

# THE PHOTOGRAPHIC NEWS.

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## PROFESSOR LIPPMANN'S NEW DISCOVERIES IN HELIOCHROMY.

SINCE last Friday some additional particulars about M. G. Lippmann's discoveries in relation to photography in natural colours have come to hand, and we give them in the order in which they have been received, reserving comment until the end.

The facts were first made known on the second of this month, at a meeting of the French Academy of Sciences, under the presidency of M. Duchartre, and much about them was published in these pages last week. The following is the notice of the meeting published in last week's *Nature* :—

### ON PHOTOGRAPHING IN COLOURS, BY M. G. LIPPMANN.

The conditions said to be essential to photography in colours by M. Lippmann's method are: (1) a sensitive film showing no grain; (2) a reflecting surface at the back of this film. Albumen, collodion, and gelatine films sensitised with iodide or bromide of silver, and devoid of grain when microscopically examined, have been employed. Films so prepared have been placed in a hollow dark slide containing mercury. The mercury thus forms a reflecting layer in contact with the sensitive film. The exposure, development, and fixing of the film are done in the ordinary manner; but when the operations are completed, the colours of the spectrum became visible. The theory of the experiment is very simple. The incident light interferes with the light reflected by the mercury; consequently, a series of fringes is formed in the sensitive film, and silver is deposited at places of maximum luminosity of these fringes. The thickness of the film is divided according to the deposits of silver into laminae whose thicknesses are equal to the interval separating two maxima of light in the fringes—that is, half the wave-length of the incident light. These laminae of metallic silver, formed at regular distances from the surface of the film, give rise to the colours seen when the plate is developed and dried. Evidence of this is found in the fact that the proofs obtained are positive when viewed by reflected, and negative when viewed by transmitted light—that is, each colour is represented by its complementary colour.—Observations by M. E. Becquerel on the above communication. M. Becquerel called attention to the experiments made by him on the photography of colours in 1849. His researches, however, dealt more with the chemical than the physical side of the question.

Last Monday we received a letter from our Paris correspondent, M. Léon Vidal, in which he says that he has had occasion to see M. Lippmann, who has shown him his results; he then had a better opportunity of

examining them than was the case with those exhibited at the Photographic Society of France, and the spectrum was very well rendered in those which he saw at the Sorbonne. M. Vidal adds that when M. Lippmann possesses plates sensitive to the red rays, and when his present results are improved upon by experience, the images will be more complete; moreover, it remains to be seen what will take place when he uses compound colours, above all with a mixture of white light. He has made a beginning, and new developments must be patiently awaited; he will not be dilatory in the work. One result attained by the experiments of M. Lippmann is, that the polychrome impressions obtained by M. Becquerel, and by his imitators, Niépce de St. Victor, Poitevin, and others, appear all to be due to the physical phenomena presented by the interference of light; this is one of the most curious consequences of this fruitful discovery.

M. Vidal says, in a letter which we received yesterday, that, so far, those plates have worked best in M. Lippmann's hands which were prepared by the old Taupenot process; such dry plates, some of our readers may remember, had upon them one film of albumen and another of collodion. The plates should be orthochromatic, especially for the red rays, otherwise the time of exposure becomes too long. In photographing the spectrum, M. Lippmann uses an arc light of eight to nine hundred candle power, with the usual condensers, slit, and prisms. The colours presented by the finished photograph much resemble those of the soap-bubble. M. Vidal sends other particulars, but they are the same as those included in a memoir by Professor Lippmann upon another page of this issue.

Up to this date M. Lippmann has not published any definite working formula, but if his hypothesis of the nature of the coloured image be true, it is easy for every photographer to devise his own methods, and we will now give some speculative suggestions on the subject which may or may not hereafter prove to be erroneous.

In the first place, it seems evident that dry plates alone can be used to permanently photograph interference fringes in parallel layers, because any damp film