

THE PHOTOGRAPHIC NEWS.

VOL. XI. No. 471.—September 13, 1867.

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THE SULPHOCYANIDE AND GOLD TONING BATH.

Some further experiences with the toning bath of sulphocyanide of ammonia and gold toning bath are interesting, and worth recording as facts, if they do not tend to elucidate satisfactorily the cause of the difficulties which various of our correspondents have stated as the results of their attempts to secure the tones which we have recently obtained, and described in these pages.

Another of our correspondents, whose intelligence and executive skill we cannot doubt, who had failed utterly to secure the variety and excellence of tone which the bath produced in our hands, has sent us some untuned prints on different samples of albuminized paper, and also some pieces of excited paper by the same makers, for experiment. We first proceeded to tone the prints, and subsequently printed on the sensitive paper proofs from various negatives. We have not in a single instance met with failure.

The first noticeable fact in connection with the subject is, that all the untuned prints sent were over-printed in about the degree required for subjecting to the ordinary mode of treatment. With almost all the ordinary alkaline or neutral gold toning baths a certain amount of over-printing is necessary, to allow for the reduction which commonly takes place in fixing and toning. All these prints, when treated with the sulphocyanide toning bath, are, when finished, much too dark; this fact, which we have before mentioned, is especially to be noted, that with this bath there is no appreciable reduction in the processes of toning and fixing, and the prints should leave the pressure-frame as nearly as possible the depth of tint required in the finished picture. This is most important. If there be any degree of over-printing, it will be necessary to carry the toning to the deepest tint of black or blue black to secure tolerable results, and even then the print will often be too dark.

Another fact to be noted, which is well known in relation to other toning processes, but which is especially true here, is that different samples of paper require different modifications in the formula, in order to secure the most complete control over the results to be obtained.

The samples of excited albuminized paper sent, and the prints also, were the *Saxe* paper of a well-known and highly respectable dealer, and the *Rive* of an exceedingly skilful printer and manufacturer of albuminized paper. The prints were toned in an old sulphocyanide bath, which had been used frequently before, and from which the bulk of the gold had been exhausted. A little difficulty was experienced from some slight degree of fingering which the paper had undergone in packing and unpacking, which left greasy spots which rejected the solution from its surface, and thus tended to produce uneven action. From the heat of the weather, and the time which had elapsed since the paper had been excited, the paper was dry and horny, an unfavourable con-

dition for even action. In all cases the paper was a little discoloured from keeping, and the decomposed organic salt of silver, which has produced discolouration in the paper, generally produces in this bath a ready reduction of gold in the whites, giving them a slightly pink tone. The untuned prints, when immersed in the old toning bath, quickly acquired the yellow brown tint which is characteristic of the action of this bath, and, after a short time, began to assume a mottled mealy effect of brown and lavender, which was most unpromising, and which, too, might well suggest, to an eye not experienced in these changes, that the operation was a total failure. The prints were left immersed, however, for half an hour or more, when all this passed away, and an even pleasing tone was secured, which was, in some cases, stopped at a chocolate brown, colder in the half-tones than in the deep shadows, and in other cases was carried to a deep black with rosy half-tones.

We then proceeded to print on the excited paper, taking care not to print too deeply, and so secure a condition which gives greater control in the toning operation. Singularly enough, we found that the *Rive* paper gave softer prints, and was more easily toned than the *Saxe* paper. Both samples, however, by their behaviour, suggested to us that a bath richer in gold would give better results. We accordingly made a fresh bath, increasing the proportion of gold to sulphocyanide. Instead of sixty or forty grains of sulphocyanide to each grain of gold—which we had found to give good results with other samples of paper—we made a bath with twenty grains of sulphocyanide to one grain of chloride of gold dissolved in two ounces of water. This gave us decidedly better results; the toning went on more rapidly, and without the tendency to the uneven, mealy, mottled effect which, in the early stages of its action, the older and weaker bath had shown. In this bath the *Saxe* paper generally commenced with a little irregular action, but the mottled effect soon passed off, and it was possible to get a variety of rich tones of deep brown, warm black and neutral black, and purple or rosy tones without difficulty.

In no case is the tone at all reduced in the fixing bath, and in many cases it becomes richer and deeper. It is possible to get a rich neutral black with half-tones of the same scale of colour; it is possible to get half-tones greyer and colder than the deep shadows; and it is possible to produce a black with rosy half-tones, the difference being chiefly dependent upon the length of time of immersion, although something depends, as in all toning processes, upon the intensity of the negative and the amount of contrast in the print.

We may remark here that some little experiment may be necessary in all cases to master the conditions most conducive to fine results: we have made and used many more baths than we have described. To those satisfied with the results they are obtaining with other processes, and not delighting in experiment for its own sake, we do not counsel working in