that the addition of 10 and even 20 per cent of glycerine will not completely prevent the dusting of the acid on beating the cotton. The above proportions furnish a wadding impregnated with 10 per cent of salicylic acid; this strength and a wadding containing four per cent are most generally employed.—*Zeitsch. Oester. Ap. Ver.*

ACTION OF LIGHT ON PURE AND COLORED SILVER BROMIDE.

By HERMAN W. VOGEL.

THE results of the investigation are thus stated

1. Pure silver bromide when exposed long enough to a spectrum which is light enough, is sensitive as far as the ultra red.

2. Methyl violet and cyanin both increase the sensitiveness of silver bromide for those parts of the spectrum which they absorb.

3. The plates may be best colored by pouring an alcoholic solution of the coloring matter upon the prepared silver bromide plate, and then allowing to dry.

4. If the plates are too strongly colored, too much of the light is absorbed before reaching the silver bromide. This difficulty is most easily overcome by exposing the back side of the plate to the light, which thus first reaches the silver bromide.

VORTEX SMOKE RINGS.

At one of the recent *conversazioni* of the British Association, Sir W. Thomson exhibited the vortex smoke rings. A box of about 3 feet square has a circular hole of about 6 inches in diameter cut in its front face, and the back is covered by a piece of tightly stretched canvas or linen. The vapors of ammonia and hydrochloric acid are admitted to the box, which soon becomes filled with the white smoke of chloride of ammonium. A sharp but gentle tap on the canvas back drives out a puff of the smoke, which traverses the room in the form of a beautiful ring. So great a velocity can be imparted to these vortex rings that even when at a considerable distance they have sufficient velocity to extinguish candles. The experiment is remarkably simple, and with a little care in securing good ventilation, it may be performed without injury to persons or things in a drawing-room.

HOW TO USE PHOTOGRAPHIC BACKGROUNDS.

By L. W. SEAVEY.

[With Fourteen Illustrations. Continued from page 766.]

HERE is another position (No. 8), one of repose. Here the figure is well relieved by the shadows in the background.

The lady is supposed to be leaning, if that term may be applied, against the shadow that is produced by an accessory.

Under the head of *peculiar* positions, where the background plays an important part, you have in No. 9 that which is known as a circular composition, in which the background is used to carry out the line of the figure.

FIG. 8.

Now, as to some of the errors I have noticed in using backgrounds. Here is one you may see in the Russian department of Photographic Hall, a landscape, and the subject has been so placed that a tree appears to be coming right out of the top of the head. (No. 10.)

Here is one in the American department, in which you have what may be called the pyramidal composition! (No. 11.)

I have an incident to tell you, which I think has never been told. Some two years ago I received a letter from a stock-house in Philadelphia, ordering a landscape sea view background, one which we designate as the *Evangeline*, which some of you know; also for a rustic arbor and fence. Quite a little bill! The photographer had been successful; he thought he would invest some money in backgrounds and accessories. The order was filled at my establishment, and being shipped to the stockdealer we did not know who finally received it. About a month afterwards I was making a short tour through the country, calling on my photographic friends for the purpose of drumming up business. I was very much surprised one day, on entering a gallery, at seeing a background, which in color made me think it had been executed either by myself or by one of my artists; but the design was something new to me, I had never seen anything like it before. The rustic arbor and fence I recognized at once. After a moment I comprehended the matter. The photographer had, in mounting the background, turned it so that the horizon line was vertical; he afterwards told me he could not tell which end should be up, so in his dilemma he called in his friends and they had a regular consultation, and finally concluded that a point of land extending into the water was a church steeple, and therefore it should be placed in the way in which I found it.

I will make a sketch of the background, showing the effect produced by the manner in which they placed it. (No. 12.)

When he posed his subjects he put them directly under that line (indicating). I have frequently seen the old-fashioned base-boards in front of landscape backgrounds; they should never be used with even plain or interior backgrounds. I hardly need mention this to you, for I am sure those present never make such mistakes. If possible, the junction of the background and floor should be hidden, either by shadows

FIG. 9.

or by placing an accessory to hide the line. The foregoing is essential in order that the picture may have a realistic appearance.

Occasionally a customer, on seeing a proof, complains that the hair sticks out (No. 13), or something else sticks up, and you reply that you do not photograph hair and bows. I claim that you do photograph them. I claim that it is the duty of every photographer to look at the personal adornments of the subject, and arrange them with the same degree of care that

FIG. 10.

FIG. 11.

an artist in a studio does in posing his model for a picture which he desires to paint.

If a lady enters a gallery having ribbons and bows over the top of her head, I think it would be hardly proper to make them look like this (indicating), or letting them stick up so (No. 14) (indicating). (Applause and laughter.) The photographer holds a very important place in the com-

FIG. 12.

munity in which he is located, especially when he puts out his sign as an *artistic* one. The people look to him as the leader of and authority on art in their particular neighborhood. I don't know whether all realize it or not. You represent their friends, their homes, and their families, and they

are dependent upon you, and it is your duty to elevate the artistic tastes of the community and thereby benefit yourself by interesting them in your work.

I wish to say something about the Photographic Convention. The photographic conventions or exhibitions are to me a source of valuable instruction. By them about the only opportunity is afforded by which I can ascertain your standing, by which I can see how my backgrounds are used, or how you have improved upon my efforts. Our welfare is mutual. And if I make mistakes, as I frequently do, you should point them out in a friendly and kindly way, and allow me to do the same when you have erred.

At the conventions I examine the pictures carefully, to see how my backgrounds have been used. I often see instances where they have been well used. Valuable suggestions are made to me, and if I see good result I make a memorandum or sketch of it, and lay it away for future reference. I have, at this Exhibition, obtained quite a number of new ideas, which in the course of time will be scattered abroad in works going to you from my studio.

Occasionally I receive letters finding fault with my backgrounds, that they are not dark enough in the shadows, or that they are too light; and I have occasionally sent for proofs: and in several instances where the complaint had been that they were too light, have found the photographer had been using the background turned somewhat towards the side-light. We have great difficulty in painting backgrounds to make the shadows as intense as they are in nature. It is really impossible. As the photographic value depends upon the relative degree of light and shade in the background, it should be placed at right angles to the side-light or with the side-wall of the room.

FIG. 13.

FIG. 14.

Mr. Whitney, of Norwalk, here asked what style of background Mr. Seavey would recommend for heads and busts.

I think, for these purposes there should be no design in a background, except of a simple arrangement of light and shade. For bust work it should be darkest at the bottom, growing gradually lighter towards the top. I think, in bust pictures, the background should be so retiring that the spectator will not notice that a background has been used.

I wish to say about skylights, that most of you make your skylight rooms so small that you have not room for more than one or two backgrounds, with scarcely any accessories. What would be thought of the portrait artist, or of the painter of figure subjects, were he to paint one background which would be found in every picture coming from his easel. You should have room for several backgrounds for producing different kinds of pictures in vogue, and room for your accessories, so that you may use them without being annoyed or worried by having them in the way.

At the conclusion of Mr. Seavey's address, he was complimented by the president and others, and a vote of thanks tendered him for the admirable manner in which he had shown the use and workings of backgrounds.

TRANSPARENCIES AND ENLARGEMENTS.

THE great drawback heretofore felt in making transparencies, and enlarged negatives therefrom, has been the "fuzziness" or blurred appearance of the resulting picture. Where a transparency is made in direct contact with the negative by any of the known dry-plate processes (if contact is perfect), no blurring will be perceptible, and the resulting transparency will be as sharp as the original negative. Now take this transparency and use it for an enlarged negative by any means I have seen recommended—namely, place in front of your object-lens and pass the light through it, either direct from the sky or reflected from a white screen, and in proportion to the diameters will be the blurring of your resulting negative. I have found that all this can be avoided by placing in front of the negative you wish to make transparencies from, either for the lantern or duplicate, or enlarged negative, first next to the window, or, better still, clear daylight, a porcelain plate (a thin one); next to this two or even three thicknesses of (finely ground) ground glass, ground side out. Inside of this place your negative, collodion side to the object glass; focus with full, open tube, and, before exposing the plate, insert small stop. The result will be a transparency or negative free from all blurring, sharp and clear as the original negative. Now place this in place of the original negative, and proceed to make your enlarged negative.

I never have seen this idea mentioned by any one, but all who will try it will at once be convinced of the great advantage to be gained by the use of porcelain and ground glass, as already mentioned.—A. HESLER.

MICROSCOPIC OBSERVATION OF MINUTE OBJECTS.

At the meeting of the Academy of Sciences of Philadelphia (May 9), Professor Frazer remarked that he desired to put on record a thought relating to Helmholtz's now famous establishment of the limit of vision through the microscope. As this limit was determined by half the length of a wave of light, and since the wave-lengths of the most refrangible rays of the light spectrum (that is, the violet) are somewhere near the $\frac{1}{10000}$ part of an inch, the conclusion was reached that nothing more minute than the $\frac{1}{20000}$ part of an inch could be seen. But actinic waves or others of smaller length (of greater refrangibility too) in passing through a substance on which are lines or other markings less than $\frac{1}{10000}$ inch apart, may be altered to light waves, and become visible, provided that the substance through which they pass is capable of fluorescing—that is, increasing their wave length—and provided the distance apart of the marks to be seen is not less than one half the wave-length of such actinic waves.