The results, stated briefly, are as follows: The average pupil-dilatation in six experiments with 1/50 c.c. of adrenalin per kilo animal was 1.62 mm., with a beginning recovery from dilatation in four minutes, and a complete recovery in ten minutes.

In six experiments with 1/30 c.c. there was an average dilatation of 2.25 mm.; recovery began in eight minutes and was complete in twenty-eight minutes.

In thirteen experiments with 1/20 c.c., there was an average dilatation of 3.61 mm.; recovery began in six minutes and was complete in thirty-seven minutes.

In eight experiments with 1/10 c.c., there was an average dilatation of 3.87 mm.; recovery began in ten minutes and was complete in forty-nine minutes.

Finally, in eight experiments the dosage was 2/10 c.c. Here the average dilatation was 4.25 mm.; recovery began in twenty-five minutes, and was practically complete in an average of one hundred and eight minutes.

In other words, 1/50 c.c. of adrenalin per kilo animal was practically the minimum amount that could be relied upon to give a definite dilatation; as the dosage of adrenalin was increased, the dilatation also became greater, remained at its maximum for a longer time, and the return to a normal diameter was slower.

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Intermittent and continuous lights of equal intensity as stimuli.

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It is generally assumed that white lights of equal intensity give equal stimulation. We have attempted to ascertain whether there is any observable physiological difference between the action of continuous white light and intermittent white light of equal intensity. From a common source of light two beams were conducted over separate paths of equal length to a common observation point. One beam passed through a narrow slit and was thus reduced to a continuous stream of light of low intensity. The

other beam was reduced by being passed through a revolving sector-wheel, thus giving rise to a succession of flashes and dark intervals which fused indistinguishably in the eye, producing the appearance of a continuous flow of light of low intensity. By adjusting the sector aperture and comparing the lights in a photometer, the two lights could be made physiologically equal. On measuring the physical intensities of the two physiologically balanced lights by means of a radiomicrometer, the intermittent light was found to be about 6 per cent. stronger than the continuous light. When the two lights were made equal from the standpoint of their physical intensity and were compared in a photometer, the continuous light appeared much brighter than the intermittent one. From these results we conclude that intermittent white light is a measurably less efficient stimulus than continuous white light of the same intensity, and that in this respect the action of the retina, like that of the photographic plate, affords an exception to the Bunsen-Roscoe law. The reduced efficiency of intermittent light is probably the result of chemical induction dependent upon the frequent interruptions of the light. The sector wheel (episcotister) is therefore an unreliable means for reducing the intensity of light.

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Preliminary communication on the cytolytic action of ox-blood serum upon sea-urchin eggs, and its inhibition by proteins.

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1. It has been shown by Loeb[1] that the eggs of sea urchins (*Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus*) may be fertilized by the blood-sera of mammalia, provided the eggs be previously sensitized by a brief immersion in a solution of $SrCl_2$ which is approximately isotonic with sea water.

2. I find that if ox-serum be rendered sufficiently potent by dilution (cf. below) the formation of a fertilization-membrane by

[1] J. Loeb, *Arch. f. d. ges. Physiol.*, 118, 36, 1907; 122, 196, 1908; 124, 37, 1908; "Die chemische Entwicklungserregung des Tierischen Eies," Berlin, 1909, p. 185.