

Map Printing Techniques

An Introductory Note

Admit it. You have probably used and thrown away dozens of maps in your life—the sketch on a napkin that helped you to a party, the park map after vacation, the atlas that disintegrated under the back seat. But those were tools that helped you make spatial sense of the world! They helped you synthesize distance and observation! That's what maps do, after all. Consider a different situation. You are in a print storage room, looking at a map. It shows California as an island. European 17th- and 18th-century maps often depict California as an island. The image is old, but is the map old?

Many museums have maps in their collections and archives. In these collections old and modern maps are sometimes stored in the same drawer. It is important that museum staff responsible for the care and preservation of map collections be aware that there are old maps in park collections. A single characteristic of maps—print technique—will be discussed in this article. This is just the tip of the iceberg when it comes to learning about old maps. The goal of this article is to make you aware of the fact that there are old maps in many museum collections. If you are responsible for a map collection and it contains a map with the old print characteristics shown in this article, place it in an archival quality folder. If the map turns out to be a facsimile (a modern map that intends to deceive by imitating the paper, size and lines of an old map) you have made an error, yes. But you have erred on the side of caution and that's good. We will not discuss reproductions because they are modern maps that are not made with the intention to deceive; they don't even look old.

Connoisseurs can spend their entire lives learning about old, original maps. That knowl-

edge is based on hundreds of hours carefully examining maps. The watermark, paper color, and texture can reveal information. A mark or stamp that might not even be noticed by the amateur could be a collector's mark and prove important. Even damage can tell a connoisseur about the history of a map. For instance, a cut edge could result from the map being removed from a book. This is a complicated field and this article will not attempt to summarize cartographic connoisseurship. What it will do is explain the basic differences between three important printing techniques that have been used over the past five centuries for making maps. Two will be found in old maps and the third is a technique found only in 20th-century maps. The characteristics of the printing processes described here are visible under magnification. A 10X power lens should be sufficient. A hand held magnifying glass is best because nothing is placed on the surface of the map. Be sure to look at several areas of the map to make sure the characteristics you see are visible throughout the image.

Don't ignore the antiquity of maps in collections. If a mistake is made in identifying a modern facsimile as an antique map (and extra care is taken for it), that is better than treating an antique map in the same casual way as those sold in the gift shop. If a map might be old, place it carefully in an archival quality folder.

Historically, there were only three ways of pressing ink onto paper: relief, intaglio and planographic. The relief method presses ink onto paper from the tops of the ridges in a block; examples are woodcut prints, linocuts and letterpress. The intaglio method presses ink onto the paper from the bottom of troughs made in a plate; examples are engraving and etching. The

planographic method presses ink onto paper from a flat surface; lithography is an example.

Process/History/Technique

Woodcut. This is a relief printing process and is the oldest printing technique known. Early on it was used for printing designs on textiles, playing cards, and religious prints. In Europe, it flourished in the 15th and 16th centuries where it was used in books printed with movable type.

The white areas of the design were cut out of a plank of wood with very sharp tools, probably knives and chisels. The plank was cut in the grain direction and fruitwoods, beech, and sycamore were used. The map was either drawn directly on the block (reversed) or transferred onto it. All the work had to be done skillfully because once the design was cut it was very difficult to make changes. If a change was necessary, a piece was cut out of the block and a wooden plug inserted.

A “wood engraving” is different from a woodcut because the image is made by cutting on the end grain surface. A sharp tool, the burin, could achieve very fine lines when used to cut the design into the end-grain. Wood engraving was popular in the 19th century.

Engraving. This is the oldest intaglio technique. Engraving had been done to decorate metal for ages. The process of making images by engraving a copper plate, filling the lines with ink and pressing it onto paper started in the 15th century and it was the most important map making technique until the 19th century. The advantages were that more and larger maps could be printed from a copper plate than from a woodcut and finer lines could be made.

Revisions were also easier to make.

The plate was a flat, polished sheet of copper and the map drawing (reversed) was transferred onto the plate in a variety of ways. A highly skilled craftsman, the engraver, used a burin to cut the lines into the copper plate. Revisions could be made by raising the selected area, smoothing it and engraving the plate again. To print the map, the whole plate was covered with ink and then wiped carefully

clean, leaving ink in the lines. It took a lot of pressure to transfer the ink to the paper and this was accomplished in the press.

Lithography. Unlike the previous techniques, we do know who invented lithography: Aloys Senefelder, in Munich, in 1798. Senefelder referred to the process as “chemical printing.” He used the repelling properties of grease and water to print from polished slabs of very fine textured limestone. He promoted his new printing process and news of it spread rapidly. Images could be made easily with lithography and many more prints could be made in this process than had been possible with woodcuts or copper plates. The demand for inexpensive maps in the U.S. was met by stone lithography during the 19th century. For the entire 20th century, however, offset lithography has by far been the dominant form of commercial printing, which includes maps.

The limestone attracted water and grease equally making this planographic technique possible. When the stone was inked, the ink was repelled by the water and would only adhere to the greasy drawing media in the image areas. In a press, the ink was transferred to a sheet of paper.

The same chemical properties work on special metal plates and these are most commonly used in the indirect lithographic process called “offset” lithography. In this technique the inked image is transferred to a rubber cylinder that presses the ink onto the paper. In offset lithography the image does not have to be drawn reversed and thousands of prints can be made an hour.

Identification

Woodcut. The appearance of woodcut lines (below) is a result of the tools and materials used

Magnified example of woodcut print.



Magnified example of offset lithographic process.

to make the print block. For instance, a knife cut in a resistant material will usually be straight and sometimes slip. This results, in the print, in angular lines of uneven width. The ends of the lines tend to be square. Small round circles and letters are impossible. This medium is not well adapted to smooth, tight, gracefully turning lines. The woodcut print is characterized by a squarer, more severe and simpler looking image. In addition, the woodcut line was relatively fragile and could break after many printings, resulting in white breaks in the lines. Because the wooden lines are pressed into the paper, the ink can be thicker at the edges of lines and the lines can be embossed slightly on the back of the paper.

Engraving. The engraved line (below) will be pointed where the burin is inserted into the metal and blunt where the tool is removed. The engraved line can be very fine, graceful and curved but it cannot be loose or playful because the force of mechanically cutting

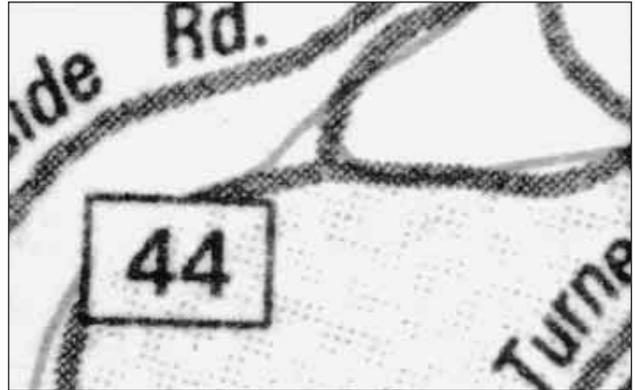


Magnified example of engraving.

the plate makes a casual or quick drawing style impossible. Shaded and dark areas are made with crossed lines, called cross-hatching. Solid, black, wide lines are impossible with this technique. Large, wide letters are made by cutting lines immediately adjacent to each other. Because the ink is deposited from troughs in the plate, heavy lines will be raised slightly above the paper sur-

face. If the paper has not been cut down, there will be a platemark.

Lithography. Photography has made lithographic processes the most problematic printing



techniques to identify. Facsimiles of woodcuts and engravings have been made using lithography. However, this is a planar technique and the ink will always lie evenly on the paper. In offset lithography, seen magnified above, the image is made of tiny dots that have soft edges and merge in dark areas. Both black and color inks have this characteristic.

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Photos courtesy the author.

There are many variations of relief, intaglio and planographic printing methods. Only three were discussed here because, over the centuries, these three printing techniques were used more than any others to make maps. Books have been published about print making processes and maps. Two recent publications are *Collecting Old Maps*, by Francis J. Manasek, (1998) Terra Nova Press, Norwich, Vermont, and *How to Identify Prints*, by Bamber Gascoigne, (1986) Thames and Hudson Inc., New York, NY.