Missouri Section

Washington University Medical School, May 15, 1935.

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Influence of Point at which Ventricle Contacts Thoracic Wall on Form of the Electrocardiogram.

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The recent experiments of Katz,[1] Wilson,[2] and of Kountz, Prinzmetal and Smith[3] have indicated that the point at which the heart contacts the thoracic wall may play an important part in determining the character of the electrocardiogram. Especially the work of the latter authors has suggested that the point of the ventricle in contact with the chest wall, as well as the point on the chest wall where this contact is made, may have a profound influence on the resulting curves. It has also served to show that it is extremely difficult in the animal body to change the contact of the heart without changing its electrical axis. Since the influence of these changes has not been studied separately, the following method was devised.

A dog heart-lung preparation (Starling) was set up and removed from the dog's body. The thorax of a second dog, just dispatched, was opened anteriorly and the thoracic viscera left *in situ*. The esophagus of the heart-lung preparation was connected to a point 4 cm. to the left of the sternum on the anterior chest wall. On the heart-lung preparation a wire electrode which could be moved from place to place on either ventricle, was connected by a second wire to the esophagus in the opened thorax. In this way, a cardioelectric impulse arising in the heart-lung preparation was conveyed to the dog's body and recorded on the electrocardiograph by the 3 usual leads attached to the dog's body.

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1 Katz, L. N., and Ackerman, W., *J. Clin. Invest.*, 1932, **11**, 1221.

2 Wilson, F. N., Johnson, F. D., and Barker, P. S., *Am. Heart J.*, 1934, **9**, 472.

3 Kountz, W. B., Prinzmetal, M., and Smith, J., *Am. Heart J.* (To be published.)

It was found that contact could be made with either ventricle of the heart-lung preparation without changing greatly the character of the normal QRS impulse. In the complexes the initial deflection of the galvanometer was always in the same direction. This was followed by a second deflection, which, when the left ventricle of the heart preparation was in contact, was tall (3mm.). When the right ventricle was in contact it was small. The second deflection of the galvanometer was always opposite in direction to the first; the following "T" wave was always in a direction opposite to its preceding second deflection.

With the contact on the same ventricle of the heart-lung preparation, extrasystoles were produced by an interrupted current applied to various parts of that ventricle. Thus, the contact on the same ventricle in different relationship to points of origin of the extrasystoles gave the same type of curve in each instance. Contact of the opposite ventricle, however, yielded curves, the reverse of those obtained before in leads one and three. A definite exception to this was noted when the point of stimulation of the heart was close to the septum in that a complete reversal of the curves did not occur upon changing the contact from one ventricle to another.

It was noted further that the voltage in the resulting curves, both for normal complexes and extrasystoles, was greatest when the apex of the heart was contacted, lowest when the right ventricle was contacted, and intermediate when the left ventricle was contacted.

The right and left bundles of the conducting system were then severed. When the right bundle was cut the electrocardiographic curve characteristic of bundle branch block was best seen when there was direct contact with the right ventricle. The evidence of bundle branch block was seen but poorly in some experiments and not at all in others, when the contact was through the left ventricle of the heart-lung preparation, even though simultaneous records of the right ventricle gave curves showing bundle branch block. When the left bundle was cut, changing the contact from the left to the right ventricle changed the direction of the curve from an upright deflection in lead one and down in lead three to down in all leads. Contact through the right ventricle did not modify the curve of bundle branch block as far as duration of the complex was concerned.

The results of these experiments indicate that change in the point of contact of the heart may greatly modify the electrocardiogram, particularly in the case of bundle branch block and extrasystoles,

even though the axis of the cardioelectrical impulse remains unchanged. Results when both ventricles are in contact serve to emphasize that the character of the electrocardiogram is influenced more by the left than by the right ventricle.

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Effects of Human Anterior Pituitary Gland on Sex Organs and Thyroid of the Guinea Pig.*

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Two types of effects of anterior pituitary gland on the sex organs can be distinguished.[1] The first type is represented by the anterior pituitaries of cattle, hog and sheep. Extracts from these glands cause in the guinea pig a rapid atresia of follicles, a slight production of interstitial gland in the medulla of the ovary and in some atretic follicles a moderate enlargement of the theca interna and sometimes also of the connective tissue which organizes the central cavity of the follicles. Occasionally small or medium sized pseudocorpora lutea may develop. The thyroid gland undergoes a marked hypertrophy. If instead of injection of extract, pieces of anterior pituitary from these species, each one about the size of a pea, are implanted, similar effects are obtained. On the other hand, implantation of pieces from rabbit, rat, and cat anterior pituitary induces in addition to the marked luteinization of the theca interna and the increased production of interstitial gland in the medulla of the ovary an early maturation and luteinization of the follicular granulosa, and the subsequent transformation of this hypertrophic granulosa and theca interna into lutein bodies and pseudocorpora lutea. This occurs if larger follicles are thus affected; somewhat smaller follicles including those which are in process of atresia are changed into interstitial gland bodies in which the theca interna and perhaps also the granulosa undergo luteinization. Daily im-

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

[1] Loeb, Leo, PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 642, 1128; *Endocrinology*, 1932, **16**, 129; Loeb, Leo, and Friedman, Hilda, PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 741.