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Blood Chloride Changes in Relation to Diuresis in Dogs.

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There is considerable practical as well as theoretical importance to a complete explanation of the mode of action of the various types of diuretics. In various recent contributions to this field, Curtis has studied the problem in rabbits and upholds the view that the specific diuretics have their primary action on the tissues, mobilizing electrolytes, principally chlorides, which in turn act as stimulants to the kidney and increase the formation of urine. Various workers have pointed out certain apparent differences of behavior between the rabbit's kidney on the one hand and that of dog and man on the other. It seemed advisable, therefore, to determine the effect of certain diuretics on the blood chloride levels in relation to the diuretic response in dogs.

Female dogs were prepared for urine collection by transplanting the trigone of the bladder to the anterior abdominal wall. This procedure obviates the effects of catheterization and enables accurate observations on urine flow to be made. Blood was drawn from either the saphenous or external jugular vein and the chlorides determined by the micro method of Van Slyke. These determinations were checked in many instances by Van Slyke's macro method. Diuresis was produced with euphyllin (theophylline ethylene diamine), salyrgan, and novasurol. No consistent significant variations in the blood chloride level were noted either preceding, during, or following the diuresis. Such negative results might be due to the activity of the kidney so that any tendency to a rise in the blood chloride level might be offset by increased excretion. To test this possibility several dogs were nephrectomized. Twenty-four hours later, these same diuretics were administered and the blood chloride level followed. No significant changes were observed. Another method of testing the ability of these diuretics to mobilize chlorides from the tissues to the blood stream was tried. Distilled water was injected into the peritoneal cavity of dogs. The injected fluid tends quickly to become isotonic and concurrently the level of the blood chloride tends to fall. If chlorides are mobilized from the tissues to the blood stream by the diuretics it would be expected that under their influence there would be a lessened fall in the blood chloride

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.

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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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