8390 C

Effect of Ultraviolet on Heart of Rana Pipiens and Alligator Mississippiensis.

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Hinrichs and Johnson[1] observed that "short exposures in the region of the sino-auricular node of both frog and turtle produced a noticeable increase in rate." Also, these investigators found that "it has been possible to stimulate the heart of a frog to regular beat, normal in sequence and in amplitude, by radiation at the sino-auricular node after the heart has been quiescent for an hour or more." They did not report any amplitude changes after radiation of the normal heart.

The effect of ultraviolet radiation on the exposed heart of the pithed frog, *Rana pipiens,* and decapitated alligator, *A. mississippiensis,* immersed in Ringer's solution which was kept at a fairly constant temperature of 12-14°C., was observed during irradiation by a Cooper-Hewitt Quartz Mercury Arc or a General Electric S.1 lamp at 50 cm. from the preparation. The former was the source employed unless otherwise stated.

Several series of experiments were performed and the following facts were noted:

1. Freshly prepared normal hearts were found to exhibit a slight increase in frequency and amplitude upon irradiation for short intervals (5-10 minutes) after which both indices rapidly fell below the normal and exhibited a delayed and slow recovery. A normal untreated preparation, under the conditions employed during the course of this investigation, exhibits about a 10% fall in amplitude after 3 to 4 hours while the change in frequency may be regarded as negligible.

Relatively long irradiation (16 minutes) produced a rise in frequency and amplitude and the subsequent rapid fall but, when a long irradiation (63 minutes) was given before the usual slow recovery set in, the frequency and amplitude kept falling. It was not until 2 hours after irradiation ceased that the indices showed signs of recovery and a return to normality.

When a fairly short intense irradiation (8 minutes) and 2 long,

[1] Hinrichs, M. A., and Johnson, P. O. C., PROC. SOC. EXP. BIOL. AND MED., 1930, **27**, 971.

relatively weak ones (1 hour each) from a General Electric S.1 lamp were given it was observed that the short intense irradiation did not affect the preparation deleteriously and thus the responses to the weak, long irradiations exhibited the same effect as was noted to be the case when short, intense irradiations were employed.

2. Several hearts were immersed in cool (12-14°C.) Ringer's solution until they ceased beating. These were then irradiated and they started to beat after from one to 10 minutes of irradiation. On one heart this irradiation procedure was carried on for a period of 70 hours.

3. Records were obtained of hearts which exhibited an abnormal rhythm and it was noted that short dosages of ultraviolet were quite effective in inducing a normal rhythm and this did not revert to the original state after the cessation of radiation. Also, a slight increase in tonus appeared.

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Normal Heart Weight/Body Weight (HW/BW) and Left to Right Ventricular (L/R) Ratios for Rabbits.*

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In order to have adequate controls for further experimental studies upon cardiac hypertrophy we have considered it necessary to accumulate data from a large series of normal rabbits and to treat this data by statistical methods. Many previous investigators have published average heart weight body weight ratios for small series of rabbits, but there are no figures for the ratio of the left to the right ventricular weights. Hasenfeld and Romberg[1] in a control series of 32 normal rabbits found an average of 2.38 gm. of heart muscle per kilo of body weight. Joseph[2] in a series of 38 male and 66 female rabbits found an average ratio of 2.67 in the males with a maximum of 3.42 and a minimum of 2.07, while for the females the average ratio was 2.70 with a maximum of 4.47 and a minimum

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1 Hasenfeld, A., and Romberg, E., *Arch. f. exp. Path. u. Pharm.*, 1897, **39**, 333.

2 Joseph, D. R., *J. Exp. Med.*, 1908, **10**, 521.