Berlin blue and hydrocyanic acid; in the light, the process is much more rapid.

Ferricyanide of potassium with perchloride of iron (equivalent proportions) is also very unstable in darkness. At first, Prussian blue is formed, subsequently (after three months' exposure to light) Prussian green; this precipitate yields, after decomposition with potash, ferrocyanide as well as ferricyanide of potassium. Excess of perchloride of iron forms Prussian green at the beginning. In the light the action is about three times quicker than in darkness. With excess of ferricyanide of potassium, blue is first formed, then green. Hydrocyanic acid is produced at the same time (even in darkness).

Dissolved nitroprusside of sodium, the sensitiveness to light of which has been long known, is about twenty times more sensitive than ferricyanide of potassium. Berlin blue and hydrocyanic acid are formed in the light, and the solution acquires a strong acid reaction.

Nitroprusside of sodium with perchloride of iron is about twenty times more sensitive to light than the first alone, and approaches the sensitiveness of ferri-oxalate.

The following table gives the relative quantitative decomposition of the various substances in 40 ccm. of solution at 3 per cent. after four days' exposure to light:—

1. Iron-ammonia alum + oxalic acid gives 0·028 grammes of iron oxide (present as oxalate).
2. Iron-ammonia alum + citric acid gives 0·015 grammes of iron oxide (present as citrate).
3. The double peroxalate of iron and potassium gives 0·022 grammes of iron-oxide (present as oxalate).
4. Ferric oxalate gives 0·036 grammes of iron-oxide (present as oxalate).
5. Nitroprusside of soda gives 0·002 grammes of Prussian blue.
6. Nitroprusside of soda and perchloride of iron give 0·039 gramme of Prussian blue.
7. Ferricyanide of potassium and iron-alum* give 0·004 gramme of Berlin blue.
8. Ferricyanide of potassium and perchloride of iron yield in the light 0·039 gramme of Berlin blue.
9. Ferricyanide of potassium and chloride of iron (in darkness) give 0·022 gramme of Berlin blue. Difference = 0·017 gramme.

10. Iron-ammonia alum and sugar }
11. " " alcohol } no reduction.
12. " " urea }

Iron-alum with oxalic or citric acid decomposes more slowly than ferrioxalate. It is, however, worthy of remark, that perchloride of iron with oxalic acid decomposes more rapidly in the light than ferric sulphate (in the form of the ammonium double salt). With oxalic acid in this case, therefore, the relative photo-chemical decomposition of the chlorides exceeds that of the oxides. Perchloride of iron with alcohol decomposes quickly in the sun, with the formation of chloride of iron; persulphate of iron with alcohol is permanent in the light.

(*To be continued.*)

CAUSE AND PREVENTION OF FRILLING IN DRY PLATES.

BY P. F. REINSCH.

It is a recognized fact that even with the best gelatine dry plates, and with all the care that may be employed, frilling and blistering will sometimes show themselves after fixing during the washing. The cause of this defect in the gelatine film has often been discussed, and without, however, sufficient ground being given, or a satisfactory remedy being supplied. In the course of experiments I have succeeded in discovering the cause of frilling. A fixed plate was washed with water from the cistern which had been filled with ordinary spring water having a temperature of about 16° Cent., the temperature of the dark-room being about 21·5° Cent. Soon small frillings formed at the edge of the plate, which, during continued washing, increased until the film was covered. A second plate of the same size was then washed in the same dark-room with a stream of water the temperature of which was identical with that of the room, viz., 21·5° Cent. On this plate, one of the same make, no trace of frilling was discoverable.

This experiment shows that even so slight a difference of temperature as 3·8° Centigrade is sufficient to cause frilling.

* This mixture suffered so little decomposition during the time specified in darkness, that no precipitate that could be weighed was formed.

ARTISTIC FEELING IN PHOTOGRAPHY.

BY A. H. WALL.

Part VI.—On the Treatment of Skies and Clouds

As I take pen in hand to deal with this section of my subject, I recall, with a smile, one of the earliest crusades against the inartistic in photography with which I happened to be connected. It began, I think, in 1859 or '60, at the South London Photographic Society—at that time in *its* beginning—and was projected against the then common practice of substituting for skies and clouds, bare, blank, flat, masses of opaque white paper. By thus leaving nothing at all where air and light should play their most important and prominent parts, it was actually believed by whole hosts of operators that a landscape photograph was wonderfully improved! All kinds of ingenious dodges were introduced to "stop out skies" in the negative, so that the pure and perfect blankness of the paper should not be destroyed. For my poor part, I made a vigorous onslaught, and luckily, not without some effect, inasmuch as most of the more active, tasteful, and prominent members of the "societies," backed by the journals, seconded the effort, which at last so prevailed that "white *skies*," as they were comically called, instead of being the rule, became the exception, and are now, I suppose, quite unknown.

Then came the days of "printed-in skies," with clouds made on the printing with—Heaven bless the mark!—cotton-wool. To some extent this was improvement. The over-powering mass of staring white did not throw all the tones of the landscape utterly out of keeping, robbing the high-lights of their luminousness, and, by contrast, making the heavier cast-shadows look unnaturally black and heavy; but they were no more like air and light than the white paper "skies" were. You saw at a glance that they were artificial. They were, indeed, glaringly so, being altogether due to the operator, and entirely unconnected with what the lens gave. How could there be anything in common with a pulled-out piece of cotton-wool laid on a flat-toned surface, and that exquisitely wonderful and beautiful region of ever-varying depths, surfaces, forms, and effects—the sky?

The light and shade of clouds are wonderfully subtle and expressive in their gradations, and always full of pregnant meanings. They accumulate in endless diversity of expressive forms, a vast universe of changeful beauty, alike glorious in the grandeur of their larger masses, and in the tender delicacy of their most diminished forms. They have, of course, their aërial and linear perspective; their outlines and their surface variations, marked by high-lights, half-tones, and reflected lights, all indicating the chief governing influences of the landscape, such as the source and kind of illumination, the atmospheric conditions which rule in the picture's more prominent and powerful effects, and with which, I need hardly say, they should always be in natural harmony. How could all this have been obtained with cotton-wool and a "printed-in sky"? Yet it was once a very common belief that they could be so obtained, and I remember some good folk were almost angry—indeed, some were quite—with those who said they couldn't.

Blunders of the same kind are not, however, confined to