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THE TANNIN PROCESS.

ONE of the chief features of the new edition of Mr. Hardwich's "Manual," is a new dry process, or modification, the discovery or first application of which is due to Major Russell. The preservative used in this process is a solution of Tannin, which leaves on drying a varnish-like film, not peculiarly hygrometric, or sticky to the touch, but readily softening with water, and affording facilities for quick and easy development. The chief advantages claimed for the process are simplicity of preparation and certainty of result, clean, sharp, vigorous negatives of remarkably good tone being generally obtained.

Mr. Hardwich speaks very highly of the process, and regards it as "most closely allied to wet collodion, both as regards the composition of the sensitive film, and the quality of the picture." Of the operation of the preservative he says:—

"When applied to the surface of the excited film, the tannin keeps open the pores of the collodion, as before described, and the mechanical condition of the film appears to be intermediate between that of Norris's and Fothergill's, being slightly more permeable than the latter, but considerably less so than the former. Independently of this, however, tannin has a very remarkable effect in stimulating the sensitive iodide, and causing it to take a much deeper and more decided impression in the camera.

"It would not be correct to speak of this acceleration as an increased sensitiveness imparted to the iodide, but rather as an augmentation in the force of development, in consequence of which the image starts out quickly, and with more contrast between the extreme tints; the colour of the image is also different, the particles which compose it being no longer grey and crystalline, but finely divided and opaque, so that the negative possesses all those qualities which the photographer requires."

Mr. Sutton, who has experimented largely with the process, says he has "very little doubt that the tannin preservative will turn out the right thing, and that this process will quickly supersede wet collodion for all out-of-door purposes, in which rapidity of action is not required." We have been present at many of Mr. Sutton's experiments at King's College, and have seen many very fine results obtained; but from the drawbacks we have there seen, and those occurring in our own hands, we are scarcely so certain of the universal success of the process.

The details of the manipulations are as follows:—The plate is coated with collodion and excited in the usual bath, on removal from which it is thoroughly washed with common water from a tap or jug, to remove as much as possible of the free nitrate of silver; and a final rinse with distilled water is recommended. A solution of tannin, fifteen grains to an ounce of water, is then poured upon the plate. The tannin may be had of any chemist, and is very soluble in water: the solution should be filtered before use. It is recommended to pour on sufficient of the solution to cover the plate, and, throwing that off, coat again, and place the plate to drain whilst another plate is being prepared. After draining awhile, the plates are to be dried by means of artificial heat.

Mr. Hardwich recommends, as a simple drying box, the placing of a heated flat iron on a levelling stand in common deal box, around the sides of which the plates can be arranged and dried in a few minutes: in our own experiments we used the flame of a spirit lamp for drying the

plates. The exposure is six or eight times as long as that required for wet collodion plates under similar circumstances. On proceeding to develop, the plate is first moistened with common or distilled water—which is very easily effected, as the film is not repellant of water—and then developed with pyrogallic acid and silver. The strength of the developer may vary with circumstances, but about two grains of pyrogallic acid to an ounce of water is a good strength. To this is added a few drops of a twenty-grain solution of nitrate of silver or citro-nitrate of silver, according to the tone desired. If very black tones are desired, with a slightly purple tone by transmitted light, the latter should be used, one grain of citric acid to each grain of nitrate of silver in the solution should be added. If red tones are desired, acetic acid should be added to the developer in the usual way, about fifteen minims to each ounce of developing solution. The development is not so slow as in most of the dry processes, from three to five minutes sufficing when the plate has been properly exposed.

The collodion should be of the kind usually recommended for the dry processes, giving a powdery, porous film, not contractile, and repellant of water, and we think that alcohol at least in equal proportions to ether should be used in preparing the collodion. Some of the best results we have seen produced by this process have been from plates coated with alcoholic collodion prepared by Mr. Sutton. Either a simple iodide, or an iodide and bromide may be used; but we decidedly recommend the latter, inasmuch, as the tendency of the tannin is to give excessive vigour, and without the use of a bromide this tendency is apt to produce hardness. The collodion we have used for the purpose, and which seemed to possess the right qualities, was made by the formula we have given in our ALMANAC, which we will here briefly recapitulate:—Pyroxyline of a powdery character and very soluble, five or six grains in each ounce of solvents, consisting of one part ether, sp. gr. 725, one part alcohol, sp. gr. 805, and one part alcohol, sp. gr. 820. To each ounce of normal collodion two grains of iodide of cadmium, two grains and a half of iodide of potassium, and about half a grain of bromide of cadmium. This collodion had been made nearly twelve months, and was as sensitive in the wet process as when first made.

The results, as we have said, are very fine, the negatives being very brilliant and vigorous, and remarkably clear in the shadows, any foggy deposit on which may be rubbed off when dry without injury to the negative. There are, however, two serious drawbacks, which will, we think, materially tend to prevent the general adoption of this process. The first is one common to all processes, more or less, if great care and cleanliness be not used, but we think belongs to this process in a pre-eminent degree, at least, so far as our own experiments, and opportunities of observing those of others give us an opportunity of judging: we are referring to liability to stains, this increased liability apparently arising from the fact that tannin is in itself, in some degree, a reducing agent. The necessity of careful and cleanly manipulation, however, would not be an objection in the hands of the clever photographer, if results commensurate with the efforts were obtained.

A more fatal objection exists, however, in the tendency which the film has to leave the plate in the processes of developing, fixing, and washing. This is a defect common, in some slight degree, to many of the dry processes, but in this it seems to exist in a pre-eminent degree, and seems to be the result of some action of the tannin. We arrive at