

level particularly if the kidneys were removed. Such an experiment was performed. In 3 dogs, nephrectomized 24 hours previously, the intraperitoneal injection of 300 cc. of distilled water caused a drop in the blood chloride levels of 20, 29, and 23 mg., respectively. In 2 similar experiments when salyrgan was administered simultaneously with the distilled water the drop in the blood chloride level was 0 and 14 mg., respectively and in one experiment with euphyllin the drop was 9 mg. These differences, although small, are definitely greater than the errors of the methods of determination and may possibly be interpreted as evidence of an extrarenal action of these diuretics that would tend to aid or augment their diuretic action. In view of the results in the other experiments and of the available data in the literature, we feel that such an extrarenal action is probably of minor importance compared with the action on the kidney insofar as diuresis in the dog is concerned.

5187

Rate of Heart-Beat in Limulus as Affected by Exposure to Ultraviolet Point Radiation.*

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This is the third of a series of studies on heart-beat. Preliminary reports have appeared in this journal, covering experiments with embryos and newly hatched *Fundulus*, and with adult frogs and turtles.^{1, 2} It has been possible, in each instance, to modify the rate of beat by exposure to ultraviolet radiation, using the unscreened spectrum of a Cooper-Hewitt quartz mercury vapor arc running at 110 volts, D. C., focussed through a quartz rod.

The present report deals with experiments on the *Limulus* heart, the beat of which is controlled by a nerve cord which runs along the median dorsal surface of the heart.³ Exposures were made by plac-

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¹ Hinrichs, M. A., *PROC. SOC. EXP. BIOL. AND MED.*, 1930, **27**, 354.

² Hinrichs, M. A., and Johnson, P. O. C., *PROC. SOC. EXP. BIOL. AND MED.*, 1930, **27**, 971.

³ Carlson, A. J., *Am. J. Physiol.*, **12**, 67.

ing the tip of the quartz rod on various points along the cord. In this way, an increase or decrease in rate of beat was obtained, with the length of the period of exposures and the locus of application of the rod as determining factors. In general, an increase in rate of beat was obtained by short exposures of a given region, and a decrease in rate following longer exposures. The rate of beat could also be slowed by placing the rod on the nerve cord at points of entrance of inhibiting nerves. Rapid recovery of normal rate followed exposures in which the induced variations were not marked.

It was early noted that any pressure on the nerve cord due to too heavy a contact of the rod had to be avoided since it slowed the rate of beat or even blocked conduction.

In many experiments where the normal rate of beat was studied for a considerable period of time, there were distinct indications of a rhythm consisting of a series of slightly faster beats alternating with a series of slower ones. Short exposures did not abolish this rhythm, although it increased the rate of beat throughout.

Cutting transversely through the heart muscle did not eliminate the synchronism of the beat in the two parts of the heart, nor did it affect the conducting power of the nerve cord during exposure.

No change in rate of beat of the entire heart could be demonstrated by direct exposure of the heart muscle itself, nor could the beat be influenced by exposure of the suspensory ligaments. Immediately local contractions of muscular tissue followed exposure of isolated ganglion cells situated in the muscle tissue.

5188

Effect of Estrin Injections on Reproductive Organs, Hypophysis, Kidney, Adrenals, Thyroid and Blood Vascular System.*

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Female sex hormone obtained from human pregnancy urine, prepared and assayed as previously described (D'Amour and Gustavson¹) was daily injected into 4 immature dogs (3 females and 1

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¹ D'Amour, F. E., and Gustavson, R. G., *J. Exp. Pharm. and Therap.*, 1930.