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(FCT 2020.09546.BD.)

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Specimens of lithograph stone and prints displaying the step by step process of the manner of etching on stone

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various dimensions of stones and prints on cotton paper

Research projects:
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Manuals used for teaching lithography today often fail to mention the technical variant of line engraving or etching on stone. The elevated manner[1] prevails instead, created by Senelfelder himself. The manner of Etching on Stone[2] belongs to the "engraved" category in which Senefelder grouped lithography with aquatint as well as soft-ground.

Several historians fairly note that in the 19th century there was an initial resistance in adopting lithography in most printing establishments as people couldn't help but to compare intaglio and printing from stone, especially when it came to discussing printed work such as maps or plans, material that required very precise lines and fine details. (Jomard, E.F. (1826, 1st of July)). Walter Ristow also makes the argument that initially there wasn't a clear understanding of what the technical definition for lithography should be: sometimes the stone would be etched or engraved to emulate either relief or an intaglio print. (Ristow: Woodward, 1975, p. 78 quotes Twyman, 1970, p. 64).

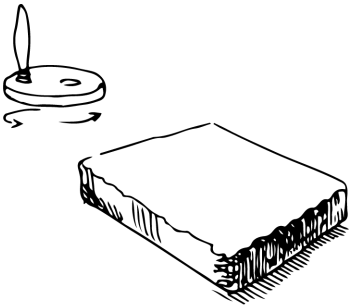
In the late 19th-century, we started to notice a wider acceptance of the use of lithography in the etching manner for commercial printing. As Charles Lorilleux said, "there are more people used to engraving than to write, and most writers know to manipulate the burin, the metal or the diamond point". (1889, p. 62). Practicality was a factor, but the main one was the economic standpoint, which pointed towards a general preference for lithography. Grandidier, for example, shows how the price of printing an etching from stone was much lower than from a copper plate: a wide format map printed from a lithogra-

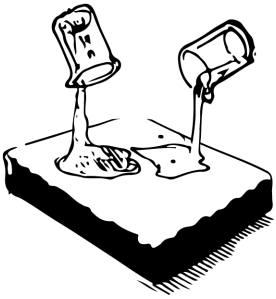
1 The elevated manner opposing the engraved manner is how Senefelder distinguished between the different ways one could print from stone. These terms are how these are translated in the English edition of Senefelder's A complete course of lithography published in London in 1819. (p. 203-320).

2 The manner of Etching on Stone is found translated in the same 1819 edition between page 290 and 304.

ph in such a manner would've cost only 50 cents in France, and before with etching would've cost an average of 7 francs. (1882, p. 358). But the disadvantages of such a method should also be mentioned: printmakers were aware that the stone matrix was much more likely to break, and the etching of the drawing itself was slightly slower than doing it conventionally on metal. The heavy weight of stone made the work more painstaking, as it was harder to transport the stone from the drawing station to the press.

To produce a lithograph in the etching manner, the stone is cleaned and prepared with gum arabic and nitric acid. (Senefelder, 1819, p. 203). According to Godefroi Engelmann (1839), one prepares the stone with a shallow layer of gum, which will prevent the grease from fully attaching to the surface of the stone. (p. 293).

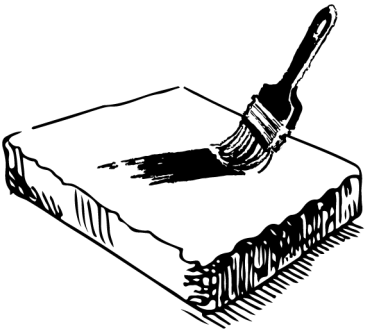


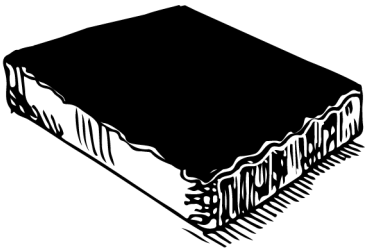


The stone is fully covered with etching ground, normally used by printmakers on metal.[3] If the ground is in its solid form, it is advised to warm the stone and let the ball sit and melt on its surface. In the 19th century, both Engelman and Senefelder talked about having an available baker's oven to do so. The heat would have to be controlled carefully, as too much heat could break the stone itself. To prevent it, a ball of etching

3 We've tried any liquid Charbonnel Ground for etching. Either the L'amour or Ultraflex will work perfectly.

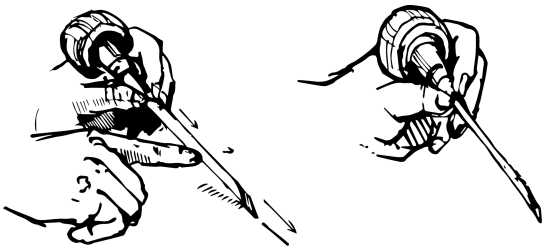
ground could've instead been dissolved in turpentine oil and brushed in the liquid form on the surface of the stone.



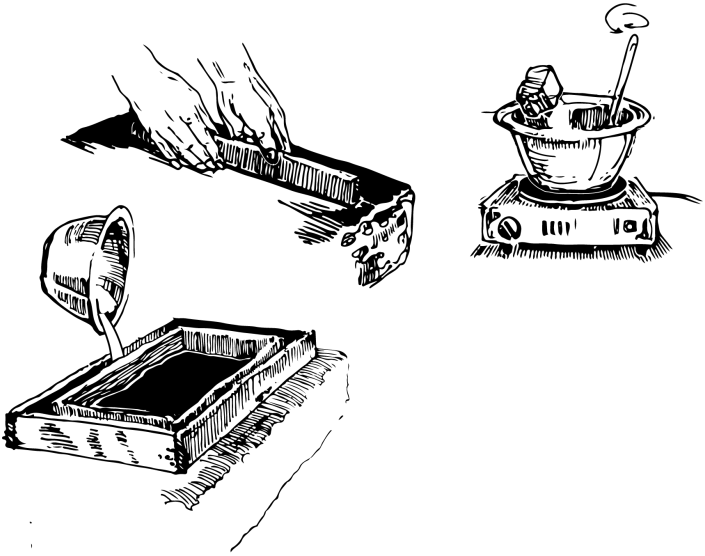


The stone could be smoked as well to produce a contrast when drawing on its surface. Commonly used in intaglio printmaking at the time, a white ground could've been applied on top of the ground coating the stone, in order to emulate the surface of paper. Unlike copper however, the lithograph stone is white, so it's not possible to create enough contrast between the white ground and the stone. Therefore Senefelder suggests practitioners to color the surface of the stone with blue, brown or black. (1819, p. 292-293).

Producing the linework on top of the ground can be made directly on the coat, or, alternatively, drawn first on paper, and then traced by rubbing its surface with sanguine against the stone. Other transfer methods available could also have been employed. Drawing is performed by needle or burin, and Senefelder notes that one should only pierce through the coat enough to see the surface of the stone (1819, p. 293). Very sharp tools will scratch, which isn't the intention of this method. Needles that were more blunt were advised as these would help to draw more fluidly in the direction the user desired. (Engelman, 1839, p. 294).

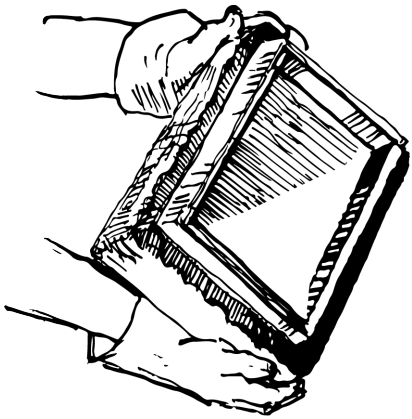


As Engelman explains, in order to etch the stone one can assemble a wax border around its edges (1839, p. 294). To make a perfectly regular border we devised a mold system[4] by making two concentric frames of clay, leaving some space in between them. The beeswax has to be melted and poured into this space between the concentric frames of clay. The clay won't allow the melted wax to escape the mold onto the other areas of the stone.



4 Technical solution devised with the help of Alcides Rodrigues, technician for Modeling and Molding Technical and Officinal Service of FBAUP.

Having created the wax border, one should add 1 part of nitric acid per 40 times the volume of water, which is then poured and left out to etch the drawing on the etching ground coat, like one would do when etching a copper plate. A small and soft brush can be useful to break the small bubbles created by the nitric acid, but take note to closely inspect the drawing, as the lighter lines will start to widen more than the drawing initially made throughout the etching process. To effectively control the thickness of the drawn lines, several etching baths should be undertaken, much like one would do when etching metal. The used solution of nitric acid is poured down into a container by lifting the stone up in the air and turning it on one side with your hands, which should be protected with the right equipment.

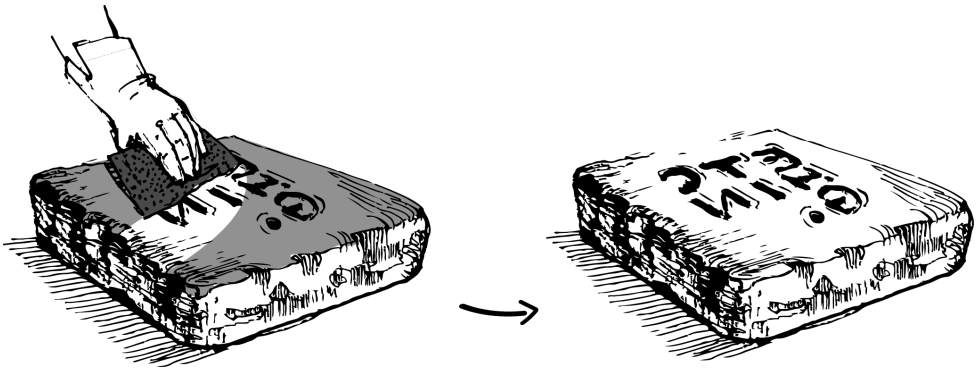


One should determine the depth of the etching on the stone with a magnifying glass and piece it with a small needle. Take notice of the most shallow cavities as well as the wider lines, as these will be the most difficult to print.

The next steps are crucial and must be done with care and adaptability, starting with drying the stone properly to ensure the ink will attach itself to the hollow cavities of the etched drawing. Senefelder's chemical ink should be warmed up in the heating source, and the stone itself should also be slightly heated. A hairbrush will easily suffice for the next step: hold it against the etched surface for a while, and use the palm of your hand to assure the surface is warm but not enough to burn your skin. Do not overheat the surface, otherwise small portions of the etching ground might melt into the cavities. Because the chemical ink is now more malleable due to the heat, it will now easily fill even the shallowest lines. A sponge or a disposable piece of soft fabric can be used to push the ink in. Make sure not to deposit excess ink on the stone, taking care to spread a fine film gently over its surface.

Once the ink has completely filled the etched lines, let it sit for a while. A lunch break of 1 hour would be advisable, although we aren't able to accurately pinpoint the specific amount of time. The stone could be left to rest for a day if possible. Pour a small portion of turpentine oil on a piece of soft fabric and gently remove the etching ground in a circular motion.

In theory, as per Engelmann's writings (1839), the etching ground should easily come out because there is a small layer of gum protecting the surface of the stone. However, the process is not that simple: one shouldn't apply a lot of pressure as the ink might be accidentally removed from the cavities during this process. It's important to do this part patiently, assuring only the etching ground is being removed whilst rubbing the surface with turpentine oil. If small portions of ink do come out of the cavities do not concern yourself too much with it, as you are expected to regularly ink it during the rest of the process. Once you have removed a fair amount of the etching ground, your drawing should be filled with ink but partially stained around. Here, a pumice stone can come in hand by using it ro rub the stone gently until its surface is white and clean. If you do not have a pumice stone, a very fine grain sandpaper will suffice.

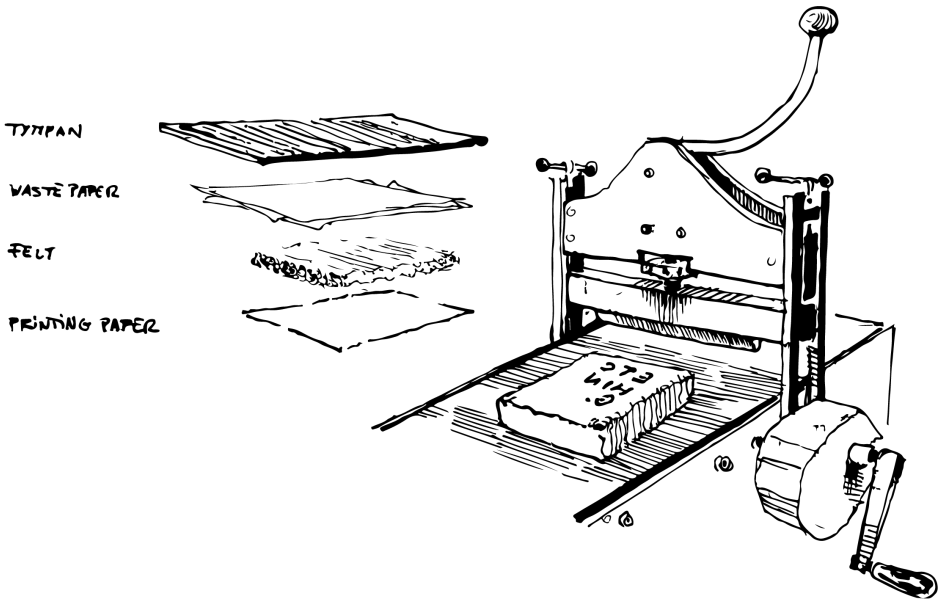


Now, the etched area of the stone is filled with greasy ink and its surface bare and receptive to water. If the drawing is not fully filled up with ink, spread a very fine film of gum arabic on the surface of the stone, and dry it. Another piece of fabric is rubbed with liquid asphalt on the areas of the drawing that are missing ink. Let it sit for a couple of minutes and then use a wet sponge to remove the excess asphalt on the upper surfa-

ce. Do this as many times as possible, little by little until you're satisfied with its appearance.

Roll up the lithography printing ink and slowly ink the stone with a leather roll, after moistening it with a clean sponge. Take notes of the directions and the amount of times you are rolling up the stone during printing.

You'll be working with a regular lithograph press. Although it's not mentioned in the original writings, we advise you add a felt in between the stacked paper and the tympan The press' bed should include a felt — such as the one used for intaglio printing — to effectively collect all the information on the etched stone onto the paper during the printing process.



According to the Bibliothèque Pratique De l'imprimeur (1887), one can prepare a mixture of tallow, lampblack and turpentine to conserve the stone for later printing. The essence will evaporate and leave the black coloured grease protecting the drawing. (p. 65).

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