with the glass in the skylights not particularly pale; also, from the great depth of focus rendered necessary by the dimensions of the machine, and often the practical difficulty of getting a clear view, and of retiring with the camera to a sufficient distance. Some of these requirements are identical with those involved in the taking of drill pictures of considerable size; when, for instance, an artillery detachment is grouped far and near around the gun, and some are engaged in the act of loading with heavy shot, or implements in hand, which renders it difficult to remain perfectly steady for more than a few seconds. Under these circumstances, the optician will recognize a certain degree of difficulty in so accommodating the lens as to take the entire group with rapidity and tolerably uniform definition. A lens well adapted for this kind of work has been recently prepared for us by Mr. Dallmeyer. It is a single objective of four inches diameter, and about eighteen inches focus, and may be used with a one-and-a-half-inch stop. The aplanatic lens of Mr. Grubb, of Dublin, appears likewise to answer well for these purposes. In cases where a larger exposure is possible, the "triple-achromatic" of Dallmeyer has given us great satisfaction, and with this lens there is no difficulty in getting both the foreground and distance well defined.

## Correspondence.

### FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

*Paris, December 9th*, 1863.

AT the last meeting of our Photographic Society, the following letter from M. Marion was read:—

I have the honour of submitting to the *Société Française de Photographie* a new process for printing positives without salts of silver or gold, the sensitive agents of which are the red prussiate of potassa and citrate of iron combined. The invention of this process is due to M. Motileff; but certain modifications we have made in the preparation of the paper render it, we believe, more sensitive. To obtain brilliancy in the albumen, we have worked in concert with M. Motileff. We place at the disposal of the members of the society present at the meeting some samples of this paper, that they may experiment on the process and afterwards give their opinion upon it.

This paper is exposed in a printing-frame under a negative for 30 or 40 minutes in the sun, and after being satisfied that the proof is sufficiently strong, it is washed in ordinary on water, and the operation is concluded; the picture, which, on being removed from the printing-frame is sticky, is cleared in the washing from the veil that covers the details, and in a few minutes it acquires the brilliancy and delicacy of tint of the finest Prusian blue, with the lights perfectly pure.

To tone this blue picture a black, it is immersed in an alcoholic solution of caustic potassa, 1 part to 300 parts water. The blue proof must remain in this bath until it becomes yellow, which takes place in one or two minutes. It is then well washed in ordinary water, and then we pour on the yellow picture a small quantity of the following alcoholic solution:—

| | |
|---|---|
| Alcohol (40°) ..... | 100 parts. |
| Gallic acid ..... | 8 „ |

In a few seconds, we perceive the yellow picture change to inky black, and acquire great vigour; it is then dried without being washed, and is thus both toned and fixed.

I believe that the toning of the blue proof to a black requires to be studied; it demands the attention of all who are engaged in photography, for it contains questions of the greatest interest. First, in the economy of production of the proof, which cannot be denied, and next, the permanency of the pictures, a more delicate question, which cannot be solved until after numerous experiments by a great number of persons, each bringing his tribute of art, knowledge and skill.

M. Leon Vidal, of Marseilles, has completed and will soon publish a work the object of which is to show how the time of exposure in the camera may at once be ascertained, with a given focal distance, diaphragm, and definite luminous intensity. His aim is to effect an appreciation of the luminous intensity at the moment of operating, and then to calculate, on the basis of this measured intensity, the time of exposure, with a given focal distance and diaphragm.

These calculations are put into a table, giving all the mean durations of the times of exposure in hours, minutes, and seconds, for focal distance, from 1 to 100 centimetres, with diaphragm of 1 millimetre to 20 millimetres in diameter.

This photometric table is calculated on the following basis, verified experimentally:—A simple ¼ plate objective, in the best condition of light, requires one minute's exposure upon dry collodion, with a focal distance of ten centimetres (4 inches), and a diaphragm of 5 millimetres in diameter (one-fifth of an inch). Starting from this basis, and supported on these two laws—1st, that the intensity of light on the unit of surface varies in the inverse ratio of the square of the luminous point from impressed surface; 2nd, that the intensity of light varies in the direct ratio of the square, of the diameter of the diaphragm giving access to the light. M. Vidal has established, mathematically, the time of exposure upon dry or wet collodion, whatever the intensity of the light, always taking into account the diaphragms and local distances employed. These calculations are applicable to every kind of objective, single or double. On this subject, M. Vidal again expresses the wish that opticians and makers of apparatus would mark the focal distances of the lenses on their tubes; upon diaphragms, a number indicating their diameter (in 10ths of an inch), and on the base of the camera and its extension, the graduated metrical distance, starting from the front containing the objective. In this manner a simple inspection would always permit the operator to ascertain under what mechanical conditions he is operating.

The photometer presented by M. Vidal to the Photographic Society of Marseilles, on the 8th of October, 1862, is based upon the colour albumenized paper assumes, by the chemical decomposition of its chloride of silver. The scale of graduation is concentric with a strip of sensitive paper, of which only a portion is exposed to light through an aperture easily uncovered. The graduated scale is composed of ten tones, arranged in such manner that each increases a degree from that obtained in six seconds in the best conditions of light to that obtained in one minute or sixty seconds, so that we thus have the series of tones obtained in from six to sixty seconds. The operation consists in measuring the intensity of the light in the open air, always done in the shadow of the body of the operator, standing with his back to the sun. The duration of this operation is one minute, measured by a sand-glass. It is easy, during the operation, to bring the eye to compare the tones on the exposed paper with those which best correspond with that obtained by the chemical action of the light of the moment. The appreciation is very easy, and if error were possible, it would be only in the series of the last five tones, in which case a hesitation between two consecutive tones would cause but a very slight error, which may be overlooked. The degree of light being known, it becomes easy, table in hand, to deduce from it the time of exposure, the numbers of the table being based upon the No. 10; that is to say, upon the best conditions of light.

### CHROMOPHOTOGRAPHY.

SIR,—In No. 273 of your journal, Mr. Busch has criticized unmercifully my little discovery in Chromophotography, regardless of the favourable opinion expressed by some, whose names are of note in the photographic world.*

*1. "Phio del fotografo," by J. G. Sella, new edit., 1863, page 466:—"Il Colonnetto Baratti, per colorare le prove propone l'uso di soluzioni," etc. . . . . "Le immagini cosi trattate quando sono fifrate nell' iposolfite, sono di grande effetto peretré la tinta e gradazione di esse, *non e monotona*