

Influence of Inversion of the Dog on the Electrocardiogram.

W. B. KOUNTZ AND M. PRINZMETAL.

From the Department of Medicine, Washington University, and the Barnes Hospital, St. Louis.

From the classical observations of Lewis^{1, 2} in dogs it has usually been inferred that the initial ventricular deflections of extrasystoles arising from the right ventricle are down in lead I and up in lead III, while those arising from the left ventricle are up in lead I and down in lead III. These observations were generally accepted in the interpretation of the human electrocardiogram until it was shown by Barker³ that on stimulation of the human heart extrasystoles were produced which were opposite in character to those obtained in the dog.

We found in dogs with an experimentally produced chronic pericarditis that the initial deflection of ventricular extrasystoles may be reversed from the usual type described by Lewis.^{1, 2} In these experiments it was noted that the heart did not fall away from the anterior chest as is always the case in the normal animal, an observation which suggested that the change might be due to the fact that the heart was held in its normal anterior position when the chest was opened.

To test this hypothesis the following experiment was performed on 6 normal dogs. An animal was anesthetized and securely fastened on its back to a board. The chest and pericardium were opened in the usual manner. Electrocardiographic tracings were made and at the same time 7 points on the ventricle designated by Barker³ were stimulated. The board was then turned over so that the animal was suspended with its anterior surface to the floor. This allowed the heart to fall against the anterior chest wall, was always accompanied by slight rotation of the heart to the right, and represented the more nearly normal position of the heart in the dog. Extrasystoles were again obtained by stimulating the identical 7 points. The animal was then placed on its back and the right bundle was

¹ Lewis, T., *The Mechanism and Graphic Registration of the Heart Beat*, 1925, London.

² Lewis and Rothschild, *Phil. Trans. Royal Soc. (B)*, 1915, **206**, 181.

³ Barker, P. S., McCleod, A. G., and Alexander, J., *Am. Heart J.*, 1929, **5**, 720.

cut. Electrocardiograms were taken in this position and also after inversion of the animal.

When the dog was on its back with the heart against the spine we usually confirmed Lewis^{1, 2} observations. By inverting the dog, which allowed the heart to return to its more nearly normal position, complete reversal of the usual type of extrasystoles and bundle branch block was obtained.

These results suggest that the different findings obtained by Lewis in the dog and by Barker in the human can be explained by the position of the heart in the thorax. Due to the deep anterior posterior diameter of the chest in the dog the heart falls from its normal anterior position when the pericardium is opened, a change which is not mechanically possible in the relatively shallow mediastinum of man.

7244 C

Effects of Ergotamine, Adrenalin, Atropine, and Calcium on Thyroid Gland of the Guinea Pig.*

A. ARNOLD KIPPEN. (Introduced by Leo Loeb.)

From the Department of Pathology, Washington University School of Medicine, St. Louis.

Because of the relations of the autonomic nervous system to the thyroid gland, we thought it of interest to determine the effects of certain drugs which are known or believed to affect the autonomic nerves in a specific manner.

We tested the effect of these drugs in two ways: (1) We either injected solutions of these drugs subcutaneously or intraperitoneally, or administered them orally, and then examined the thyroid gland microscopically, noting the various characteristic features considered in the previous investigations from this laboratory; in particular making approximate counts of mitoses in various glands. (2) We determined the effect of these drugs on the hypertrophy and hyperplasia which is produced in the thyroid by injections of extracts of anterior pituitary gland.

Male guinea pigs, the initial weights of which ranged between 200 and 300 gm., were used for our experiments.

* These investigations were carried out with the aid of a grant for research in science made to Washington University by the Rockefeller Foundation.