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ON THE USE OF COLLODION IN PHOTOGRAPHY.*

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THE imperfections in paper photography, arising from the uneven texture of the material, however much care may be taken in the manufacture of it, and which from its nature, being a fibrous substance, cannot, I believe, be overcome, has induced me to lay it aside and endeavor to find some other substance more applicable, and meeting the necessary conditions required of it, such as fineness of surface, transparency, and ease of manipulation.

A layer of albumen on glass answers many of these conditions, producing a fine transparent film, but it is difficult to obtain an even coating on the glass plate; it requires careful drying, and is so extremely delicate when damp that it will not bear the slightest handling; besides these objections, the necessity of having a large stock of glass when a number of pictures are to be taken, is much against its general use. My endea-

vor, therefore, has been to overcome these difficulties, and I find from numerous trials that *Collodion*, when well prepared, is admirably adapted for photographic purposes as a substitute for paper. It presents a perfectly transparent and even surface when poured on glass, and being in some measure tough and elastic, will, when damp, bear handling in several stages of the process.

I will now give a short outline of my mode of using it. The first step in the process is to prepare the solution of collodion. There are several ways of doing this, but I will briefly allude to two.

Pour a quantity (say 1 oz.) of collodion into a bottle containing dry iodide of silver. Shake them well together, and then allow the excess of iodide of silver to settle. The collodion will in this way take up a certain quantity of the silver salt, and become opaque; it should then be transferred to another bottle containing iodide of potassium, to be again well shaken up until the iodide of silver is entirely dissolved, and the solution becomes perfectly transparent.

Or this:—To a solution of iodide of

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potassium in spirits of wine add a small quantity of iodide of silver sufficient to saturate the iodide of potassium; let, however, the latter salt be in excess. Add a small quantity of this solution to the collodion, between 5 and 10 grs. by measure to 1 oz. of collodion will be sufficient, and if any of the iodide of silver should precipitate, a small quantity of iodide of potassium must be added to dissolve it. In this way, or by the former mode, the collodion may be prepared.

The next step is to spread this solution evenly on a plate of glass. This can be done by pouring a sufficient quantity on the glass to run in a body freely. When it has entirely covered the glass plate, let the superabundance be drained off at one corner into the bottle again; this operation cannot be done too quickly, for the ether rapidly evaporating would prevent the collodion running evenly over the surface of the plate, from becoming too thick.

The plate is now plunged into a bath of nitrate of silver, allowed to remain there for a few seconds, and then washed in water. (This washing is intended to remove all the ether from the surface of the collodion, which, if allowed to remain, would cause an unevenness in the sensitiveness of the surface, producing streaks or spots.) Immediately after washing, it may be exposed to the action of light for the time necessary to obtain a picture. This picture can be developed either by gallic or pyrogallic acid. If the latter acid be used, a few precautions are necessary, to which I will allude presently. The former acid may be used as a bath, in the ordinary way. After the picture is developed, the film of collodion should be loosened from the edges of the glass plate with a flat glass rod. By doing this, it will easily separate from the plate and can be allowed to float freely in the water bath, previous to being placed in the bath of hyposulphite of soda, and then again thoroughly washed.

The drawing can now be mounted on a plate of glass, and when dry can be varnished, to protect it from injury.

If thought more convenient (and, in fact, this mode is the best when pyrogallic acid is used), the film of collodion, after being exposed to light and the image developed, can be removed from the glass plate (leaving the fixing and final washing to be done at leisure) by rolling it up on a glass rod, thus:—Take a sheet of ordinary white wrapping or thick blotting paper (if glazed it will be better), about the same breadth and about one-third longer than the drawing to be removed, soak it in water, and place

it with the glazed side in contact with the surface of collodion. Turn the end of the collodion picture over the edge of the paper lying upon it, then place the glass rod just within the edge, and commence rolling it upon the rod; with a little dexterity, this can be accomplished without injuring the drawing. The cylinder thus formed, is easily removed from the glass rod, and can be preserved for any length of time in this state by being kept damp and away from the light, to be finally fixed at some more convenient time. Thus one plate of glass will be sufficient to make any number of drawings upon, the above operations being repeated for each picture.

The plate of glass should be rather larger than the drawings intended to be made upon it, to allow for rough edges, &c. The back of the glass may be ground to get the focus upon, and one side should be formed into a kind of handle to prevent the hand of the operator being near the solution when the glass is in use.

30 grs. of nitrate of silver to 1 oz. of water will be sufficient for the nitrate of silver bath.

3 grs. of pyrogallic acid to 1 oz. of water, to which must be added about 1 drachm of acetic acid.

Between 5 and 10 grs. of nitrate of silver to 1 oz. of water.

The two latter solutions are to be mixed in equal proportions when a picture is to be developed. A wide-mouthed glass measure will be necessary to hold this mixture.

I have found it convenient to have a trough made of gutta percha, the two sides and bottom of which are about $\frac{1}{2}$ inch high and just large enough to hold the glass plate. With this trough the mixed solution can be poured rapidly over the plate, without fear of any being thrown over the edges.

18th February, 1851.