ably good agreement with the electrometric values. Details of this work will be reported shortly.

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Some Effects of Ultra Violet Radiation on Hydra.

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In the following experiments an attempt has been made to determine the effects of ultra violet radiation upon Hydra, with respect to (1) physiological difference between species, (2) effects on budding, (3) effects of calcium chloride and magnesium chloride, (4) heat sensitization. All experiments were performed with a Pan Ray Arc lamp with an energy distribution of approximately 15 per cent ultra violet, 59 per cent visable, and 26 per cent infra red, with a total energy equivalent to 1 gm. cal. per sq. cm. per min. at 103 cm.[1] Each organism treated was exposed in a watch-glass containing five centimeters of pond water, placed sixty centimeters from the arc. The total energy of the arc at this distance is 2.94 gm. cal. per sq. cm. per min. The temperature for each experiment was determined by immersing the thermometer in the watch-glass. For the heat sensitization experiments the water in the watch-glass was kept at a temperature which varied no more than 0.5° C. by the use of an electric fan.

Experiment I. Physiological difference between species: (A) Three species of Hydra were used: (a) *H. viridis,* (b) *H. fusca,* (c) *H. dioecia.* Six series of 6 specimens each were employed for the series of tests, making a total of 108 Hydra. Series 1 was left in pond water at room temperature; series 2 was exposed to ultra violet for 15 minutes behind a glass screen 3 mm. in thickness; series 3 was placed in an electric oven until the temperature

was raised from 18° C. to 28° C., a rise of 2° C. more than that which occurred during any ultra violet exposure; series 4 was exposed 5 minutes and series 5, 10 minutes to ultra violet; series 6 was exposed 15 minutes to ultra violet. Series 1, 2, and 3 showed no change, all specimens of the three species remaining normal. The results obtained from the exposures of series 4, 5, and 6 are as follows: (1) series 4, 8 hours after exposure all *H. viridis* and *H. fusca* were disintegrating, while 3 *H. dioecia* were dead and 3 disintegrating. All but three dioecia were regenerating after 48 hours. (2) Series 5, 3 hours after exposure all *H. viridis* and *H. fusca* were disintegrating, and 8 hours after all were dead. All *H. dioecia* were dead 3 hours after exposure. (3) Series 6, all *H. dioecia,* were dead immediately following exposure. Eight hours after exposure all *H. viridis* and *H. fusca* were dead.

(B) Groups of six each of each species, a total of 18 Hydra, were exposed 2 minutes daily to ultra violet for four days. All *H. viridis* and *H. fusca* were disintegrating after third exposure and all were dead 8 hours after last exposure. All *H. dioecia* were disintegrating after second exposure, 2 were dead after third exposure and all were dead after the last exposure.

It is evident that there is a physiological difference in reaction to ultra violet radiation in the three species of Hydra studied, and that *H. dioecia* is less resistant than either *H. viridis* or *H. fusca.*

Experiment II. Effects on budding: One series of 8 *H. dioecia* with buds was treated 10 minutes with ultra violet, and an additional series of 24 *H. dioecia* was exposed 5 minutes to ultra violet, a total of 32 Hydra. In the first series, 9 of the 12 buds were broken from the parent within 3 hours, and all showed partial disintegration. All the parents were dead within 3 hours. In the second series, every one of the 29 buds were broken from the parent within 5 hours, and all were alive after 48 hours. Eleven of the 24 parents were dead after 8 hours and the remaining 13 were regenerating after 48 hours.

The experiments indicate that there is a marked physiological difference between parent and bud of *H. dioecia* in their reaction to ultra violet radiation. The buds appear to be more resistant than the parents.

Experiment III. Effects of calcium chloride and magnesium chloride. Two series of *H. dioecia* with buds, each series containing 18 specimens, a total of 36, were exposed 5 minutes to ultra violet in a 1/8 of one per cent solution of calcium chloride and magnesium chloride, respectively. None of the buds were broken from the parent in either solution; 8 buds of each series disintegrated

with the parent within 8 hours, and the remaining 10 were regenerating after 48 hours.

These experiments indicate that there is a chemical influence exerted by calcium chloride and magnesium chloride on budding Hydra. Further experiments of a similar nature are under way.

Experiment IV. Sensitization to heat: Two series of 10 specimens each, and one series of 20 specimens, a total of 40 Hydra, were exposed to ultra violet for varying periods at a temperature between 19° and 20° C. Two additional series of 20 specimens each, a total of 40 Hydra were exposed to ultra violet for varying periods at a temperature between 19° and 20° C., after which they were heated to a temperature of 28° C. in an electric oven. The results of these experiments show that in the first three series with exposures of 10, 5 and 3 minutes respectively, the per cent of deaths were 100, 50 and 35 respectively. In series 4 and 5 with exposures of 5 and 3 minutes respectively plus a rise in temperature, the per cent of deaths were 55 and 35 respectively.

These results indicate that exposure to ultra violet radiation does not induce sensitization to heat on the part of *H. dioecia.* This is not in accord with the results obtained by Bovie,[2] in which he found that Paramecia exposed to fluorite rays were sensitized to such an extent that they no longer were able to withstand their normal optimum temperature.

The lethal effects of ultra violet radiation on Hydra appear to be due to coagulation of the protoplasm.

This is a preliminary report.

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Sedimentation Rate of Erythrocytes and Plasma Proteins Following Prolonged Chloroform Anaesthesia in Dogs.

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Four dogs were anesthetized with chloroform for sufficient periods to insure liver necrosis. The sedimentation rate of the red blood cells, the albumin, globulin, and fibrin fractions from the plas-