

*Printed Book Illustrations
before 1900:
A Grinnell Guide*

Erik Simpson and
Emmelene Perencevich

First Version, 2025

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Introduction:

Three Ways of Putting Ink Here, Not There

Putting ink on a page is easy enough. You can use a pen, or you can take ink from a bottle and spill it directly onto a page. The key to making multiple copies of an illustration, however, is to control the placement of the ink. In other words, you need to have a way of putting the ink in certain places *and not others*, reliably, across multiple impressions of an illustration. In most of the history of print—before the advent of photo-mechanical processes—there have been three main ways to do that: relief printing, intaglio printing, and planographic printing.

With the assistance of this guide, you will develop some basic methods for understanding and identifying those three major techniques of printing illustrations in use before 1900. All of the techniques described here remain in use today.



Figure 1. Detail from a woodcut in Lynd Ward, *God's Man: A Novel in Woodcuts* (1929), Grinnell College Special Collections, NE1215.W3 A4.

Relief Printing

Relief printing is probably the most intuitive of these methods. If you cover your hand—or a block of wood, or a sponge—with ink and make multiple prints on a piece of paper, you have enacted a simple form of relief printing. In book illustration, relief printing usually involves putting ink on the surface of a block of wood that has been partially carved away. Whatever you want to print, you leave uncarved, and you carve away the rest. Inking the uncarved surface and pressing it onto paper will produce the image in reverse, just as placing your inky right hand on a piece of paper will create the image of a left hand facing up.

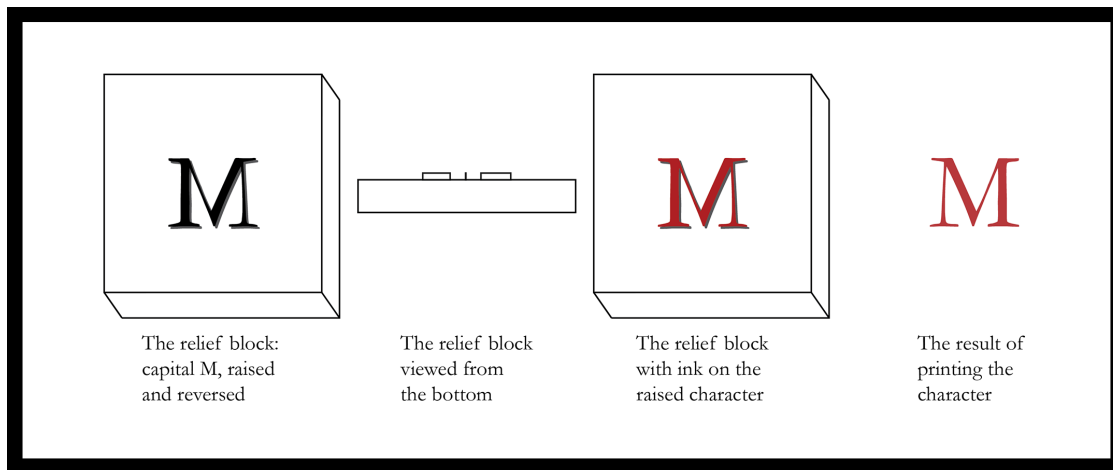


Figure 2. Illustration of relief printing by Erik Simpson.

In terms of our two basic questions, then, we have these answers:

1. How do you put ink in certain places?
Leave those areas of the block uncarved.
2. How do you ensure that ink does *not* go in other places?
Carve away those areas of the block's surface.

Intaglio Printing

Intaglio printing is essentially the opposite of relief printing. (“Intaglio” is an Italian word and therefore has a silent “g” when pronounced.) Both methods begin with a flat surface, some of which is carved away to create a reverse image of the eventual print. In intaglio printing, however, the design to be printed is carved out of the surface in thin lines. Then the inked plate is wiped clean, and the ink sits beneath the surface in the carved lines. The paper and the plate come together with a great deal of force, so that the ink transfers from the carved image to the paper.

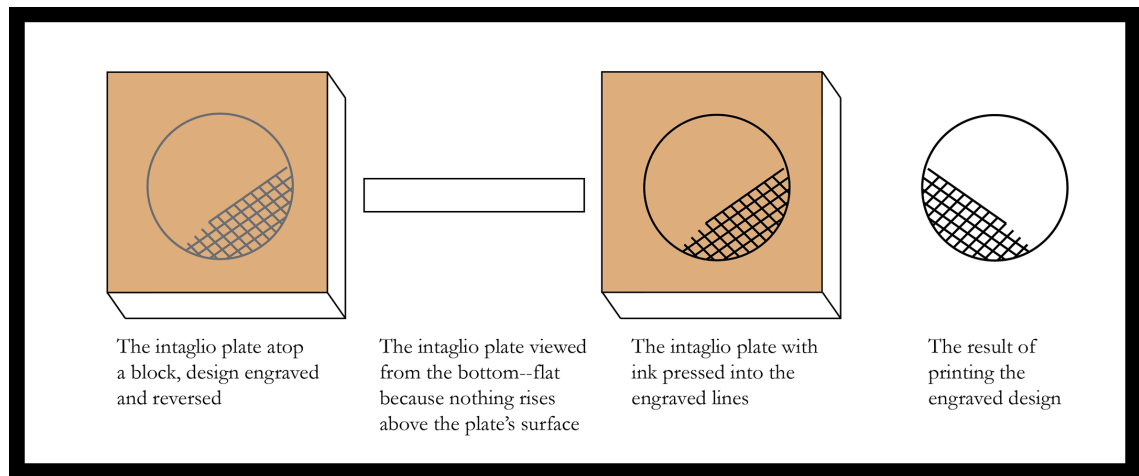


Figure 3. Illustration of intaglio printing by Erik Simpson.

The force required to bring the ink out of the grooves has two major consequences for the intaglio process. First, it requires a strong material to absorb the force; intaglio generally uses metal plates rather than wooden blocks. Second, it requires a press that concentrates extra force on one area of the print at a time; therefore, intaglio generally uses rolling presses, in which the plate passes under a cylinder, which exerts all its force on one part of the plate at a time.

Our two basic questions thus have these answers for intaglio printing:

1. How do you put ink in certain places?
Remove the lines of the design from the metal surface of the plate, then spread ink on the plate so that it sinks into the recesses of the design.
2. How do you ensure that ink does *not* go in other places?
Leave those areas untouched on the surface of the plate, then wipe away the ink.

Identification:

Three Considerations

Many parts of identifying print methods are tricky, but some are not. Here are a few relatively easy ways to narrow down your options.

Chronology

The first question to ask about an illustration you want to identify is simple: when was it printed?

Methods of printing never disappear. Therefore, older books and prints give you an advantage in identification: their makers had fewer options to choose from! Medieval books never had photographs, for example, but people continue to make relief prints with wooden blocks today.

Here is the key to the basics: intaglio methods were developed in the 1400s, and lithography was invented around 1800. The first books with photographs came out in the 1840s.

Therefore, you can use this as a rough guide:

- Was your print made before 1400? It's likely to be a woodcut (relief printing).
- Was it made between 1400 and 1800? It could still be a woodcut but could also be a metal engraving (intaglio printing). As engravings became increasingly able to capture subtle tones of illustration, the ruggedness of woodcuts fell out of style. Woodcuts lost ground to engravings during the 1600s and largely fell out of use in the 1700s.
- After 1800? An illustration could be relief, engraved, or planographic. (Engravings increasingly become made from steel rather than copper in the 1800s.)
- After the 1840s? Photography is also possible.
- Still later? Many kinds of photomechanical methods become possible.

Impressions and Platemarks

The other quick way to narrow your options is to look for evidence of the pressure made on the paper by the press. In this case, you look primarily at the *back* of the image and ask this question: does the paper reveal pressure marks shaped by the contours of the image? Or does it show the outlines of a printing plate of a regular shape, usually a rectangle?

If you can make out the irregular contours of the printed image itself, you are probably looking at a relief print. In relief printing, the design itself makes contact with the paper, so the back of the paper sometimes shows the light outlines of the illustration's shape.

The more common telltale impression, however, is that of the platemark, meaning the rectangular impressions made by the edges of the metal plates. The plates, of course, are larger than the printed areas themselves. Platemarks are often easier to detect than relief impressions because intaglio printing requires more pressure to transfer the ink onto the paper. In the image below, the platemark surrounds the border of the illustration as well as the caption, so you can tell that both elements were part of a single printing plate.



Figure 5. Image showing a clear platemark surrounding a printed illustration and caption. *A Meteor Shower in the Night Sky*. Mezzotint after H. Robinson (1783). Source: [Wellcome Collection](#).

Evidence of Cutting Methods

This method adds one more step of indirectness. Rather than examining the print for evidence of how the source image made contact with the paper, we look for evidence of how the cutting instrument created the source image. These observations often require a magnifying glass.

The lines of woodcuts are often uneven because relief printing involves cutting away the outside of a line rather than cutting the line itself. When examining magnified lines, cleaner edges imply indicate intaglio methods, whereas wobbles may indicate a relief process.

This point about uneven lines has a special application to cross-hatching, the process of creating the effect of shaded areas by creating two sets of crossed lines: a set of roughly parallel lines running in one direction, crossed by a set of roughly parallel lines running in another direction. The cleaner lines of intaglio plates will create relatively neat diamond shapes where these lines intersect. In relief printing, however, each of those small, uninked spaces needs to be carved directly, so their shapes are rougher and more varied.

To determine whether an intaglio print was created by engraving or etching, look at the shape of the black lines of the print. In an engraving, the burin begins a cut on the surface, goes deeper into the plate in the middle of the cut, then rises again to the surface. Therefore, the line created by engraving tends to have pointed ends and a wider middle. Etched lines, however, have a more consistent width, rounded ends, and a bit more unevenness through the line.



Figure 6. Detail from a woodcut illustration in Stultifera nauis mortalium [The Ship of Fooles] (1572), Grinnell College Special Collections PT1509 .N34 1572. As a relief technique, woodcut allows printing substantial forms of uniform black, with the white space cut away. The lines show the varied thickness of the cuts.

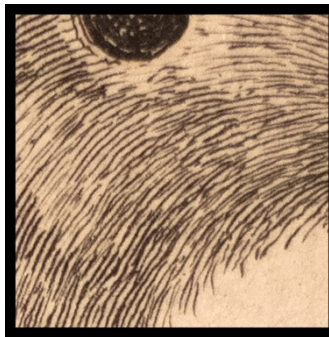


Figure 7. Detail from an engraving in Gilbert White's The natural history and antiquities of Selborne (1789), Grinnell College Special Collections QH138.S4 W5 1789. The engraver's tool creates thin, precise lines, but if you look closely, you can see that they narrow at the ends, where the tool is entering and leaving the surface of the metal plate.



Figure 8. Detail from an etching in Henry Fielding's A Journey from This World to the Next (1930), Grinnell College Special Collections PR3454 .J8 1930. The etched lines have a narrowness and precision similar to those of the engraving--both are intaglio methods. However, the etched lines maintain a similar thickness throughout, with rounded rather than pointed ends.

Summary Chart

	Relief: Woodcut	Intaglio: Engraving	Intaglio: Etching	Lithography
Chronology	Dominant before 1600, decreasing until 1800, less common thereafter except for artistic/retro applications	Introduced in the 1400s, rises slowly and becomes dominant through most of the 1800s, less common afterwards	Introduced in the early 1500s, rises along with engraving and becomes a favorite technique among painters	Introduced in early 1800s
Impressions and platemarks	Less pressure involved, so no sign of impression or, if any, pressure in the shape of the printed image itself	More pressure involved, so signs of the rectangular outline of the printing plate	More pressure involved, so signs of the rectangular outline of the printing plate	Given the flat printing surface, no indentations on the back of the print
Cutting methods	Uneven lines, rough and irregular shapes in cross-hatching	Clean lines, relatively regular diamonds created by cross-hatching; lines pointed at ends and swelling in the middle	Clean lines, relatively regular diamonds created by cross-hatching; lines rounded at ends, with consistent width throughout	No cutting—characterized by the flatness of the print, even when the markings suggest other styles

A Note on Reproductions

The illustrations in this guide send an important message. They claim to show you the characteristic marks of different kinds of hand-press printing, but, of course, none of them are printed on hand presses. Instead, they are all photographs, reproduced in digital documents or by inkjet or laser printers. Many kinds of printing, in fact, can reproduce the characteristic effects of other kinds of printing—sometimes for purposes of deception but more often, as in this case, simply to reproduce images without needing to re-create the whole process of design and printing that made the first versions. When identifying prints, always have in mind the possibility of later reproduction.

Sources and Further Reading

See the Bibliography for full citations.

Gascoigne, *How to Identify Prints*.

Ivins, *How Prints Look*.

Wakeman, *Graphic Methods*.

Werner, *Studying Early Printed Books*, 69-71.

Woodcut (Relief Method)

Creating a woodcut involves removing parts of a block of wood so that all that remains of the surface is the image to be inked and printed. Because the side grain of a wooden block is not dense enough to retain highly detailed cuts, woodcuts often have simpler lines than engravings, producing a more rugged appearance.

History of Woodcut Printing

The oldest method of printing many copies of the same image, woodcut printing dates back at least to the 700s in Japan, with other early instances also occurring in China. Chinese relief printing had been active at a large scale for centuries while Europe's textual production remained in manuscript. Printing technology spread in the 1300s and 1400s to many other places, including Continental Europe. Artists developed increasingly sophisticated techniques for capturing expressive detail; one key advance in such virtuosity came in 1498, with the publication of the German Albrecht Dürer's *Apocalypse*, illustrating the Biblical Book of Revelation. In 1510, Hans Burgkmair used a chiaroscuro (Italian for "light-dark") method to add blocks of color to the traditional black lines of woodcut. Even as Gutenberg's metal movable type moved into wide use, European books continued to combine woodcut illustrations with the new ways of printing text.

Woodcuts were used in manuscripts and gradually replaced hand illustration for its convenience. One advantage of woodcut printing in the hand-press era is that the woodcut can be cut to the same height as type, then locked in the same forme as movable type for printing. (Intaglio illustrations, by contrast, need to be created in a separate press and combined with relief-printed text.) Illustrations could be incorporated into the mass production of text, either as the type was run through the printer or afterwards. Furthermore, woodcuts could be (and often were) reused, either within a single book or across multiple books. These practical advantages helped woodcuts retain their dominance as the main method of illustration for centuries, but in western printing, they fell out of favor as the publishing industry shifted mostly to engraving methods in the 1600s and 1700s. In some areas of Asia, notably including Tibet, entire books were created from woodblocks of text and images in a process called xylography. That practice remained the primary means of book production much later than the period of woodcuts' dominance in western printing, and it continues to the present day.



Figure 6. Woodcut illustration in *Stultifera nauis mortalium* [The Ship of Fools] (1572), Grinnell College Special Collections PT1509 .N34 1572



Figure 7. Woodcut in Lynd Ward, *God's Man: A Novel in Woodcuts* (1929), Grinnell College Special Collections, NE1215.W3 A4.

How Woodcut Works

Woodcut or woodblock printing begins with blocks cut from the side grain (the plank edge or along the grain) of wood. The wood is cut, planed, and polished to the correct height for printing. The image can be drawn onto the surface of the block directly or drawn (or brushed) onto paper and transferred to the block. In any case, the white areas—the negative space—of the image is then carved away, leaving the positive space of the image itself to be inked and printed.

Sources and Further Reading

See the Bibliography for full citations.

Gascoigne, *How to Identify Prints*, sections 5, 21-22, 47a, 52a, 53e, 55b and t, 75a and b, 80a.

Houston, *The Book*, 175-198.

Ivins, *How Prints Look*, 5-22.

Wakeman, *Graphic Methods*, “Woodcut” (folio 1).

Werner, *Studying Early Printed Books*, 65-66.

Wood Engraving (Relief Method)

The phrase “wood engraving” is misleading: engraving on wood is a relief process, unlike the intaglio method used for metal engraving. The method is called “engraving” because the dense end grain of the wood allows the printmaker to use engraving tools rather than the knives used to make woodcuts. The resulting prints therefore have thin lines and subtle effects resembling those of metal engravings.

History of Wood Engraving

Wood engraving developed in the late 1700s as a hybrid form combining the long-established practices of woodcuts and metal engraving. Thomas Bewick, an English engraver and natural historian, popularized and refined the technique.

Bewick employed an engraver's burin (or graver) instead of knives. In wood engraving, the burin and hard end-grain blocks allow for more intricate and detailed images. Bewick is most famous for the engravings in his *History of British Birds*, which debuted in 1797 with a volume on land birds (Grinnell Special Collections QL690.G7 B5 1797). The illustration below, however, comes from Bewick's engravings for the *Fables of Æsop*, so you can see that Bewick also created a very fine elephant.

How Wood Engraving Works

The end grain blocks used in wood engraving limit the printmaker to a smaller surface, so larger wood engravings are sometimes made by joining multiple blocks.

Fundamentally, however, wood engraving is a variation of woodcut printing. In both cases, the design is left (in reverse) on the surface of a piece of wood, while the negative space is carved away, and then the printer uses a relief method to apply the ink to the wood and then to paper.

From a distance, or without a magnifier, wood engraving poses a unique challenge to identification. As a relief printing method, it can resemble a very intricate woodcut print or a metal relief. As a method involving carving by engraving tools, however, its level of detail might mislead you into perceiving an intaglio process. Careful examination with a magnifying glass will generally reveal signs of the relief method.

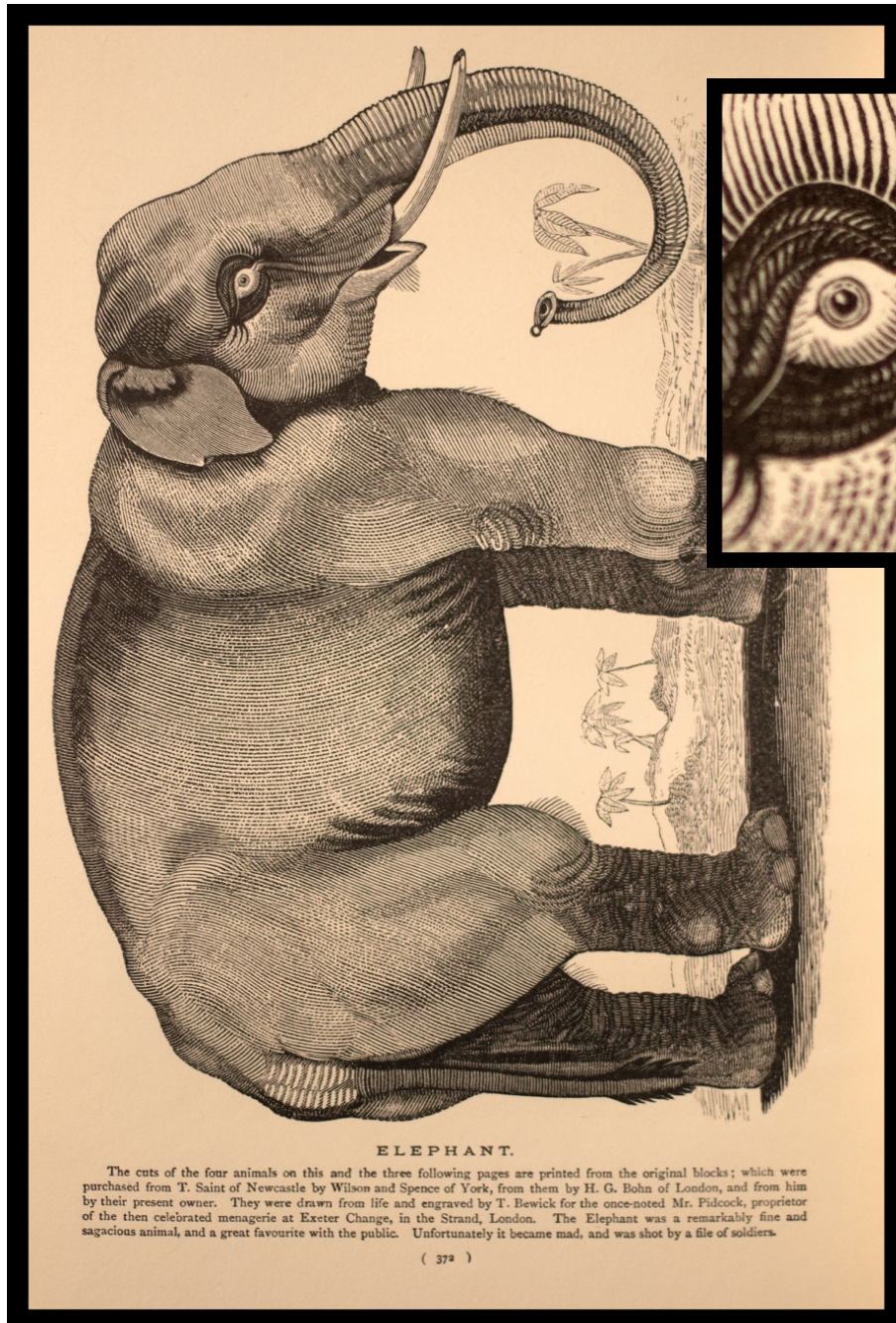


Figure 8. Image and detail from Thomas Bewick's wood engraving in Bewick's Select Fables of Æsop and Others (1879), Grinnell College Special Collections PA3855.E5 B4 1879.

Sources and Further Reading

See the Bibliography for full citations.

Gascoigne, *How to Identify Prints*, sections 6, 23, 47a, 52a, 53f, 55b and c, 75d-f, 80a.

Houston, *The Book*, 214-18.

Ivins, *How Prints Look*, 28-43.

Wakeman, *Graphic Methods*, “Wood Engraving” (folio 2).

Metal Engraving (Intaglio Method)

Engraving involves carving lines out of metal with a tool called a burin. Engraving is an intaglio process, which means that the image is carved away from the surface of the metal plate, and then the carved lines are filled with ink. The ink is transferred to paper by means of a rolling press, which can apply the necessary force to push the paper into the grooves of the plate and thereby extract the ink.

History of Metal Engraving

In the early history of European printing with movable metal type, woodcuts had the advantage of locking into the same formes as the metal type, so that a page containing text and one or more images could be printed in one pass. However, the woodcuts had disadvantages, including their relative inability to capture intricate detail and their tendency to wear down faster than metal type.

During the 1400s and 1500s, European printers began using copper plates for the images, trading the convenience of using the same press as they used for type for the greater subtlety and durability of metal plates, even though the plates required printing in a separate press—and sometimes in a separate print shop entirely.

The transition to metal plates was gradual, however, as they required a great deal of skill to print consistently. In the 1700s and 1800s, engraving and etching took hold as the dominant forms of book illustration until photography and offset lithography came into wide use.

How It Works (Standard Burin Engraving)

The engraving process begins with a smooth metal plate. The engraver puts the design on the plate—by tracing, drawing directly, using an etching needle, or some other method—and then using the burin to incise lines into the plate. The burin cuts away and displaces the metal. (The plate sometimes needs to be cleaned during the process to remove the displaced metal; those shavings are called burrs.) The burin has a v-shaped point, so it creates narrower lines with pressed lightly into the surface of the metal and wider lines as the engraver applies more pressure. That variable width is one of the trademark effects of engraving and of the keys to identifying its use in prints.

Once the engraving is complete, ink is applied to the entire surface of the plate using a soft cloth, hard card, roller, forcing the ink into the incised lines. The excess ink is carefully wiped off the smooth surface of the plate, leaving ink only in the engraved lines. Dampened paper is placed against the inked plate, and both pass through a printing press in which a cylinder applies high pressure in a narrow line that moves from one side of the plate to the other as it rolls over the flat surface of the plate.

Because intaglio engravings are printed with a rolling press, they cannot be combined with movable type (a relief printing technology) in the same forme. To combine movable type and intaglio images, a printer—or multiple printers—would need to use two methods, either by printing the same sheet sequentially on two different presses or by inserting the intaglio illustrations on separate pages within a book otherwise printed in relief.

The engraving reproduced below comes from Grinnell's copy of the first edition of Gilbert White's *The Natural History and Antiquities of Selborne*, which has a kind of cult following among fans of illustration and ecology, and which has never gone out of print since its publication in 1789.

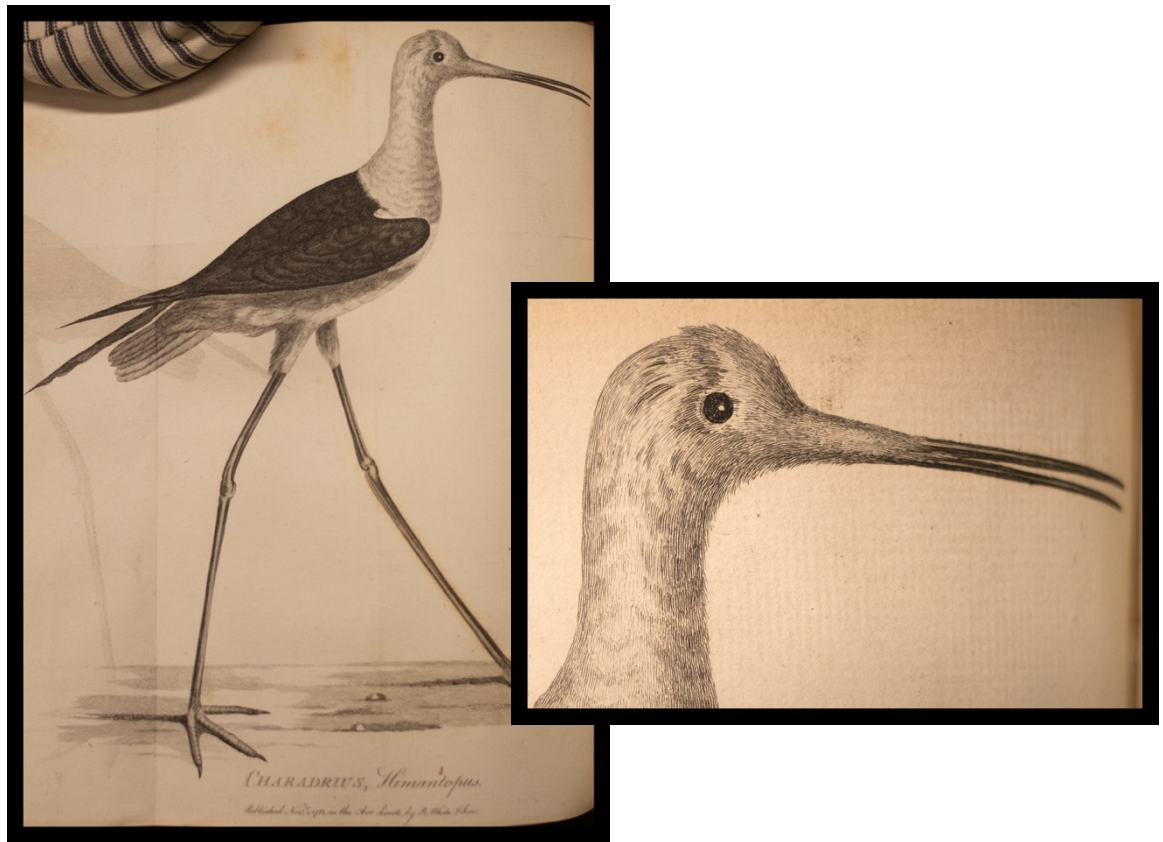


Figure 9. Image and detail from Gilbert White's *The natural history and antiquities of Selborne*, in the county of Southampton (1789), Grinnell College Special Collections QH138.S4 W5 1789.

How It Works (Variations of Engraving)

Aquatint

Aquatint was discovered in the 1600s and used mainly in the period from 1770 to 1830. Aquatint involves first engraving the basic shapes of the print, then using a powdered resin to cover the surface with tiny, white, acid-resistant dots. The artist then adds layers of varnish, reversing the usual effects of layering: the first coat creates the brightest tones (by revealing more of the white base layer), and subsequent layers create increasingly darker tones. The technique allows for rich colors produced in a finely stippled texture.



Figure 10. *Aqueduct near Belgrade*. Coloured aquatint, 1809. Source: [Wellcome Collection](#).

Drypoint

Drypoint may be the simplest method of intaglio printmaking. Rather than using a burin to displace metal, drypoint uses a sharp needle or stylus to scratch lines directly into the metal plate. Therefore, the “burr” of the cut metal remains on the sides of the incisions, allowing the cuts to hold more ink than they would if they were engraved with a burin. Holding the ink creates a kind of velvety blackness in the lines. The burrs of drypoint are delicate, smoothing out in use, so prints have increasingly soft lines as the drypoint plate is used repeatedly.



Figure 11. *Patients wait in the outpatients' department of a hospital.* Drypoint by D. Thorne. [Wellcome Collection](#). Source: Wellcome Collection.

Mezzotint

Mezzotint involves using a tool to roughen the entire surface of a metal plate, raising a light burr that would hold ink and print black over a broad surface, rather than just in the grooves produced by other kinds of engraving. Smoothing parts of the surface created the image in contrasting lighter tones, giving the resulting prints a textural smoothness. Mezzotint is unusual among engraving techniques in starting with a dark surface and then lightening, rather than the other way around.



Figure 12. Image and detail from *A Meteor Shower in the Night Sky*. Mezzotint after H. Robinson, 1783. Source: [Wellcome Collection](#).

Photogravure

The “photo” in photogravure represents its relationship to light, not to photography, which photogravure predates. Photogravure involves etching a plate by covering it with a light-sensitive ground, covering it with a transparency with the design marked in opaque lines, and exposing the whole to sunlight. Photogravure was invented in the 1820s but became common at the end of the century, especially with the invention of tone photogravures, which used photographic images to create plates that could then reproduce photographs in multiple prints.



Figure 13. *A Barber Who Is Also an Artist Neglects a Seated Customer Whom He Was Shaving, in order to Discuss One of His Paintings with a Potential Purchaser.* Photogravure (1882), after F.A. Grison. Source: [Wellcome Collection](#).

Stipple

Stipple engraving is a process of intaglio printing—either engraving or etching—that uses many small dots to create the image rather than the longer lines characteristic of other methods. Stipple developed in the 1700s and enjoyed its greatest popularity around 1800, especially in printing portraits.

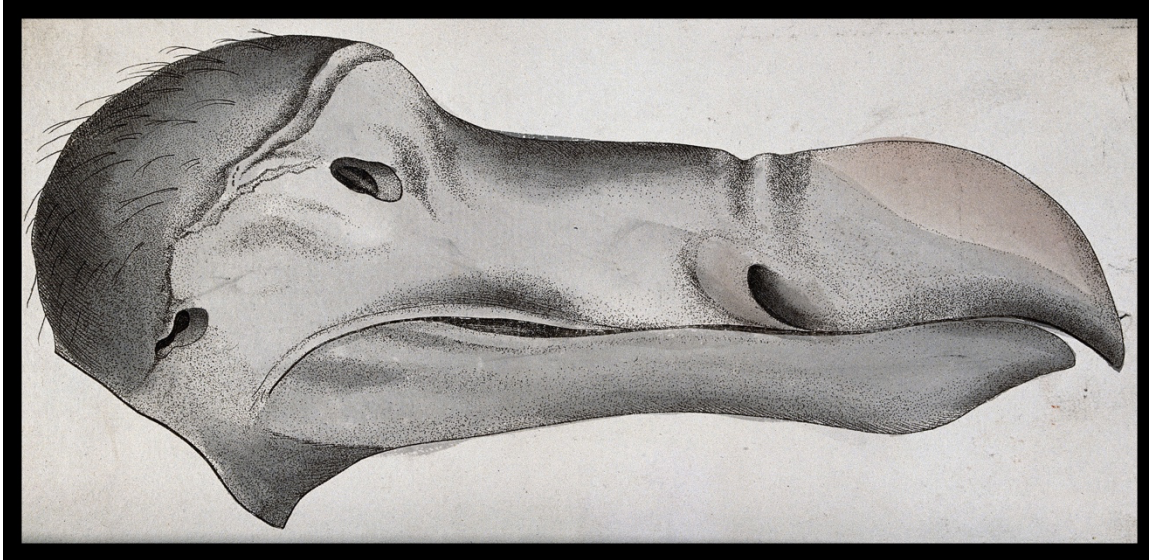


Figure 14. Image and Detail of *The Head of a Dodo*.
Colored Stipple Engraving. Source: [Wellcome Collection](#).



Sources and Further Reading

See the Bibliography for full citations.

Barker, Elizabeth E. "The Printed Image in the West: Mezzotint." In *Heilbrunn Timeline of Art History*. http://www.metmuseum.org/toah/hd/mztn/hd_mztn.htm

Gascoigne, *How to Identify Prints*, sections 9, 11, 12, 14b, 16, 17, 26, 37, 38, 39a, 43, 51-55, 57d and e, 63a, 74b, 75, 77, 80b.

Houston, *The Book*, 202-210.

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Ivins, *How Prints Look*, 44-102.

Thompson, Wendy. "The Printed Image in the West: Drypoint." In *Heilbrunn Timeline of Art History*. http://www.metmuseum.org/toah/hd/drpt/hd_drpt.htm

Thompson, Wendy. "The Printed Image in the West: Engraving." In *Heilbrunn Timeline of Art History*. http://www.metmuseum.org/toah/hd/engr/hd_engr.htm

Wakeman, *Graphic Methods*, "Copper Engraving" (folio 4), "Stipple Engraving" (Folio 5), "Steel Engraving" (Folio 6), "Mezzotint" (Folio 8).

Werner, *Studying Early Printed Books*, 66-68.

Metal Etching

(Intaglio Method)

Rather than using a sharp tool to carve a metal plate mechanically, etching uses acid to burn away the design. After that point, the intaglio printing process is similar to those of the engraving methods described earlier.

How It Works

Etching uses acid to carve into metal by protecting what you do not want etched away with a waxy, acid-resistant “ground.” After the entire surface of the plate is treated with the ground, the etcher uses a needle to scrape away the ground in the reverse image of the shape of the design to be printed. The whole plate is then submerged in an acid bath, and the acid eats away the unprotected metal, forming the design in the plate. Water washes away the acid, the ground is dissolved by a solvent, and the plate is ready for inking. The artist applies ink to the whole plate, then wipes away the ink on the unetched surface. Printing requires a lot of pressure and often a softened or dampened paper to reach into the etched grooves and absorb the ink. Steel plates can withstand that pressure for more printings than can softer metals such as copper or zinc.

Scraping away the wax is easier than carving away the metal itself, so it is more possible for an artist to draw freehand designs in an etching process than in an engraving. In etching, the artist can control the width of lines in two ways: either by etching the same line multiple times to make an individual line deeper, or by leaving the whole plate in the acid bath longer to deepen the lines of the entire design.

History

The technique of using chemical etching rather than mechanical carving developed among German armorers around the year 1500, and the Dutch printer Lucas von Leyden applied the technique to copper printing plates. The delicacy of the etching needle allowed artists to draw directly on plates, rather than relying on an engraver to interpret their work. Etching reached a height of virtuosity and fame in John James Audubon’s celebrated (and gigantic) illustrations of *Birds of America* in the early 1800s. The plates of Audubon’s work involved interpretations of his paintings by Robert Havell, Jr., who combined engraving and etching in an aquatint technique to create subtly shaded images

that could then be hand-colored. Audubon's work represents a pinnacle of pre-lithographic intaglio technique.



Figure 15. Copper etching (by Denis Tegetmeier) and detail from Henry Fielding's *A Journey from This World to the Next* (1930), Grinnell College Special Collections PR3454 .J8 1930.

Sources and Further Reading

See the Bibliography for full citations.

Gascoigne, *How to Identify Prints*, sections 10, 15, 18d, 49b, 51b and e, 52c, 53g, 55e, 55f, 55k, 60a, 80b.

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Wakeman, *Graphic Methods*, "Etching" (folio 3), "Aquatint" (Folio 6).

Werner, *Studying Early Printed Books*, 67-68.

Lithography (Planographic Method)

Lithographic/planographic printing is neither relief nor intaglio. It does not involve carving the plate or block at all. Rather, the design you wish to transfer is *drawn* onto a treated stone in reverse of how you would like to see it printed.

How It Works

In lithography, the image is drawn or painted with greasy materials onto the smooth surface of a stone. A chemical process solidifies the greasy image. Then the surface is rinsed off and dampened with water. The plate is inked, and the watery, smooth surface resists the ink, while the original greasy image attracts it. This, the ink retraces the original image. The print is made by putting paper on the inked stone and running them both below a scraper bar that applies intense pressure to the stone-paper interface.

Identifying lithographs can be tricky. They often look like engravings or etchings in many ways. However, they will not have platemarks, since the scraper bar will normally extend past the edges of the paper, applying consistent pressure across the whole sheet. Also, intaglio prints will often have ink slightly raised above the surface of the paper, whereas lithographic images will be smoother. The lines of lithograph images may resemble the lines that pens or crayons would produce on paper, since the marks are actually made with pens and crayons on the lithographic stone.

History

In the late 1700s, Alois Senefelder discovered what became known as lithography while experimenting with different printing methods. In search of a cheaper alternative to copper plates for practicing his craft, he turned to the stone he had used to roll out his inks, and he began to mark the stone directly. Over the ensuing years, Senefelder worked out the details of the process described above, a way of producing precise prints based on the mutual repulsion of oil and water.



Figure 16. Prang's Aids for Object Teaching,
Lithographer (1874). Source: [National Gallery of Art](#).



Sources and Further Reading

See the Bibliography for full citations.

Gascoigne, *How to Identify Prints*, 19, 20, 27, 28, 41, 44, 50d, 52-55, 59c, 60b, 63, 80c.

Houston, *The Book*, 219-226.

Ivins, *How Prints Look*, 103-118.

Wakeman, *Graphic Methods*, “Lithography: Chalk Style” (folio 9), “Lithography: Line Style” (folio 10).

On Reading Color

Hand Coloring

Early prints—those made before 1830—that have color are likely to have been colored by hand. Even when color printing of intaglio plates became possible, it was difficult, as it involved a painstaking process of re-inking parts of the same plate in different colors. Therefore, hand-coloring persisted even into the age of color printing.

Color printing and hand-coloring can look very similar, so identification involves looking closely at mistakes—at the places where the color does not line up exactly with the shapes it is meant to fill. Such mistakes can happen in any method of applying color. In machine-coloring, however, the mistakes will happen in the same way; for example, all of the green ink will appear slightly to the right of where it ought to. (This kind of mistake is a problem with registration, or the process of aligning the layers of a print to one another.) In hand-coloring, by contrast, the small errors of alignment will be irregular. The color might shift to the right in one case, to the left in another, and so forth.

Methods of Color Printing

Color printing in volume started in the 1830s and became important to the book trade by the 1850s. Color printing could involve any of the standard substrates for printing, including wood blocks, metal plates, and smooth stones. In these early incarnations, color printing functioned by creating multiple surfaces, each to be colored with a different ink, then printing in layers to create the overall effect of color from the mixed and juxtaposed hues.



Figure 17. Edmond Amand-Jean, *La Rieuse: Madame Albert Besnard (1897)*, color lithograph. Source: [The National Gallery of Art](#).

Sources and Further Reading

See the Bibliography for full citations.

Gascoigne, *How to Identify Prints*, sections 9, 12-14, 28, 47c, 49b, 52b, 53g, 54, 55e, k, and s, 77, 80b and c.

Houston, *The Book*, 226.

Wakeman, *Graphic Methods*, “Chromolithography” (folio 11), “Hand Colouring” (folio 13).

Appendix:

Overview of Later Methods

The first book illustrated by photographs was William Henry Fox Talbot's *The Pencil of Nature*, published in 1844. Photographic techniques developed throughout the 1800s to improve the clarity and durability of the images.

Houston 231: "If you have read an illustrated book, newspaper, or magazine printed between 1880 and 1960, then you have almost certainly seen halftone relief printing at work."

The key development for contemporary book printing is photolithography, which places a photographic negative onto a sensitized lithographic plate, often made of zinc or copper. This process combined with color half-tone printing around 1900, resulting in a powerful process of reproducing any kind of image or text. (Half-tone methods create small dots that are generally detectable with the naked eye or with the assistance of magnifiers.) Modern books are often made through photolithographic processes, which use light to control ink directly.

Fully photographic composition—of type as well as images—took hold with the development of the Intertype Fotosetter in 1946. Many other innovations followed, but the key to all of them was the ability to combine words and images in a method compatible with lithographic printing. In the last decades of the 1900s, digital computing took over the functions of composition, allowing a range of effects and flexibility unimaginable in letterpress printing based on physical type and image blocks. Those digitally composed pages, of course, can now be delivered to screens electronically, bypassing paper and ink entirely to produce books in the medium of light.



Figure 18. A Monday Washing, New York City, photo-chromolithograph published by the Detroit Photographic Company (1900). Source: [National Gallery of Art](#).

Sources and Further Reading

See the Bibliography for full citations.

Gascoigne, *How to Identify Prints*, section 41.

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