RESPONSES OF THE BLADDER AND SEMINAL VESICLE IN THE RAT.

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ABSTRACT.

The sympathetic is motor to the bladder and seminal vesicle of the rat. It contains very few, if any, inhibitory fibres. The musculature of the bladder and seminal vesicle does not seem to be controlled in any way by the parasympathetic.

Stimulation of the sympathetic (hypogastric) causes in the cat brief excitation of the bladder followed by inhibition[1, 2, 3]. Other animals give varying results[1]. In all cases the sympathetic response can be duplicated by adrenaline [1, 4]. The seminal vesicle of the rabbit and cat is stimulated by adrenaline[5].

Preparation of Rat. The rat is anaesthetized with luminal (150 mg. per Kg. of body weight). The luminal is given intraperitoneally. A small metal cannula is put into the external jugular vein; through this all injections are made. A tracheotomy is then performed. Following this the bladder is exposed by a mid-line incision. The operation for the seminal vesicle is similar.

Bladder. The ureters are ligated low down. A metal cannula is passed into the bladder through the urethra. The cannula has terminal and lateral openings to avoid blocking by contact with the bladder wall. It is secured by a ligature around the neck of the bladder and is connected to a sensitive Marey tambour by rubber tubing. The pressure in the bladder is about 15 cm. of water. The movements of the bladder

1 Elliot, *J. Physiol.*, **35**, 367 (1906-1907).
2 Stewart, *Am. J. Physiol.*, **2**, 182 (1898).
3 Edmunds and Roth, *J. Pharmacol.*, **15**, 189 (1920).
4 Lewandowsky, *Centr. Physiol.*, **14**, 433 (1890).
5 Langley, *J. Physiol.*, **27**, 237 (1901-02).

as a whole are recorded by this method; no attempt was made to determine the action of drugs on the trigonal region.

Seminal Vesicle. We found the following preparation to give the best results. The bladder and urethra are tied off to avoid interference. The vas is tied off above the seminal vesicle. The vesicle is held up and a glass cannula is inserted into its tip. The seminal fluid is washed out with warm saline. The cannula is connected to a tambour in the same way as the bladder. The pressure is about the same as in the case of the bladder.

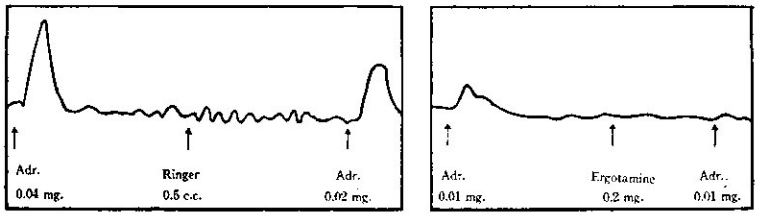

Fig. I and II. Rat. Bladder.

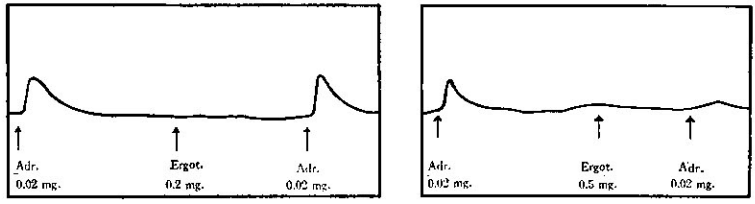

Fig. III and IV. Rat. Seminal Vesicle.

Results.

The results are illustrated in the figures.

Bladder. Adrenaline (0.02—0.04 mg. in 0.5 c.c.) caused a strong single contraction (Fig. I). Repeated doses did not change the response. Large doses of ergotamine (0.2—0.5 mg.) abolish the action of adrenaline. The ergotamine itself had no action; there was no inhibition following the ergotamine on injection of adrenaline. (Fig. II).

The parasympathetic drugs (pilocarpine 0.1 mg., atropine 0.1 mg.) had no effect.

Pituitrin (0.25 unit) caused momentary slight contraction.

Seminal Vesicle. The responses are similar to those of the bladder. Adrenaline caused stimulation (Fig. III); repeated doses did not change the response. Ergotamine abolished the the adrenaline effect (Fig. IV), and there was no inhibition on subsequent injections of adrenaline.

The parasympathetic drugs (pilocarpine and atropine) had no effect.

QUANTITATIVE METHODS IN THE STUDY OF EARLY MAMMALIAN DEVELOPMENT. Donald Mainland, Dept. of Anatomy, Dalhousie Univ., Halifax, N. S. (Read Dec. 14, 1931). Quantitative methods are paramount in many of the biological sciences, and have been extremely produ ctive there. The same class of method has been used in histology and embryology, but has not been so productive. This is largely because insufficient attention has been paid to the natural variation among the objects measured and to the errors due to methods of observation. Statistical tests must therefore be applied, especially those that have been developed for treatment of small samples. Some common criticisms of these tests are discussed. Instances are given of results obtained from quantitative studies of the ova of the ferret immediately after ovulation. These instances include the relationship of the fixative to the size of the chromatin particles in the pronuclei; the demonstration of cytoplasmic polarity; the numbers and positions of the polar bodies; the determination of the volumes and surface-areas of the pronuclei and of the volumes of the ova; the relationships of these measurements to each other and to other factors, such as the fixatives, the stage of development of the ova and their destiny.

THE SOLUBLE PROTEINS OF FISH MUSCLE IN RELATION TO MUSCULAR MOVEMENT AND TO RIGOR MORTIS. S. A. Beatty, Fisheries Exp. Sta. (Atlantic), Halifax, N. S. (Read Feb. 8, 1932). Two proteins, one soluble in distilled water and with a minimum solubility pH 6.0, and the other soluble in salt solution and with a minimum solubility pH 5.0, were isolated from muscle of several species of fish. Evidence was given demonstrating the probability that the albumin is located in the isotropic segments, and the globulin in the anisotropic segments of the muscle. A theory of muscular movement and of rigor mortis was advanced based on a flow of water from the isotropic to the anisotropic segments as the result of known ionic changes in the muscle. This flow is possible because of differences in the physical and chemical properties of the proteins concerned.