

### "BLUE PROCESS" OF COPYING DRAWINGS.

From X B., *Mattewan, N. Y.*—Can you give me any information about transferring by the "blue process?" That is, by the employment of citrate of iron and red prussiate of potash. I cannot get the blue ground dark enough.

*Answer.*—The "blue process" for copying may not be familiar to many of our readers, but as it may be useful to some of them, and a matter of interest to many more who may have wondered at the strange drawings in white lines on a blue ground which they have sometimes seen in shops, we will describe the process at length. The operation is really a kind of photographing. The materials used turn blue if they are washed in clear water after they have been exposed to the action of the light. From our correspondent's description of his trouble it would seem that the exposure was not sufficiently long, or the light was not bright enough.

The following directions in a paper by Mr. P. Barnes, read before the Institute of Mining Engineers, at Philadelphia, in 1876, may be found of use, especially those portions relative to the time necessary for exposure to the light.

It may be of interest, and perhaps of importance, to the members of the Institute that specific mention should be made in detail of the great value of this method of copying or photographing all kinds of tracings.

Several samples are laid upon the table, which may serve as illustrations of the results obtained. Some of these show slight imperfections, depending upon the character of the tracing and upon the length of the exposure to the light, but it may be clearly seen that even a faint copy would be quite available for actual use.

The process is believed to be of French origin, and has been used for many years. Special attention seems to have been directed to it recently, and its great value to engineers appears likely to be fully recognized. The manipulations required are of the simplest possible kind, and are entirely within the skill and comprehension of any office boy who can be trusted to copy a letter in an ordinary press. These particulars may be summarized somewhat thus:

1. Provide a flat board as large as the tracing which is to be copied.
2. Lay on this board two or three thicknesses of common blanket or its equivalent, to give a slightly yielding backing for the paper.
3. Lay on the blanket the prepared paper, with the sensitive side uppermost.
4. Lay on this paper the tracing, smoothing it out as perfectly as possible, so as to insure a perfect contact with the paper.
5. Lay on the tracing a plate of clear glass, which should be heavy enough to press the tracings close down upon the paper. Ordinary plate glass of three-eighth-inch thickness is quite sufficient.
6. Expose the whole to a clear sunlight by pushing it out on a shelf from an ordinary window, or in any other convenient way, for 6 to 10 minutes. If a clear skylight can only be had, the exposure must be continued for 30 to 45 minutes, and under a cloudy sky 60 to 90 may be needed.
7. Remove the prepared paper and wash it freely for one or two minutes in clean water, and hang it up by one corner to dry.

Any good hard paper may be employed (from even a leaf from a press copy book up to Bristol board) which will bear the necessary wetting.

For the sensitizing solution take  $1\frac{1}{2}$  ounces of citrate of iron and ammonia and 8 ounces of clean water; and also  $1\frac{1}{2}$  ounces of red prussiate of potash and 8 ounces of clean water; dissolve these separately and mix them, keeping the solution in a yellow glass bottle, or carefully protected from the light. The paper may be very conveniently coated with a sponge 4 inches in diameter, with one flat side.

The paper may be gone over once with the sponge quite moist with the solution and a second time with the sponge squeezed very dry. The sheet should then be laid away to dry in a dark place, as in a drawer, and must be shielded from the light until it is to be used. When dry, the paper is of a full yellow and bronze color. After the exposure to the light the surface becomes a darker bronze and the lines of the tracings appear as still darker on the surface. Upon washing the paper the characteristic blue tint appears with the lines of the tracing in vivid contrast.

It will readily be seen that the process is strictly photographic in the ordinary sense of the word, the tracing taking the place in the printing of the ordinary glass negative. A working drawing thus made furnishes its own background, and does not re-

quire to be placed over a white background, as is often the case with a tracing. If desired, the copy can be made upon common bond paper, which can be mounted upon a board in the usual way. Inasmuch as such copies can be made from tracings only, it may be well to suggest and urge that drawings can be completed, or nearly so, in pencil upon paper in the usual way, and that all the inking can be done upon tracing cloth laid upon the pencil work. In this way the cost of the tracing (in the ordinary sense) can be wholly saved, and the single copy of the finished tracing can thus be made in the "blue way" to the best possible advantage.

It may safely be said that this method of copying can be employed, if only one or two copies per week are needed of ordinarily complex drawings, with excellent results, and with a very important saving of time and money.

### WEIGHING AN ELEPHANT WITHOUT SCALES.

An Indian writer relates an interesting anecdote concerning Shajee, the father of the first ruling prince of the Mahrattas of Hindostan, who lived at about the beginning of the seventeenth century. On one occasion a certain high official made a vow that he would distribute to the poor the weight of his own elephant in silver money; but the great difficulty that at first presented itself was the mode of ascertaining what this weight really was; and all the learned and clever men of the court seem to have endeavored in vain to construct a machine of sufficient power to weigh the elephant. At length, continues *Little Folks*, it is said that Shajee came forward, and suggested a plan, which was simple, and yet ingenious in the highest degree. He caused the unwieldy animal to be conducted along a stage, specially made for the purpose by the water-side, into a flat-bottomed boat; and then, having marked on the boat the height to which the water reached after the elephant had weighed it down, the latter was taken out, and stones substituted in sufficient quantity to load the boat to the same line. The stones were then taken to the scales, and thus, to the amazement of the court, was ascertained the true weight of the elephant.

**THE USES OF LEMONS.**—Lemons are easily raised in the South, and if they possess half the virtues ascribed to them, no one should fail to plant a few trees wherever they will grow. An exchange says: "Lemon juice is the best antiscorbutic remedy known. It not only cures the disease but it prevents it. Sailors make a daily use of it for this purpose. A physician suggests rubbing of the gums daily with lemon juice to keep them in health. The hands and nails are also kept clean, white, soft and supple by the daily use of lemon instead of soap. It also prevents chilblains. Lemon is used in intermittent fevers mixed with strong, hot black tea or coffee, without sugar. Neuralgia may be cured by rubbing the part affected with a lemon. It is valuable also to cure warts, and to destroy dandruff on the head, by rubbing the roots with it. In fact, its uses are manifold, and the more we employ it externally the better we shall find ourselves. Natural remedies are the best, and nature is our best doctor, if we would only listen to it. Decidedly rub your hands, head and gums with it, and drink lemonade in preference to all other liquors." Lemon juice is also said to be an antidote for snake poison by pressing the juice into the bite and by eating the lemons. Many testify to the beneficial effects of lemons in pulmonary diseases, and consumptives have been cured by eating them freely every day. They will give immediate relief to the most troublesome corns and cure them if their use is persevered in. Hot lemonade is the pleasantest remedy known for colds, and lemon pie for hunger.

**WOODWORK BURNED BY STEAM.**—The *American Manufacturer* says: "At the Crescent Steel Works, in this city, a steam pipe  $2\frac{1}{2}$  inches in diameter, carrying from 90 to 100 pounds pressure, was laid under ground about three years ago, encased in common pine boards about one inch thick. A few days since occasion was had to dig up the pipe, and the whole length of the wooden drain was found to be charred and apparently burnt about three-fourths of the thickness of the wood, the other portion being partially rotted. The whole inside of the drain was turned to charcoal, with here and there spots of white ashes, showing that ignition had actually taken place. It seems probable that if the casing had not been excluded from the air by the earth covering it, it would have blazed and been entirely consumed. It is generally believed that a steam pipe cannot set fire to wood, but this case seems to prove the contrary, and it may explain the origin of so many mysterious fires."