

sults of intracerebral inoculations are variable in so far as the ultimate distribution of the inoculum is concerned.

TABLE II.  
Comparison of the Diffusion of Material Through the Central Nervous System after Intracerebral Inoculation with Needles of Two Sizes.

Monkey No.	Amount of Mixture Injected, cc.	Size of Needle, inch	Appearance of the Central Nervous System 2 Hours after Injection
1.	1.0	$\frac{1}{2}$	The entire surface of the right frontal lobe up to the fissure centralis was covered with India ink. No ink was observed on the opposite hemisphere nor on the spinal cord. Sections examined at the site of inoculation indicated that the inoculum had been deposited in the brain substance and the site of inoculation just below the cortex was slightly distended. Some of the material had seeped backward and entered the subarachnoid space. No ink was found in the spinal canal.
2.	0.25	$\frac{1}{2}$	The general appearance of the brain and cord of this animal was similar to the one above, except that there was less distension of the brain tissue at the site of inoculation.
3.	1.0	$\frac{3}{4}$	The entire cerebral hemisphere opposite to the side inoculated was completely covered with India ink. Ink was also present in all of the ventricles, at the base of the brain, and on the surface of the spinal cord.
4.	0.25	$\frac{3}{4}$	No ink was observed on the surface of the brain, but it was abundant on the surface of the spinal cord. Sections of the brain revealed a considerable quantity of ink in the lateral ventricle.

9504

**Converse Effects of Stimulating Opposite Ends of a Cardiac Muscle Band.**

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No interpretation of a given phenomenon can be considered final until verified by its application to reproduce that phenomenon. Such a demonstration has hitherto not been available to elucidate the mechanism and pathways of cardiac excitation. The problem may

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be simplified by a technical isolation of the several regions of the heart. Whereas in the standard leads, the excitation process manifests itself *in toto*, it is possible, by the application of direct contacts to the surface of the heart, to recognize the behavior of regions immediately subjacent to these contacts. Using *simultaneous* records by 3 galvanometers of equal resistance and string periodicity, one may compare the response of each locus to stimuli approaching it from one of several directions, to ascertain under what circumstances its intrinsic deflections most accurately recapitulate the normal.

In this instance 2 electrodes were placed on the left border of the heart in line with the fibre direction of the superficial bulbo-spiral muscle. Electrode "A" at the apex was connected with "B" at the base by lead I, and each with the left leg, "L.L.", as leads II and III respectively; all three being recorded simultaneously. The contour of the spontaneous beats of the heart (exposed in a dog after pentobarbital anesthesia) is shown in the cycles marked "N" in Fig. 1. Electrical stimulation of the *apex* at a point very near to contact A initiates a premature systole (cycle "A", Fig. 1) with intrinsic deflections having the same direction as the normal in every lead. A very different result is obtained by retrograde excitation of the muscle from a stimulus introduced at the point B on the base of

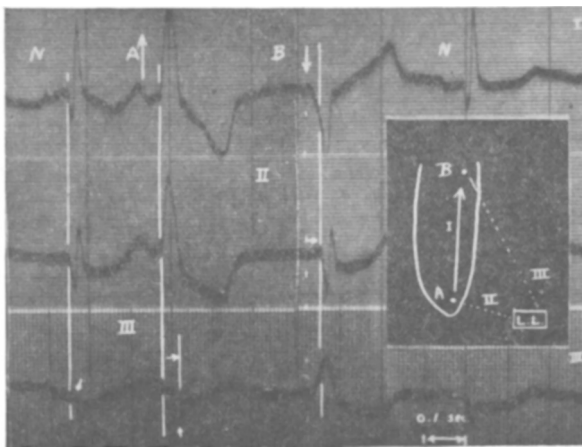


FIG. 1.

Direct lead between contacts on the surface of the heart, from the apex A to the base B, with simultaneous leads *ii* and *iii* from these points to the left leg L.L. Observe that the apical premature systole (A) resembles the normal cycle (N), whereas the basal premature systole (B) in leads *i* and *iii* presents the inverse of normal. (The arrows delimit intervals for the measurement of conduction velocity, discussed elsewhere.)

the heart; both leads I and III from this region are the inverse of normal. (It is to be noted that "extrinsic" waves are lacking in each lead arising from the region of stimulation, *e. g.*, leads A I and II and B I and III. Here is evidence that only adjacent activity is recorded by this method.)

Premature beats have been recorded 41 times in 5 dogs, where direct electrodes were arranged as shown by the inset, Fig. 1. Twenty times the premature beats were excited at or near the posterior horn of the left ventricular apex and in each instance the main deflection was in the same direction as that of the spontaneous beats. Twenty-one times the premature beats were entered at the base of the heart and in each instance the main deflection was opposite in direction to that of the spontaneous beats.

*Interpretation.* The cephalic and caudal ends of the external fibers of the superficial bulbo-spiral muscle were stimulated alternately. Records from direct contacts on these fibers show that apical premature excitation resembles the normal sequence, whereas the product of basal stimulation is the inverse of normal.

This behavior conforms with the anatomical observation<sup>1</sup> that the superficial bulbo-spiral muscle is innervated by the posterior division of the left ramus of the bundle of His, entering that muscle in the posterior papillary muscle of the left ventricle and emerging to the surface in the posterior horn of the apex, to supply that muscle.

## 9505

### Action of Male Sex Hormone With and Without Estrin in the Female Rat.\*

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It has recently been reported that injection of male sex hormone simultaneously with estrin into normal female rats partially suppressed the characteristic histologic reaction of the anterior pituitary to estrin.<sup>1, 2</sup> The degree of weight increase in the pituitary and the

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<sup>1</sup> Robb, Greene, and Robb, *J. Tech. Methods and Bul. Assn. Int. Ass. Med. Mus.*, 1937, **17**, 91-92.

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<sup>1</sup> Wolfe, J. M., and Hamilton, J. B., *Anat. Rec.*, 1937, **67**, 55 (suppl.).

<sup>2</sup> Wolfe, J. M., and Hamilton, J. B., *Endocrinology*, 1937, **21**, 603.