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The inhibition of luminescence by light—Dynamics of the reaction.

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The luminescence of ctenophores is inhibited by light of a given intensity acting for a sufficient length of time. This is true for both the intact animals and for the luminescent substance obtained from them. The following experiments were made with a view to determining the dynamics of this photochemical reaction in the case of the luminescent granules of *Eucharis multicornis.*

A large specimen of *Eucharis* was shaken in a flask until all gross structures had disappeared, and the fluid remaining had the appearance of an opalescent emulsion. This was passed through a coarse filter, the resulting filtrate being a stable suspension of microscopic granules of photogenic material which, when subjected to the action of appropriate reagents, would glow with a blue-green light. In practice this was accomplished by pouring 50 cc. of the suspension into 200 cc. of tap water. The result was a bright light which lasted 5 to 7 seconds—an amount sufficient to produce deep blackening of an "extra rapid" photographic plate (Cappelli's).

In order to study the dynamics of the action of light on the luminescent granules, 300 cc. of the suspension were exposed in a broad dish to the action of a 200 cp. lamp at 50 cm. distance. At chosen intervals, 50 cc. of the suspension was removed, agitated, taken to the dark room, mixed with 200 cc. of tap water, and the photographic plate kept at a fixed distance. After the exposure the plate was numbered, then carefully covered and kept until the end of the experimental series. When the series was finished the plates were put into a large tray, and developed together for the same length of time. In similar way they were fixed, washed and dried.

The opacity, *i. e.,* blackening, of the plate is proportional to the quantity of light to which the plate was exposed. The light given

off when the suspension was mixed with water was in each case a measure of the amount of unchanged photogenic material remaining in the granules. In order to obtain numbers for these quantities, the photographic plates were compared by means of a photometer. The opacity (the reciprocal of the transmission) is proportional to the intensity of the light necessary to match the constant standard lamp. The plate which records the amount of light produced by the 50 cc. of suspension which had not been subjected to illumination, is taken as equal to 100 in each series, and the opacity of the remaining plates calculated as per cents.

In all, four series were completed. Values for identical time intervals were averaged. Calculation of constants according to the formula for a monomolecular reaction yielded the following results:

Time minutes	Opacity per cent. a—x		$K = \frac{1}{t} \log_e \frac{a}{a-x}$
	Obs.	Calc.	
0	100	100	
5	77.5	83	(.050)
10	70	70	.0355
15	56	58	.0375
20	48.5	48	.0355
30	35	33.5	.035
40	20.5	23	.0395
45	17.5	19.5	.0385
55	18	13.5	.031
60	10	11	.038
			Av. = .0363
			Probable error ± .001

The photochemical reaction by which the luminescent material of *Eucharis* is destroyed therefore follows the course of a monomolecular reaction.