

## PRINTING WITHOUT THE SALTS OF SILVER

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### *Process with the Salts of Iron*

Sir John Hershel discovered, several years ago, that certain of the persalts of iron, when exposed to light in connection with organic matter, undergo decomposition, and are reduced to the state of proto-salts; and we are indebted to Poitevin for numerous interesting developments in this department.

For instance the perchloride so exposed, becomes reduced to the proto-chloride or, as Monckhoven more appropriately remarks, to the state of oxi-chloride. For this purpose the sesquichloride must be quite neutral. The ammonio-tartrate, potassa-tartrate, and the ammonio-citrate of iron are much more sensitive to light than the sesquichloride, and the latter salt the most of all.

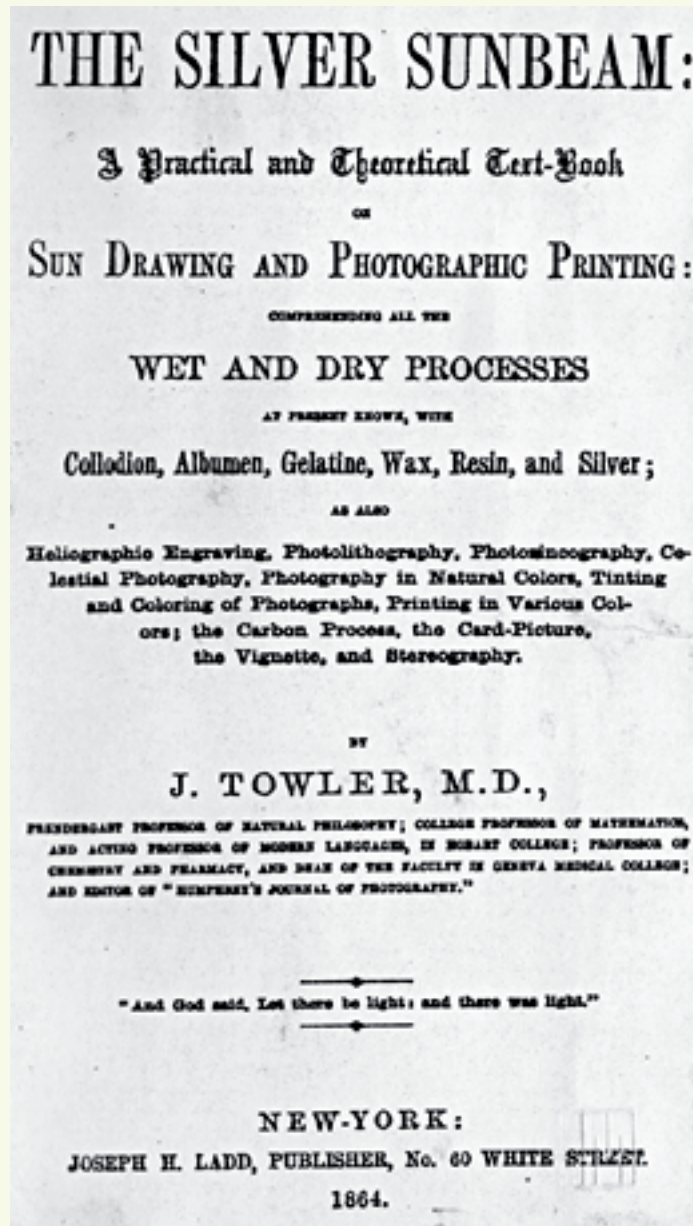
The image formed by means of these salts is much fainter than that with the chloride of silver; but it can be intensified by the application of other metallic salts. The mode of operation consists in floating the paper on the solutions in question, in the dark-room, in allowing them to dry and then exposing them afterward beneath a negative, as usual, with paper prepared with chloride of silver.

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### *Process with the salts of Uranium.*

The discovery of this process owes its origin to Niepce de St. Victor and to Burnett. The nitrate of the sesquioxide of uranium undergoes in connection with organic matter, when exposed to the sun, a decomposition analogous to that of the sesquichloride of iron. The paper, without having undergone any preceding preparation, excepting that of having been excluded from the light of several days, is floated on a bath of the nitrate of uranium, as follows:

Distilled water	.	.	.	10 drachms
Nitrate of uranium .	.	.	.	2 drachms



The paper is left on the bath for four or five minutes; it is then removed, hung up and dried in the dark-room. So prepared, it can be kept for a considerable time.

The exposure beneath a negative varie from one minute to several minutes in the rays of the sun, and from a quarter of an hour to an hour in diffused light. The image, which is thus produced, is not very distinct, but comes out in strong contrast when developed by one of the following developers:

*Nitrate of silver developers*

Distilled or rain water,	.	.	.	2 drachms
Nitrate of silver,	.	.	.	7 grains
Acetic acid,	a mere trace			

The development is very rapid in this solution; in about half a minute it is complete. As soon as the picture appears in perfect contrast, the print is taken out and fixed by immersion in water, in which it is thoroughly washed.

*Chloride of gold developer.*

Distilled water,	.	.	.	2 drachms
Chloride of gold	.	.	.	2 ½ grains
Hydrochloric acid	.	.	.	½ a drop

This is a more rapid developer than the preceding. This print is fixed in like manner by water, in which it must be well washed, and afterward dried. When dried by artificial heat the vigor of the print is increased. Print that have been developed by the solution of nitrate of silver may be immersed in the gold bath, which improves their tones.

The picture may be developed, also, by first immersing the prints in a saturated solution of bichloride of mercury, and afterward in one of nitrate of silver. In this case, however, the time of exposure is increased. Pictures may be obtained also by floating the papers on a mixture of equal quantities of nitrate of silver and nitrate of uranium, in about six times their weight of water. When dry they are exposed beneath a negative. In this case the image appears as in the positive printing process with chloride of silver, being effected by the decomposition of the nitrate of uranium, which, reacting on the nitrate of silver, decomposes this salt, and reduces the silver. These prints require fixing in the ordinary fixing bath of hyposulphite of soda, and then washing as usual.

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Questioni di stile