oxide? In fact this is what takes place when neutral chromate of potash is added to a neutral salt of sesquioxide of chromium, a chromate of chromium is precipitated in the form of a yellowish brown powder. According to this view then the brown binoxide of chromium $Cr\ O_2$ would be represented by the formula $Cr_2\ O_3$, $Cr\ O_3$ which equals $Cr_3\ O_6$ or three times $Cr\ O_2$.

This, then, the formation of brown chromate of oxide of chromium, is the first result of the action of light upon a mixture of bichromate of potash and organic matter, and occasions the brown tint left behind in the paper when the chromate of potash and the carbonate of potash (the carbonic acid being derived from the oxidation of the carbon of the paper) is washed out. If the action of light is allowed to proceed further, the deoxidation ultimately proceeds to the greatest possible extent, and the chromic acid is entirely reduced to the state of sesquioxide of chronium. This has a green colour, and its presence may often be observed in photographs printed in this manner. The reduced brown oxide of chronium, just mentioned as having the properties of a salt, reacts in several ways, like a combination of an acid and a base, and when washed with various metallic and other solutions, gives rise to other insoluble metallic compounds of various colours, by a process of double decomposition. Hence the numerous bichromate of potash printing processes in which variously coloured positives are produced. So far, then, for the action of bichromate of potash upon paper under the influence of light.

Upon gelatine, in its numerous forms of gelatine, isinglass, glue, and the allied bodies, gum, &c, another action takes place at the same time. The reduction of the chromic acid is effected in the same manner, but the oxygen which it loses attacks the gelatine and converts it into a slightly different chemical substance, rendering it partially or entirely insoluble in water, and unacted on by that menstruum.

DOUBLE OR FANCY PRINTING.*

BY R. HARMER.

In complying with the request of your Committee, to describe the method I adopt in double or fancy printing, I will endeavour to be as practical as possible in what I have to say. The proofs in illustration I have purposely taken from the same negative.

The first I would call your attention to is printed as the negative gives it—such a print as I should receive were I to send out the plate and order a dozen to be printed. You will see that it has an amateur background of brown paper, rough and inartistic. It was taken out of doors. This being altogether unsatisfactory, we proceed to make a vignette of it, for which purpose I prefer placing in front of the glass a piece of brown paper, with an aperture filled in round the edges with wool, considering that a much more artistic vignette is produced in this way than by using the vignette glass, which merely gives a shaded oval. With the paper vignette you can, during the printing, enlarge the aperture and vary the effect.

While making these remarks I must beg of you to imagine that a vignette proof has been printed, which I now remove from the frame, and in place of it put a mask of black paper and again place the print in a frame. The parts required to be kept from the action of light are covered by a small piece of wool, which may be made to adhere to the glass by slightly damping as far as the outline of the figure. The wool should then be pulled out to a thin film, to ensure softening into the tinted ground about to be produced. The frame is now ready to be exposed again to the light, which should be done in the shade, as it gives greater control over the tint, and the necessary softening of it into the vignette. Two or three minutes (keeping it moving all the time) will generally be found sufficient to produce the depth of tint required.

The proof now shown will be the result. Other shapes for the masks will suggest themselves, this being entirely dependent on the taste of the printer. Should fancy lead you still further, it may be done by preparing an ornamental design, bearing in mind that what is black in the design will be white in the finished proof. The ornamental mask thus prepared, nothing remains but to use it in the same manner as the mask of black paper before described. Practice will alone tell the depth necessary to print. One tint and one shape will, as a rule, give the best results; the danger to avoid is over-doing it.

I do not think that this style of printing will be of much value commercially, on account of the care and attention required; but to amateurs whose negatives, for want of the necessary appliances, are imperfect, and who desire to make the best of them, I would recommend them to give it a trial, feeling assured they will find an opportunity for the display of artistic taste, and, at the same time, save many of their negatives being cast aside as worthless.

For the information of some who have been making inquiries as to when I first made use of this style of printing, it was when photography was styled photogenic printing. Leaves, lace, and feathers, being about the only objects copied, my first vignette was a leaf, and when printed, a perforated card, with a lace border, was laid over it, and again exposed to light, which I presume may be called double printing. This must have been about twenty-five years since, so that there is nothing new in it; it is merely revised with improvements, and very possibly others may have done the same thing.

It is a frequent occurrence, both in science and art, for two individuals to be working out similar ideas. I was struck with this on reading in last week's PHOTOGRAPHIC NEWS a letter from America by Mr. Thompson, in which he states that Mr. Moran, of Philadelphia, had made some moonlight pictures by double printing; singular to say, some months back I prepared the cloud sketches now shown for the same purpose, but have made no use of them for want of a suitable negative—a negative which prints hard, giving a white sky, would be suitable for the purpose, and no doubt some fine effects may be produced.

In conclusion, I have to thank you for your attention; and if I have omitted describing anything with sufficient clearness, I shall be pleased to answer any inquiries.

* Read at a meeting of the South London Photographic Society, May 14, 1863.

RESEARCHES ON POSITIVE PAPER.

BY DR. SCHNAUSS.

I PUBLISHED, in the *Moniteur de la Photographie*, during the year 1862, an article, "On the Effects of Affinity in Photography," and among other operations, I spoke of gold toning. I endeavoured to show that the photographic proof, or a piece of paper prepared photographically, exposed to the light for a certain time, contains on its surface silver in the metallic state, that is to say, perfectly reduced. Similar researches, I know, have been frequently made, but not from the point of view I take in seeking to establish that in toning, by means of the alkaline gold toning bath, not only is the gold deposited upon the paper, but that also an equivalent quantity of silver is converted into chloride of silver, in the same manner as when a metal is separated from its solution by another metal which is more strongly electro-positive. It is only pure metallic silver that can accomplish this, and not sub-chloride of silver. My researches were not then sufficiently complete, because they formed only a part of a more important work, intended to establish the effect of affinity in photography *in general*. Nevertheless, this part has attracted much attention and contradiction. For this reason I have been induced to repeat and complete my researches. MM. Girard and Spiller, especially, have thrown doubts on my assertion that