

THE BLUE PROCESS OF COPYING TRACINGS, ETC.

This process is now extensively used in the drawing-rooms of a number of firms and companies, and saves not only much labor, but a great deal of weariness to the junior draftsmen to whose lot it usually falls to make copies or tracings of drawings. The *Railroad Gazette* says that in the office of Messrs. William Sellers & Co., and in the drawing-room of the Pennsylvania railroad at Altoona, all tracings, when more than one copy is required, are made by this method. It is described as follows in a short paper read by Mr. P. Barnes before the Institute of Mining Engineers:

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 ensure a perfect contact with the paper.
5. Lay on the tracing a plate of clear glass, which should be heavy enough to press the tracing close down upon the paper. Ordinary plate glass of $\frac{3}{8}$ " 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 six to ten minutes. If a clear skylight only can be had, the exposure must be continued for thirty or forty-five minutes, and under a cloudy sky, sixty to ninety minutes may be needed.
7. Remove the prepared paper and drench 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 $1\frac{1}{2}$ oz. citrate of iron and ammonia and 8 oz. clean water; and also, $1\frac{1}{2}$ oz. red prussiate of potash, and 8 oz. 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 of four inches 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 or bronze color; after the exposure to the light the surface becomes a darker bronze, and the lines of the tracing 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. Hence all details are closely reproduced, even to the texture or threads of the tracing-cloth.

A working drawer thus made furnishes its own background, and does not require to be placed over a white ground, 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 the 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 ordinary complex drawings, with excellent results and with a very important saving of time and money.

A ready means of adding to or correcting the blue copies may be found in the use of a solution of carbonate of soda or potash, used with a pen or brush.

OUT-DOOR SAFETY.

The fear of the weather has sent multitudes to the grave, who otherwise might have lived in health many years longer. The fierce north wind and the furious snow-storm kill comparatively few, while hot winter rooms and crisp summer suns have countless hetacombs of human victims to attest their power. Except in localities where malignant miasms prevail, and that only in warm weather, out-door life is the healthiest and happiest, from the tropics to the poles.

The general fact speaks for itself, that persons who are out of doors most take cold least. In some parts of our country, near one-half of the adult deaths are from diseases of the air passages. These ailments arise from taking cold in some way or another; and surely the reader will take some interest in a subject, which, by at least one chance out of four, his own life may be lost.

All colds arise from one of two causes.

1. By getting cool too quick after exercise, either as to the whole body, or any part of it.
2. By being chilled, and remaining so for a long time, from want of exercise.

To avoid colds from the former, we have only to go to a fire the moment the exercises cease in the winter. If in summer, repair at once to a closed room, and there remain with the same clothing on, until cooled off.

To avoid colds from the latter cause, and these engender the most speedily fatal diseases, such as pleurisies, croup, and inflammation of the lungs, called pneumonias, we have only to compel ourselves to walk with sufficient vigor to keep off a feeling of chilliness. Attention to a precept contained in less than a dozen words, would add 20 years to the average of civilized life: keep away chilliness by exercise; and when overheated cool off slowly. Then you will never take cold in-door or out!—*Hall's Journal of Health.*

ANALYSES OF HAIR DYES.—The London *Lancet* had recently twenty-one "hair-restorers," "hair dyes," analyzed. Out of the twenty-one samples examined, no less than fourteen were practically identical in their nature. They contained sulphur in suspension, and also lead in varying, but always in very considerable quantity. Three of these preparations have American labels, the rest were English. The descriptions varied a good deal. Only one was plainly described on the label as poisonous, if taken internally, while many were described as "perfectly harmless," "free from injurious substances," and so on. The prices varied from 25 cents to \$1.50 per bottle.

Two more samples, one of them American, were found to contain lead and sulphur, but in a different form. The sulphur was present as hyposulphite, and, in fact, these preparations may be substantially imitated by adding hyposulphite of soda to a solution of a lead salt. A white precipitate first appears, which dissolves in excess, and the solution so obtained does not give a precipitate with iodide of potassium. This is noteworthy, because in the handbill which accompanies one of the samples, purchasers are warned against the dangerous hair preparations which contain lead, as likely to lead to paralysis of the brain and insanity, and are directed to test all preparations with iodide of potassium.

In another sample, an American one, no free or loosely-combined sulphur was found, but only lead, in considerable quantity.

Another of the preparations was contained in two bottles; in one of which ammonio-nitrate of silver, and in the other pyrogallie acid was detected. This, therefore, belongs to an entirely different class from the preceding.

The remaining three preparations analyzed were intended for lightening, instead of darkening the color of the hair. No substantial difference between these samples was detected. Each was found to contain a tolerably concentrated and slightly acidulated solution of peroxide of hydrogen. It is well known that this is the active agent in preparations of this kind. It can hardly be considered as poisonous, but its action on the hair is said to be injurious.

VARNISH FOR SILVERWARE.—Gum elemi, 30 parts; white amber, 45; charcoal, 30; spirits of turpentine, 375. It must be used in a heated state, the metal to which it is to be applied being also heated.