strated in 5 animals prepared by intraperitoneal injection of rabbit sera high in precipitin and complement fixing antibody titer. Tests were done one to 4 days after injection of the sera.

Summary. A solution of undenatured *H. pertussis* protein was found to be oxytocic in the Dale bath in high dilution. The normal guinea pig uterus reacted with a histamine-like contraction to repeated additions of *H. pertussis* protein—1 part in 100,000.

Active sensitization of the guinea pig uterus to undenatured *H. pertussis* protein was produced by repeated intraperitoneal injections of living Phase 1 *H. pertussis.* In one instance the classical Schultz-Dale reaction was obtained with 1 part of *H. pertussis* protein in 7,200,000. The uterine strips of 3 other animals prepared by injection of living *H. pertussis* contracted and were desensitized in dilution only slightly higher than oxytocic.

Active sensitization of the guinea pig uterus was also produced in one instance by a single subcutaneous injection of undenatured *H. pertussis* protein. The strip contracted and was desensitized by 1 part of *H. pertussis* protein in 720,000. Passive sensitization with *H. pertussis* immune sera of high titer was unsuccessful.

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Effect of Oestrin and Gonadotropic Hormone Injections upon Hypophysis of the Adult Rat.

WARREN O. NELSON. (Introduced by M. M. Ellis.)

From the Department of Anatomy, University of Missouri.

Moore and Price[1] studied the effect of gonad hormones upon the anterior pituitary lobe cells. The writer examined the similarity between the hypophyses of normal adult rats injected with oestrin and those injected with gonad-stimulating preparations. The material includes the hypophyses from 23 males, 21 females, 32 castrated males, and 23 spayed females which had been injected daily with from 15 to 50 R. U. of oestrin, as Theelin in oil,* for 28 to 48 days; 22 males and 29 females injected daily with 50 to 150 R. U. of Antuitrin-S for 14 to 35 days; 11 males and 23 females injected daily with 15 R. U. of a sheep pituitary extract for 12 to 25 days;

[1] Moore, C. R., and Price, D., *Am. J. Anat.*, 1932, **50**, 13.

* All of the hormone preparations used in this study were kindly supplied by Drs. O. Kamm and D. A. McGinty, Parke, Davis and Company.

and 5 males and 7 females injected daily with 30 to 40 R. U. of an extract of pregnant mare serum. In addition, the hypophyses from 13 castrated males, 11 spayed females, and 14 cryptorchid males which had received daily 50 to 100 R. U. of Antuitrin-S for 10 to 30 days have been studied.[2]

At the termination of an experiment the hypophyses were removed with the gonads and sex-accessories, weighed and fixed for study. For the hypophyses, Zenker-formol, Zenker-formol-acetic, Regaud's or Champy's fluids have been used. A modified Mallory, iron-hemotoxylin, Altmann's or Severinghaus' technique have been employed in staining these pituitaries.

There are certain differences in the hypophyseal picture, depending upon the amount and duration of treatment. The principal and characteristic findings are as follows: With the exception of castrates receiving Antuitrin-S, whose pituitaries were in no way altered,[2] the typical pictures in the hypophyses of all the above animals were very similar. The most striking effect has been a pronounced decrease in the number of normal basophiles. In the castrates (oestrin treated) and cryptorchids there has been an almost complete disappearance of the so-called "castration cells". In the Zenker and Regaud preparations there is a great increase in the number of cells which appear to be chromophobes.[3] However, in the Golgi preparations many of these apparent chromophobes are seen to be degranulated basophiles with enlarged Golgi rings and numerous mitochondria. The acidophiles are more erratic in their behavior, but in general they, too, show a decrease in normal cells with the appearance of degranulated forms. Similar findings have been recorded by Severinghaus,[4] using Follutein.†

A quantitative difference occurred in the male and female pituitaries. A considerably greater amount of hormone is required to obtain a comparable picture in the male gland. This is in keeping with the observation[5] that the male hypophysis is much less easily influenced by gonad hormone than the female gland. As a rule the female gland increases in weight, an observation less constant in the male.

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[2] Nelson, W. O., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 1192.

[3] Nelson, W. O., *Anat. Rec.*, 1933, **55**, 70.

[4] Severinghaus, A. E., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 593.

† Since this paper was originally submitted an additional paper by Severinghaus[6] has appeared.

[5] Nelson, W. O., *Anat. Rec.*, 1933, **55**, 31.

[6] Severinghaus, A. E., *Anat. Rec.*, 1934, **60**, 43.

The similarity in effects produced by oestrin and by gonadotropic preparations in both sexes suggests the possibility that the active factor in animals receiving gonadotropic material has been oestrin produced by the animals' own gonads. This is almost certainly true in the female and is not unlikely in the male.

Some of the degranulated basophiles seen in the Golgi preparations have much the same appearance as the so-called "pregnancy cells". These pregnancy cells have been considered generally to be chromophobes or acidophiles modified through the activity of the corpus luteum of pregnancy. From present findings it seems possible that the pregnancy cells are responsible for the maintenance of the corpus luteum of pregnancy rather than genetically through the action of the corpus luteum hormone.

Our findings are open to different interpretations. It may be considered that the increased gland weight and the large number of degranulated basophiles indicate an increased secretory activity on the part of the basophiles. The enlarged Golgi, numerous mitochondria, and prominent nucleoli all might be taken as evidence of such a functional state. However, we cannot always ascribe physiological activity purely on the basis of a morphological picture and in the present instance the physiological findings are not indicative of basophilic activity. Judged solely on the basis of the pituitary findings in the animals injected with gonadotropic hormone it is difficult to determine the functional condition of the pituitary since the sexual organs, whose condition are an index of the gonadotropic activity of the pituitary, are directly stimulated by the injected hormone. When the gonads and sex accessories (male) of animals injected with oestrin are considered, a different condition is observed. Although the hypophyses present the same morphological picture as in animals receiving gonadotropic hormone, the gonads, and through them, the accessories are very apparently damaged. This is believed to be due to the direct action of oestrin on the hypophysis.[1] Implantation studies and blood and urine examinations offer additional evidence that secretory activity of the hypophysis is inhibited by oestrin. The morphological picture in the hypophysis, which in some instances is distinctly abnormal, indicates that there has been a severe derangement of normal cell activity occasioned by an upset of the normal hormonal balance between gonads and hypophysis. A more exact statement concerning the nature of these altered relations and their resultant effect on pituitary activity must await further experimentation.