, 225
1652   040.2, 042.12
1654   024.4
1655 c.   344.1
1656   368.5
1660   040.3, 048
1660–1662   097.3
1661   097.1
1662   042.26, 042.29, 097.2
1662–1700   042.5, 042.27
1666   003, 040.4
1667   050.4
1668   098.1
1669   042.13, 049.1
1670   098.2
1670–1700   049.2
1672   091, 284.1
1673   024.5, 042.15, 284.2, 368.11
1675   040.5, 049.4, 284.3
1675–1679   288.1
1677–1680   334.1
1678   284.4
1679   357.1
1679–1680   040.6
1681   284.5
1683   192.1, 288.2
1685   040.7, 284.6
1688   098.3

1689   042.16
1693   115.1
1693–1698   102
1696   186
1697   040.8
1698   040.9, 298.1
1699   122
1699–1700   181.1
1700   042.14, 042.28, 206.1

1700–1750   049.3
1701   042.6, 042.7, 284.7
1702   042.30, 181.2
1703–1705   187
1704   223.1
1705   040.10
1707   111, 177.1
1707–1709   111
1708   368.12
1710   040.11
1712   177.2
1714   177.3
1715–1724   230.1
1716   177.4, 342.14
1718   040.12
1719   042.17, 068.1, 068.1, 223.2
1720   055.1
1721   176.1, 342.15, 424, 514
1722   176.2, 425, 561
1723   055.4
1725   180.1
1726   097.4
1727   055.8, 055.8
1728   057
1728–1730   177.7
1729   068.2
1730   055.9, 055.9, 055.10, 176.3
1731   040.13, 055.2, 062.3, 223.3
1731–1732   526.1
1732   137
1733   055.5, 223.4, 526.2
1735   055.16
1736   068.3
1736–1739   347
1738   177.10, 505.1
1740   177.5
1740–1745   118.1
1741   336.1
1742   055.14, 598.1
1743   068.4
1744   055.11, 230.3
1744–1745   181.3
1745   042.8, 042.19, 599.1
1745 –1800   042.9
1746   042.19, 055.12
1747   304.1, 336.2
1748   452.1, 566.1
1749   230.4, 453.1, 454.1, 521.1, 567.1
1750   042.18
1750 c.   181.4
1751   342.16
1753   055.13, 055.13, 068.5, 223.5, 453.2
1755   012.1, 055.17, 097.5, 522.1
1756   055.15, 180.2, 455.1, 523.1, 568.1
1757   012.2, 012.3
1758   042.11, 080.1, 304.2, 342.17
1759   097.6

1760   042.20, 045.1
1760 c.   210.1
1761   042.21, 181.5, 277.1
1763   012.4, 012.5, 223.6, 377.1
1764   068.6, 080.2
1765   042.23, 097.7
1766   042.22, 304.3
1766–1767   342.18
1767   338
1768   012.6, 176.4, 180.3
1768 c.   045.2
1769   012.7, 039.1, 097.8, 506.1
1769 or later   042.11
1770   045.3, 304.4
1770 c.   182.1
1771   507.1
1772   042.24, 045.4, 056.1, 609.1
1773   014.1, 014.1, 045.5, 056.2, 319.1, 609.2
1775   285.1, 342.1
1776   296.1, 297.1, 297.2
1777   012.8, 012.9
1778   068.7, 177.11, 342.2
1780   045.6, 045.7, 055.6, 182.2, 213, 319.2, 342.3, 508.1
1780 c.   280
1782   004.1
1783   045.8, 297.3
1784   177.8, 502
1785   014.2, 014.2, 045.9, 084, 159.1
1786   012.10, 012.11, 045.10, 055.3
1787   045.11, 159.2, 159.3, 177.13
1788   045.12, 223.7
1790   337.1
1790 c.   342.5
1790–1791   342.19
1791   012.12, 182.3, 342.4
1792   256.1, 337.2
1793   301, 510.1
1794   045.13, 317
1794–1797   249.1
1795   062.4, 293.1, 342.6, 062.4
1795–1796   042.25
1795–1797   230.2
1796   080.3, 105, 159.4
1796 or later   257
1797   012.13, 067, 160
1798   342.7, 510.3
1798 c.   510.2
1799   012.14, 045.14, 373, 396.1, 536, 537
1799–1800 c.   342.8
1800   146.1, 256.2, 289, 342.9, 396.2, 510.4

1800 c.   013, 045.16
1800–1801   342.20, 342.21
1801   042.31, 045.15, 045.17, 045.18, 081.1, 129.1, 177.14, 286.1, 342.22
1802   045.19, 055.7, 146.2
1803   045.20, 106.1, 249.2, 380, 501
1804   068.8, 106.2, 129.2, 208.1
1805   107, 147.1, 300
1805–1850   208.2
1806   045.21, 146.3, 302
1806–1811   062.5
1807   045.22, 081.2
1808   081.3
1809   045.23, 090.1, 342.10
1810   045.24, 045.25, 081.4, 081.5, 129.3, 152.1, 195, 208.3, 342.11, 546.2
1810 c.   012.15
1811   135, 476.1, 476.2, 520, 546.1
1813   045.26, 152.2, 410, 440

1814   045.27, 342.12
1815   081.6, 166, 215
1816   342.13
1817   012.16, 018, 147.2, 177.12, 604
1818   012.17, 045.28
1818–1819   177.9
1819   547.2, 560, 587.1, 587.2
1820   547.1, 548
1821   081.7, 147.3, 473, 539, 549.1
1821–1822   371
1822   085, 090.2, 090.2, 538, 549.2
1823   001, 152.3, 459, 513, 615.1
1823–1825   615.2
1824   409, 583, 603, 605.1, 605.2
1825   012.18, 097.10, 147.4, 460.1, 601, 606.1, 607.1, 615.3
1825 c.   231.1
1826   045.29, 136.1, 420.1, 487.1, 540.1, 542.1, 542.2, 542.3, 542.4, 542.5, 542.6, 542.7, 605.3, 606.2, 607.2
1827   136.2, 337.3, 420.2, 420.3, 420.4, 460.2, 476.3, 476.4, 487.2, 487.3, 540.2, 542.8, 559
1828   413.4, 413.5, 413.6, 413.7, 413.8, 413.9, 413.1, 413.2, 413.3, 413.10, 519.1, 519.2
1829   009.1, 265, 434, 615.4
1830   234.1, 296.2, 368.7
1831   189.1, 234.4
1833   433.1
1833–1835   062.6
1834   081.9, 097.11, 142, 407, 433.2, 477, 487.4, 487.5, 605.4, 605.5
1835   420.5, 423.1, 423.2
1835 c.   231.2
1836   075.1, 177.6, 388.1, 388.2, 492
1837   029.1, 081.8, 189.2, 498.1, 498.2
1838   075.2, 075.2, 147.5, 436.1, 436.2
1839   081.10
1840   081.12, 216, 387, 428.1, 428.2, 467, 486, 584
1840 c.   062.7
1841   100.1, 497.1, 497.2
1842   045.30, 224, 416.1, 416.2, 447.1, 447.2, 447.3, 447.4, 447.5, 447.6, 447.7, 447.8, 447.9, 447.10
1843   062.8, 372, 447.11, 504, 556.1, 556.2, 562, 391.3
1844   100.2, 100.3, 234.2, 391.1, 391.2, 391.4, 391.5, 415, 416.3, 443.1, 443.2
1845   175, 555.1, 555.2, 623.1
1845 c.   062.9
1846   062.10, 449.1, 623.2
1847   062.11, 064.1, 081.11, 438, 449.2, 450.1, 450.2
1847–1858   064.2
1848   576.1, 576.2, 611
1849   008.1, 015.1, 060, 081.13, 228.2, 404, 553
1850   488
1850 c.   439, 457
1851   008.2, 015.2, 029.2, 042.10
1852   062.12, 491
1853–1854   198
1855   392, 551, 576.3
1856   397, 426.1, 426.2, 582, 612
1857   062.13, 458.1, 458.2
1858   015.3, 064.3, 494, 495.1, 496, 600.1
1858–1859   495.12
1859   064.4, 495.2, 495.3, 495.4, 495.5, 495.6, 495.7, 495.8, 495.9, 495.10, 495.11, 495.13, 509, 516, 600.2
1860   398.1, 529, 531
1860 c.   620
1861   389.1
1863   044.1, 081.14, 291, 389.2, 610.1
1864   064.5, 247.1, 610.2
1865   234.3, 456
1865–1866   431.1
1866   178.1, 468, 470, 437.1
1867   062.14, 398.2
1870   064.6, 309.1, 471
1871   133.1
1872   044.2
1873   064.7, 248.1
1873–1894   271.1
1874   376

1875   133.2, 472
1876   378
1877   044.3, 064.8, 374, 390
1878   178.2, 451
1879   035, 178.3, 182.4
1880   029.3, 100.4, 178.12, 178.13
1880 c.   178.19, 178.20, 178.21
1880–1882   412
1881   100.5, 133.3, 133.3, 133.5, 178.5, 490, 557
1882   065.1, 469, 588, 616
1883   065.2, 065.3, 268.1, 268.2, 268.3
1884   178.14, 178.15, 379
1885   100.6, 100.7, 168, 268.4, 268.5, 268.6
1885 c.   178.6
1886   065.4, 320.1
1887   074.1
1887–1888 c.   178.7
1888   270.1, 308.1, 308.2, 393, 442, 489
1889   079.1, 270.6, 270.8, 270.9, 308.3, 309.2, 375, 517
1890   264, 518
1891   083, 207.1
1892   143, 178.8, 178.16, 564.1, 564.2, 565
1892–1893   543.1, 543.2, 543.3, 543.4, 543.5, 543.6
1892–1894   543
1893   062.15, 308.4
1893–1894   543.7, 543.8, 543.9, 543.10, 543.11, 543.12
1894   002, 006.1, 072, 349.1
1895   076.1, 232.1, 232.1, 573
1896   558
1897   108.1, 178.9, 178.10
1897–1898   427
1898   062.16, 308.5
1899   021.1, 400

1900 c.   266.1, 079.2, 133.4, 268.7, 358
1900–1915   205.1
1901   026.1, 062.17, 108.2, 341.2, 367.1
1903   270.2
1904   043
1905   114
1905 c.   309.3
1906   097.12, 318.1, 535
1907   026.2, 116, 217.1, 320.2
1908   062.19
1909   232.2, 251.1, 251.3, 251.4, 278, 305.1
1910   124, 268.8
1911   270.3
1912   133.6, 217.2, 367.2
1913   254, 268.9, 403
1914   242.1, 242.2, 261.1, 261.2, 349.2
1915   242.3
1915 c.   268.10
1915–1925   268.11
1915–1945   150.1
1916   054, 155, 180.4, 205.2, 305.2
1917   367.5
1919   270.4, 367.3
1920   153.1, 178.11, 305.3, 370
1920 c.   099, 345
1920–1925   148.1
1920–1930   261.3
1921   217.3, 312
1922   021.2, 036.1, 145.1, 242.4, 242.5, 269.1, 270.5, 305.4, 367.6
1923   062.18, 145.2
1923   153.2, 153.3, 188.1, 269.2, 367.4
1924   036.2, 042.32, 087.1, 087.2, 087.3, 188.2, 197.1, 205.3, 243.1, 243.2, 261.4, 269.3, 269.4, 318.2, 349.3
1925   191.1, 191.2, 191.3, 251.2, 273, 288.3, 288.4

1982 032, 068.9, 104.3, 169, 262.5, 271.2, 503, 585
1983 062.34, 096.1, 096.2, 132.1, 132.2, 170, 315
1984 039.3, 063.5, 079.7, 109, 183.2, 234.6, 292.6, 332.2, 341.6
1985 096.3, 121.1, 121.2, 173, 180.7, 229, 262.6, 325.3, 368.14, 526.3
1985–1987 033.2
1986 020.3, 027.2, 042.39, 042.40, 077, 104.4, 104.5, 115.4, 162.1, 241.3, 258.1, 294.3, 295
1986 c. 074.2
1987 004.2, 068.10, 212, 267, 286.2, 290, 316.1, 325.4, 368.15
1988 063.7, 121.3, 230.7, 234.7, 260, 293.2, 316.3, 316.9
1989 062.35, 132.3, 262.7, 275.1, 275.2, 281
1990 192.2, 272.2, 277.2, 316.14, 323.2, 350.1, 350.2
1990 c. 191.7
1991 127, 156, 276, 277.3, 316.4, 381, 417, 580
1992 009.2, 063.6, 096.4, 096.5, 096.6, 185.1, 258.2
1993 017, 118.4, 202.1, 202.2, 206.2, 382, 481
1994 062.36, 125, 139.2, 203, 303.1, 334.2, 383, 384, 474, 482, 483, 544, 545, 581, 589, 590
1994–1995 288.6
1995 063.8, 088, 245, 303.2, 316.5, 316.10, 330.2, 341.8, 356, 444, 480, 484, 554, 624
1996 034.1, 094, 132.4, 292.7, 316.6, 350.3, 359.1, 359.2, 361.1, 399, 429, 430, 445, 448, 475, 479, 625
1997 184.1, 185.2, 185.2, 270.10, 303.6, 316.11, 395, 499, 592, 593, 614
1998 019, 037.1, 039.4, 087.4, 128.1, 128.2, 128.3, 151.1, 165.3, 190.1, 239, 294.4, 385, 386, 418, 463, 464, 512, 579
1999 019, 027.4, 059.2, 128.4, 128.5, 184.3, 228.4, 258.3, 419, 465, 527, 591
2000 162.2, 310.1, 570

2001 202.3, 202.4, 277.4, 326.1, 351, 355.1, 594
2002 061.1, 303.3, 303.5, 316.7, 326.2, 422, 466, 493, 571, 619
2003 037.3, 039.5, 061.5, 151.2, 184.2, 190.2, 238, 316.2, 316.15, 326.5, 355.2, 361.2, 361.3, 432, 485, 530, 586, 613, 618
2004 028.1, 037.5, 042.41, 061.4, 101, 314, 316.8, 316.12, 316.17, 405, 500
2005 011, 016.1, 016.2, 016.3, 016.4, 062.37, 134, 199.2, 303.4, 326.3, 326.4, 359.3, 414, 621.1, 621.2
2005 c. 061.2
2006 016.5, 037.7, 055.18, 112, 180.8, 202.5, 237.1, 237.2, 322, 359.4, 401, 421, 462, 511, 524, 528, 550
2007 005, 034.2, 047, 061.3, 061.6, 165.4, 178.23, 182.6, 226, 234.8, 515.1, 515.2, 525, 541, 608, 622
2008 022, 037.4, 037.8, 038, 069, 071.1, 071.2, 150.3, 316.13, 362, 363, 402, 441
2008 c. 028.2
2009 103, 113.1, 117, 126.1, 126.2, 310.2, 316.16, 406, 572, 577, 578
2009–2010 133.8
2010 016.6, 037.6, 061.7, 071.3, 113.2, 126.3, 133.9, 199.3, 298.2
2011 037.2

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Authors' surnames containing 'le', 'la', 'van' or 'von' are found under 'L' or 'V' respectively: Le Blanc, Ch. or Von Bartsch, A. Other surnames with the particles 'de', 'zu' and so on are found under the first letter of the actual surname: Jong, M. de or Freudenberg, E. zu. Abbreviations used: c. = circa; ed. = edition, editor; eds. = editors; et al. (et alii) = and others; pt. = part; repr. = reprint; s.a. (sine anno) = without year; s.l. (sine loco) = without place; s.n. (sine nomine) = without publisher's name; vol. = volume; vols. = volumes.

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Name Index

This index is to names of companies, corporations, groups, institutions and persons, including portraits, in the main text. Names of countries and regions can be found in the Subject Index. Surnames beginning van *or* von *are entered under* V, *eg* Van de Velde, Jan; *those starting with* l', la *or* le *are entered under* L, *eg* Le Blon, Jacque Christoph; *and surnames beginning* d', da, de, di, te *and* ter *are entered under the name following, eg* Brugghen, Gerard ter. *Famous artists and nobility are entered under their first names, eg* Leonardo da Vinci *under* L, Margaret of Austria *under* M.
   Note that initials and first names are omitted in company name entries: for Thomas Ross Ltd *see* Ross Ltd.

A

Academia de las Tres Nobles Artes de San Carlos 63
Académie des Beaux Arts 228, 230
Académie des Sciences 139, 214, 230, 361
Académie Royale de Peinture et de Sculpture 85–86, 121–122 n. 164, 304
Academy of Natural Sciences (Philadelphia, USA) 396 n. 854
Academy of Sciences (St. Petersburg, Russia) 138
Accademia e Compagnia delle Arti del Disegno 86, 89
Ackermann 98, 106, 110, 112, 126 n. 308, 126 n. 310, 130 n. 463
Admiralty 119 n. 90
Akua-Kolor 129 n. 433, 382 n. 233
Alauzet & Co. 282, 383 n. 282
Albert of Saxe-Coburg, prince consort (1819–1861) 121 n. 153
Alberti, Cherubino (1553–1615) 233 n. 26
Aldegrever, Heinrich (1502–1555/1561) 53
Aleghieri, Dante *see* Dante
Alembert d', Jean Le Rond (1717–1783) 15, 91
Allard, Carel (1648–1709) 117 n. 36, 347, 349
Alps, Glen (1914–1996) 194
Altdorfer, Albrecht (1482/1485–1538) 53
Altdorfer, Erhard (after 1480–after 1561) 53
Amand Durand, Charles (1831–1905) 192, 230, 256 n. 973
Amat, Miguel (fl. 1695) 63–64
Amelia Elisabetha Landgräfin of Hessen-Kassel (1602–1683) 184
Amerbach, Johann *see* Von Amerbach, Johann
American Colorcraft Company 381–382 n. 232
Anderson, Alexander (1775–1870) 123 n. 199
Apollo Association for the Promotion of the Fine Arts 122 n. 177
Apostool, Cornelis (1762–1844) 152
Arendzen, Petrus Johannes (1846–1932) 217
Arjo Wiggins 112
Arnold 126 n. 308
Arsenius, Ferdinand (fl. 1590–1600) 243 n. 390
Aspruck, Franz (1570/1580–after 1611) 243 n. 421
Asselijn, Jan (1610–1652) 376 n. 53
Atelier 17 8, 90, 123 n. 209, 222, 331, 371, 421
Atelier Contrepoint 123 n. 192
Atelier d'Art 90
Aubert 115, 180
Aubert, Pierre (fl. 1650–1670) 180
Audebert, Jean Baptiste (1759–1800) 350–351, 396 n. 835
Auer, Alois (1813–1869) 226

August the Younger, duke of Braunschweig-Wolfenbüttel (1579–1666) 329, 331
Austin, George Lowell (fl. 1875) 63
Avery, Samuel Putnam (1822–1904) 122 n. 181

B

Bagelaar, Ernst Willem Jan (1775–1837) 220, 274
Bailly, Pieter (fl. 1590–1598) 79, 96, 124–125 n. 247
Baldini, Baccio (c.1436–1487) 15, 31–32, 58
Baldinucci, Filippo (1625–1696) 15
Baléchou, Jean-Joseph (1716–1764) 83
Bank of England 137, 305
Barabé, Pierre-André (fl. 1760–1770) 184, 192
Barbari, Jacopo de' (c.1450–before 1516) 71 n. 64, 157
Barbieri, Giovanni Francesco (Guercino) (1591–1666) 377 n. 60
Barff, Frederick (fl. 1876–1884) 203
Barrault, Gillete (fl. 1566) 129 n. 420
Barth, Carl (1787–1853) 294, 300
Barthomeuf 127 n. 344
Bartolozzi, Francesco (1728–1815) 130 n. 443, 209
Bartsch, Adam *see* Von Bartsch, Adam
Baselitz, Georg (pseudonym of Hans-Georg Kern; 1938–) 239 n. 235
BASF 254–255 n. 917
Basire, James (1730–1802) 148, 260
Baskerville, John (1706–1775) 276 n. 17
Basseporte, (Madeleine-Françoise?) (1701–1780) 382 n. 249
Bastulus *see* Nastulus
Bate, John (fl. 1634) 110, 156, 170
Bate, John (fl. 1832) 226
Baudouin (*née* Boucher), Marie-Amélie (1740–after 1769) 362–363
Baviera *see* Carocci, Baverio dei
Bayard, Émile (1868–1937) 139
Beatrizet, Nicolas (1515–after 1565) 179
Beaugrand, Jean de (1562–before 1618) 84, 121 n. 153
Beaujean the Elder, (...) (fl. 1675–1700) 80
Beaujean the Younger, (...) (fl. 1700–1725) 80
Beccafumi, Domenico di Pace (1486–1551) 12
Bechtholt, Johann (fl. 1575–1600) 401 n. 981
Beham, Barthel (1502–1540) 53
Beham, (Hans) Sebald (1500–1550) 53
Beham, Lazarus (fl. 1476) 366
Behr, Marion (fl. 1990–2010) 223
Behr, Omri (fl. 1990–2010) 223
Bell, Thomas (fl. 1783–1806) 309
Bella, Stefano della (1610–1664) 199, 251 n. 732
Bellange, Jaques (1594–1638) 199
Belleton, Pierre (fl. 1566) 129 n. 420
Benazech, Paul (c.1744–1783) 363
Benoist, (...) (fl. 1760–1770) 60
Benoit, (...) (fl. 1837) 307
Beraldi, Henri (1849–1931) 86, 315
Bergner, Theodore (fl. 1856) 234 n. 71
Berkenboom, Martinus (Mattheus) (1667–1722) 347
Berlinghieri, Francesco (1440–1501) 27, 58, 141, 144
Berres, Joseph (1796–1844) 230
Bersch, Josef (fl. 1880–1925) 274
Berthiau(d), (...) (fl. 1837) 87, 274, 300, 302, 318, 335
Besson, Jacques (c.1510–1573/1576) 60, 314
Bettini, Antonio (fl. 1477) 44
Bewick, Thomas (1753–1828) 242 n. 357
Bibliographisches Institut 81
Bickart, Jodocus (c.1600–after 1684) 245 n. 495
Billettes, Gilles Filleau des *see* Filleau des Billettes, Gilles
Binck, Iakob (after 1500–1569?) 53
Bishop, Thomas (fl. 1879) 204
Black, J. (fl. 1790) 235 n. 100

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

Y

Z

Subject Index

This index is to the main text with a few references to themes in the appendices. Terms such as 'copper plate', 'engraver' and 'printing' appear so commonly that reference is only made to the major paragraphs on the subjects. See also the defined keywords used in Appendix 4, Bibliography of Practical Manuals, pp. 423–428. References to the effects of material and technique on style are omnipresent in the text and therefore not indexed.

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

W

X

Y

Z