

in obtaining typographical impressions from photo-relief surfaces."—Dated 25th February, 1884. *Provisional specification*

My improved phototype blocks are composed of an elastic material or compound, such as glue or gelatine with sugar or glycerine, printers' roller composition, or india-rubber, vulcanised or not, or other similar elastic material or compound, instead of type metal or other solid material or compound, cast from any suitable relief produced by any of the well known photographic methods. Such elastic phototype blocks in the printing press yield under the pressure of the inking roller and tympan according to the varying elevations and depressions of the block, thereby securing gradations and half tones without either dot, line, or stipple.

I declare that what I claim is the power to produce half tones and gradations in the type press by means of an elastic or yielding surface substantially as above described; and the power to print several colours or tints from the same block by means of its elastic or yielding nature substantially as above described.

COLOUR IN DEVELOPED IMAGES.

BY J. B. B. WELLINGTON.

WHAT is the cause of the various colours seen in a developed silver image? This question can be answered in a few words—viz., that it is owing to the state of division the silver has been reduced to. If any one will take the trouble to examine a transparency (say) of a black tone under the microscope, he will see that the particles of metallic silver are somewhat coarse, and easily distinguishable even with a low power. Now examine one of a brown tone; it will be perceived that the deposit is still finer. Finally, take one of a decided red. In this case the particles are so fine as scarcely to be seen. Now to get these results—namely, red tones—it is well known that the exposure must be increased, and the developer restrained; but besides this, something else steps in, and that is, that the length of time it is allowed to stay in the developer has much more to do with the colour than most people imagine. This was pointed out by Mr. Debenham on page 98, which, when I read, was certainly contrary to my preconceived ideas; but before writing this I determined to try his experiment, and can now bear out all he says. Chancing to have some $3\frac{1}{4}$ plates coated with the bromochloride emulsion made after the formula given by me on page 36 for the new rapid printing paper, I took one plate and cut it into four little squares, and exposed behind a negative four inches from a gas flame, and each piece had respectively twenty, forty, sixty, and eighty seconds. I also took another $3\frac{1}{4}$ -plate, but not cutting this, made four similar exposures from the same negative. The exposed plates were all placed in a restrained developer to produce red tones, and, as each appeared of the correct density, was taken out, the piece having eighty seconds coming out first, and having a red tone, each successive plate losing the red and becoming browner, till the 20" one was sufficiently developed, which was of a pleasing brown, but not black, as was the case in Mr. Debenham's experiments. The other plate, with the four exposures, was taken out the same time with the 20" one, and all the exposures found to be of the same tone—namely, brown. Why the red colour should have vanished it is hard to conceive, as one would imagine that as the developer got weaker and absorbed the bromide and chloride from the plate, it should reduce the silver still more finely; instead of that, it makes it coarser the longer it is allowed to remain. These experiments should be made by every one before experimenting with the new printing paper, as it will enable one to learn what exposure and development are necessary to procure a red tone, so essential if the pictures are to be toned.

Mr. Debenham's experiment has certainly thrown much light on my experiments in making lantern slides. I never could find out the reason why at one time, with a given developer, I could procure red tones, and at another, using the same developer, only brown and greenish-black. I always was abusing the poor developer, little thinking

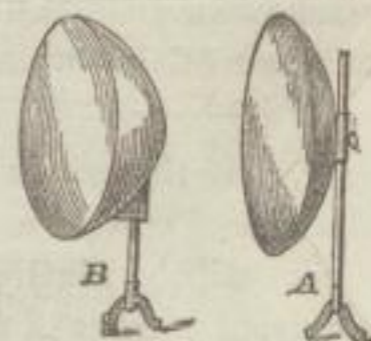
that the exposure and length of stay in the developer had really more to do with it than anything else.

Mr. Debenham, in his article, seems to infer that it is necessary to prepare the plates with a strongly acid emulsion, in order to produce red tones, alluding to my transparencies. If he will refer to my article in the YEAR-BOOK for this year, on page 45, it will be seen that after mixing the emulsion, it is strongly alkaline, free ammonia being liberated from the ammonio-citro-nitrate solution as soon as the bromide of silver is formed. Brown, ruby, and claret-coloured transparencies, have been shown by me at the various societies in London made from this very formula. It requires less care in the mixing if the emulsion is strongly acid, and leaving out the ammonia altogether, and by this means red tones are more easily obtainable, but the emulsion is much slower by this means.

A great deal depends on whether the gelatine has been thoroughly dissolved or not before mixing. I find it best to raise the gelatine solution containing the bromide to a temperature of 180°, and then allow it to cool down to 150° before adding the silver to it, thus ensuring that it has been perfectly dissolved. I believe many failures can be attributed to the gelatine being insufficiently dissolved. The more perfectly that gelatine has been dissolved, the easier is it to seize upon the particle of bromide of silver the instant it is formed, and thus encase it, and so keep it in a fine state of division, which is such a desideratum, whether it be for a warm-toned transparency or a rapid plate which is to be boiled. I believe Mr. H. S. Starnes has pointed this out before.

A Dictionary of Photography.

BACKGROUND (*continued*).—For portraiture in the so-called Rembrandt style, Kurtz and others have found it very advantageous to make use of cup-shaped backgrounds, and these may be made either of thin metal or *papier maché*. Cup-shaped backgrounds take up a good deal of space, and few can afford room enough to keep at hand such an assortment as shall afford much variety with respect to tint and the degree of concavity. Our subjoined cut shows the usual method of mounting a cup-shaped



KURTZ'S CUP-SHAPED BACKGROUND.

background, and it is scarcely necessary to say that the background in the form represented is only adapted for head and shoulder portraits.

It is not a very uncommon thing to see a large flat circular background, which is gradated from light to dark, mounted on a foot like the Kurtz background. This arrangement is very easily made, as an ordinary fabric stretched on a light wooden hoop can be used, and the painting of the face should be done according to Mr. Ashman's directions, as already quoted in this article; but the background in question must be so mounted that it can not only be raised or lowered, but also turned on its axis; this capability of double adjustment giving the photographer great facilities for throwing any part of the figure into special contrast.

Next after the plain background, or one simply gradated, comes what may be termed the pictorial or scenic background; but these are far less used than formerly. Excellent designs in backgrounds can now be obtained commercially, but notwithstanding this, there is a growing tendency among photographers to depend on themselves for the making of background designs. The advantage of being able to frequently vary the backgrounds from time to time needs no comment, as few circumstances give such an air