Photographic Notes

Development.

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Development, in a photographic sense, means the art of bringing out and fixing the latent image in a plate which has received an exposure in the camera.

If a plate be examined after it has been exposed, it will be found impossible to detect that any change has taken place. There are several theories put forth as the actual change which does take when a plate is exposed, a very popular one being that of an electrical action being set up, and to that theory I myself lean.

There are several developing agents in use at the present day, the best known of which are pyrogallic acid, hydroquinone, and iron. Though the hydroquinone is comparatively new in the field, it has already found many admirers.

In both pyrogallic acid and hydroquinone developers (neither of which reducing agents alone would develop a plate satisfactorily), there is added an accelerator, such as carbonate of soda, potash, sodium hydrate (caustic soda), or ammonia.

It is also necessary to have a restrainer, such as bromide of ammonium, or bromide of potassium, without which we should find great difficulty in bringing a negative up to the printing density.

There is also another ingredient which is not absolutely necessary, namely, sulphite of soda. It acts slightly as a restrainer, but it is added to a developer to prevent the plate being stained. Many workers, and amoung them a considerable number of professionals, use little or no sulphite, preferring the printing quality of a yellow negative.

If the development be prolonged with a developer without sulphite, the stain is so bad at times as to make the printing very slow, but it can be readily removed in any ordinary clearing bath.

The following is a simple and efficient one :

Saturated solution of (common) alum	2 ozs.
Hydrochloric acid	1 oz.

Which bath may be used repeatedly until much discolored.

For the production of beautiful-looking negatives, lantern-slides, transparencies, opals, bromide paper prints, and enlargements, the iron or ferrous-oxalate developer is generally used, because of its non-staining quality. Its drawback for negative work is the little chance i tgives of modifying it to correct over and under exposure. The following are the proportions :

Neutral oxlate of potash	10 ozs.
Water (warm)	30 "
Label "P" (potash),	
Proto-sulphate of iron (ferrous sulphate	3 ozs.
Citric acid	60 grs.
Water	10 ozs.
Label "I" (iron).	

The above solutions are used in the proportion, three parts of P to one part of I. Thus to develop a half-plate pour into the measure 1½ oz. of I, being careful to remember to pour the iron into the potash, not *vice versa*, otherwise the developer will be at once spoiled.

With a plate which has been correctly exposed, you may be sure of getting a clean, sparkling image with the iron developer, which may be used again and again until its strength is exhausted.

In case of under exposure, a thing not uncommon in England, where the light is very poor and instantaneous exposures are made, have at hand a solution of 20 grains of hyposulphite soda to 1 oz. of water, and to each ounce of the developer add from 10 to 20 drops. You have then one of the most powerful detail giving developers known, and you may rest assured that the full result of the exposure will be brought out. The negative can then be brought up to proper density by intensifying it with mercury and ammonia. If, on the other hand, you find the plate over-exposed and developing too quickly, have by you a solution of restrainer, 20 grs. of bromide of potassium to 1 oz. of water, and into each ounce of the developer put about ¼ drm.

Negatives produced by iron development are crisp, sparkling, full of soft half-tone, and of olive-green tinge, though they do not possess, to my way of thinking, the printing quality of the negative developed with the pyro ammonia developer.

The most generally used, and, in my humble opinion, the best developer for negative work is the pyro-ammonia developer. It is capable of modification to almost any extent. It is also very cheap, recommending itself strongly to the professionals, and all who desire to secure the best results at the lowest cost. Above all, it is a developer which gives a printing quality to a negative unequalled by any other mode of development.

Pyro may be used with almost any alkali, such as carbonate of soda (common washing soda), potash, caustic soda, or ammonia. The following will be found to be a thoroughly good working formula for a pyro-ammonia developer, which has given good results with every brand of plates with which I have used it.

Dissolve 4 ozs. of re-crystallised sulphite of soda in 12 ozs. of warm water, and when cold neutralise with citric acid, which is done by adding small doses of the citric acid until there is no change of color if a line be drawn upon neutral test paper : should the test paper turn blue, more acid must be added, but if red, too much acid has been used (which slows the developing). When cold, add 1 oz. of pyrogallic acid, and label "Pyro."

Bromide of potassium	1 oz.
Water	16 ozs.
LABEL "BROMIDE."	
Ammonia (·880)	1½ oz.
Water	16 ozs.
LABEL "AMMONIA."	

To develop, use the above in the following proportions :—

	Pyro.	Bromide.	Ammonia.
Under-exposure.	¼ drm.	½ drm.	½ drm.
Correct exposure	¼ drm.	½ drm.	½ drm.
Over-exposure	¼ "	½ "	¼ "

(To 2 ozs. of water?)

It is better, in making a developer, to use distilled or boiled water, as in ordinary tap water there is so much impurity, which causes the developer to deteriorate in quality.

The above quantities are sufficient to develop 100 half-plates.

The following simple formula is the one I generally use for instantaneous work :

Water	20 ozs.
Sulphite of soda	½ oz.
Bromide of ammonium	½ "
Ammonia	1½ "

Using 1 drm. to the oz. of water, and dry pyro till sufficient density be obtained usually taking from ½ gr. to 1½ gr.

With plates which will stand sodium hydrate (caustic soda) substitute 1 oz. for the 1½ oz. ammonia. If development be continued for an exceptionally long time, the negative will be slightly stained and, therefore, of greater density, on account of its yellowness, than it appears by transmitted light.

A very clean and good developer is the pyro and potash, and I do not know of a better formula than that by Beach, as follows :—

PYRO SOLUTION.	
Warm distilled water	2 ozs.
Sulphite of soda	2 "
WHEN COLD ADD	
Sulphurous acid	2 "
Pyrogallic	½ "
POTASH SOLUTION.	
Carbonate of potash	3 "
Sulphite of soda	2 "
Water	7 "

Dissolve the salts separately, and then mix. For normal developer take 1 drm. of pyro solution and make up to 2 ozs. with water, adding 20 minims of potash solution. For under-exposure use more of the potash solution, and for over exposure *vice-versa*.

A thoroughly good hydroquinone developer is the following :—

(1.)	
Hydroquinone	160 grs.
Sulphite of soda	2 ozs.
Citric acid	60 grs.
Bromide of potassium	15 "
Water (to make)	20 ozs.
(2.)	
Carbonate of potash	2 "
Ordinary washing soda	2 "
Water (to make)	20 "

Take 1 oz. of each solution, and add 3 ozs. of water for use. When the plate is sufficiently developed, it is washed for a few minutes, and fixed in a bath of

Hyposulphite of soda	5 ozs.
Water	20 "

And when thoroughly fixed (all the whitish opacity removed), wash in running water for about one hour, and place in draining rack (out of the dust) to dry slowly.

The power to correct too much contrast and want of contrast is very great with the pyro developer. Take, for example, a portrait of a lady with a dark, sallow skin and white dress. If developed with a normal developer in the ordinary man-