PHOTOGRAPHY BY A LIGHTNING FLASH.

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[Abstract of Remarks made at the Stated Meeting held November 13, 1885.]

Mr. Albert S. Barker, of Philadelphia, has recently succeeded in taking two very fair photographic negatives of outside objects while illumined by no other light than that of a single lightning flash. These photographic views were taken at 7 P. M. on Thursday, October 29, 1885, near Philadelphia. The night was excessively dark, the wind strong, and the rain heavy. The camera was placed in an open window, with the slide drawn. The lightning flash came in less than one minute, when the slide was returned. The plate holder was then reversed and suitably placed for a second exposure. The plate was one of the highly sensitive gelatine films.

Mr. Barker developed the plates the same evening. From their behavior he rated the actinic effect of the light as equal to that obtained from an exposure of about $\frac{1}{300}$ part of a second in bright sunlight.

The popular impression as to the duration of the lightning flash is that it is practically instantaneous. From the experiments of Wheatstone and others with the rotating disc, the duration of the flashes measured, would vary apparently from the $\frac{1}{1000}$ to the $\frac{1}{10000}$ of a second. Others estimate the duration of the flash as even shorter than these figures.

It is very doubtful if the average severe flash in this latitude does not endure or continue for a very much longer period. Despite the popular belief to the contrary, the author has frequently observed the motion of foliage when illumined by no other light than the lightning flash. This would not, of course, be the case if the flash were even approximately instantaneous.

It is a very significant fact that in the photographs of Mr. Barker the foliage shows unmistakable evidence of having perceptibly moved during the period of exposure; thus showing that it was by no means instantaneous.

It is to be hoped that Mr. Barker, or some other photographer, will repeat these exposures under the following conditions, viz., to make the exposure while the camera is sharply focussed on

moving foliage, or a rapidly rotating wheel, while illumined by a lightning flash, so as to determine more definitely the duration of the flash.

In the case of the lightning flash, the large percentage of blue rays would of course render the plate more sensitive to the extremely short exposure by practically prolonging the same, since the ordinary photographic chemicals now employed are especially sensitive to the blue portions of the spectrum.

It would appear from the facts developed by the photographs, of Mr. Barker that the method of measuring the duration of the lightning flash as adopted by Wheatstone and others, which consist essentially in endeavoring to detect by the unassisted eye the change in position of a rapidly moving wheel, or other object, while illumined by the flash, might be greatly improved by substituting for the eye, the sensitive photographic plate since the latter is apparently far more sensitive than the eye.

Should photographic pictures of a rapidly rotating wheel, whose rate of motion was known, be taken while illumined by a lightning flash, the displacement of the image on the negative would give far more reliable data for calculating the duration of the flash than the methods heretofore employed.

Mr. Barker's photographs, therefore, are not only interesting as showing how extremely sensitive the photographic plate may be made, but are also of interest as throwing some light on the possible duration of the lightning flash.

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ORIGIN OF DIASTASE.—Emile Laurent has investigated the question whether diastase is a product of bacterial action, or whether it can be formed without organic intervention. He placed seeds of lupin, maize, barley and helianthus to germinate under a bell-glass, over water which had been previously boiled, the seeds having been first freed from superficial micro-organisms by the ordinary processes of sterilization. When the sprout began to show, the seeds were introduced, with all necessary precautions, into tubes containing Koch's nutritive gelatine. The seeds continued to develop normally, without liquefying the gelatine, which constitutes, according to Koch, an infallible criterion of the absence of bacteria. Sprouted seeds, introduced into sterilized plum juice, continued to grow, without showing any bacteria in the liquid. Although these experiments can hardly be considered as decisive, they lend great probability to Laurent's opinion that bacterial intervention is not necessary—*Bul. de l'Acad. Roy. de Belg.*, No. 7, 1885.