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STONE ENGRAVING.

The art of engraving on precious stones or gems, called *pietré duré*, says the "Encyclopædia Londoniensis," is one of those wherein the ancients excelled; there being many antique agates, carnelians, and onyxes which greatly surpass anything of the kind produced by the moderns. Pygoteles, among the Greeks, and Dioscorides, under the first emperors of Rome, are the most eminent of these engravers recorded in history. The former was so esteemed by Alexander that he forbade anybody else to engrave his bead, and Augustus' head, engraved by the latter, was deemed so beautiful that the succeeding emperors chose it for their seal. The polite arts having been buried under the ruins of the Roman empire, the art of engraving on gems met with the same fate. It was revived in Italy in the beginning of the fifteenth century, when John, of Florence, and after him Dominic, of Milan, performed works of this kind no way to be despised. From their time such sculptures and seals became common in Europe and particularly in Germany, whence great numbers were sent into other countries, but they were far short of the beauty of those of the ancients. The number of engravers of gems has been so great that the collection made by Mr. Taffie, in Leicester Square, London, alone occupies two large quarto volumes in the mere recital.

Our engraving shows a portion of the interior of the stone engraving establishment of Messrs. Shaffer & Hahn, of 66 Nassau street, New York city. The great bulk of stone engraving done in the country is executed here. Anything from an initial letter or crest to the finest relief portrait can be done in this establishment.

The engraving is not confined to any particular kind of stone, but onyx, by reason of its peculiar adaptability to the purpose, is preferred.

The raw onyx is treated before engraving, to give it color. This treatment, in the case of the black stone, consists in boiling it in molasses for a time, varying from four days with the softer varieties to as many weeks with the harder varieties. The stone is at first of a greenish-gray. After boiling in molasses it is treated with sulphuric acid, which carbonizes

the molasses absorbed by the stone. The stone is colored a dark brownish-red by means of oxide of iron. Stones striated with light-colored layers are colored only in the softer and darker parts, the harder parts being incapable of absorbing the coloring matter.

The engraving is done by means of diamond powder applied to the edges of soft iron wheels of different thicknesses and diameter. These wheels are revolved in a suitable lathe driven by foot power.

The stones are cemented to a cork for convenience in handling, and the operator holds them in contact with the wheel, at the same time viewing his work through a magnifying glass. This work requires a true artist, who must be a mechanic as well.

The diamond used on the wheels is crushed and powdered in the steel mortar shown in one of the smaller views (Fig. 5).

The engraving shows, in addition to the interior of the establishment, the operation of boiling a specimen of the crude stone, and examples of the work.

Washington Monument.

The engineer in charge of the construction of Washington Monument, in Washington, reports that the addition to the height of the structure since the work was renewed, August 7, 1880, is 100 feet. The monument is now 250 feet high above the base. Seventy-four feet were added last year. The balance of appropriation available December 1 was enough to carry the obelisk to the height of 286 feet.

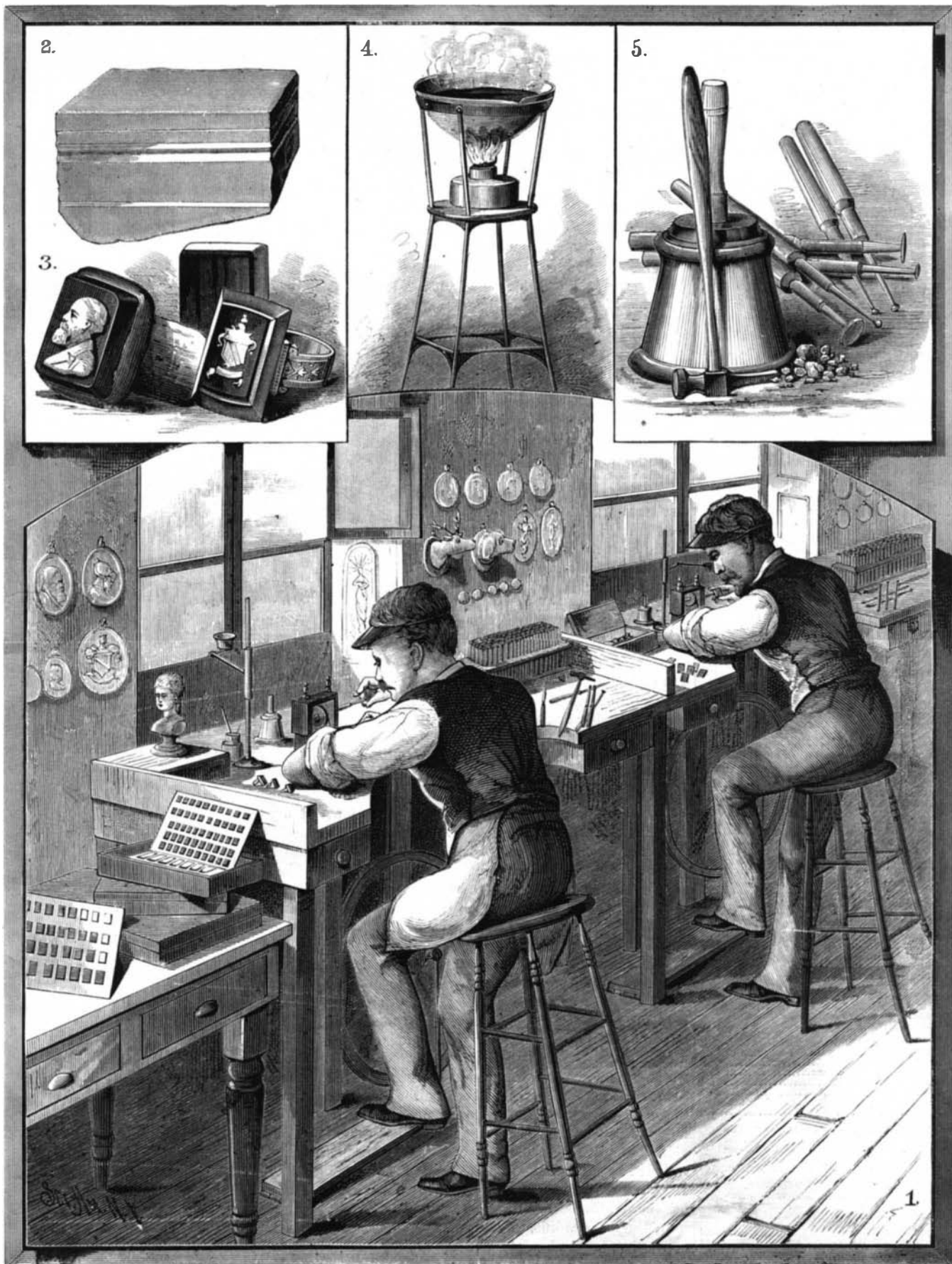
White Slates.

A German, named Schmidt, has patented a school slate which consists essentially of a stiff piece of white cardboard, covered with artificial or paper parchment prepared by the

action of sulphuric acid upon unsized paper.

They are set in the ordinary wooden frame, and furnish a cheap and indestructible slate. The ordinary size sells for 30 pfennigs (7½ cents). He also makes a peculiar kind of ink for use with these slates, called "children's ink" (*Kindertinte*). It is made of harmless mineral colors and a solution of dextrine, and has an advantage over common ink, that the blots which children are sure to make can be easily washed out with cold water. The same slate can also be used to write on with ordinary ink or lead pencil, and both washed off with a moistened sponge.

When the slates are intended for use with lead pencils they are coated with water glass, which permits of writing upon the slate immediately after washing and while still wet. If in the course of time the water glass film gets dirty it can be removed with a piece of sandpaper and a new coating applied with a sponge. The tablet itself shows through the parchment and water glass film perfectly mat' white, which permits of its being used in any light, and is especially advantageous for drawing because the shading of drawing is black, and that is more natural than to make white shading with white chalk. Colored pencils or crayons can also be used, and is useful in teaching natural history.



ENGRAVING PRECIOUS STONES.