treated animals may be readily differentiated from the controls even by examination with low power of the microscope.

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Ant. Pituitary Changes in the Adult Male Rat Following Thyroidectomy.*

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The authors, in the preceding paper, have reported changes in the anterior pituitary of the adult male rat following administration of thyroid. The present paper deals with the changes which occur after thyroidectomy.

The literature is replete with descriptions of pituitary changes following thyroidectomy. Numerous workers have reported that hypertrophy of the pituitary follows ablation of the thyroid. Simpson and Hunter[1] and Marine[2] review these findings, and Hammett[3] has confirmed them. The effect of thyroidectomy upon the gonad-stimulating potency of the pituitary has also received attention. Smith and Engle[4] and Van Horn[5] found no change in this potency although Evans and Simpson[6] reported a decrease. Histological studies of the pituitary after thyroidectomy have also been numerous. Trautmann,[7] in his admirable treatise on pituitary changes in the goat, fully reviews previous literature. Bryant[8] described in the rabbit a decrease in eosinophiles and a degenerated vacuolated hypertrophy of the chromophobes indicating a state of decreased secretion, while Kojima[9] reported that thyroidectomy, like castration, results in an increase in basophiles in the anterior pituitary of the rat, some of which are colloid filled.

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The pituitaries of 9 thyroidectomized adult male rats of the Long-Evans strain were reserved for cytological study. The pituitaries were fixed, sectioned serially at 3/u, and stained as described in the preceding paper. The larynx region was removed at autopsy and carefully examined with a dissecting scope for thyroid tissue, and, although in no instance was any found, the material was preserved for serial sectioning.

Some of these rats had been unilaterally castrated prior to thyroidectomy in which case a unilateral castrate acted as control. The pituitaries of such controls are in every respect similar to those of normal unoperated controls.

Marked changes occur in the anterior lobe of the pituitary. The basophiles are increased in number, are of maximum size and give to the pituitary the castrate appearance. Many have deeply chromatic elongated nuclei. Large numbers of typical castration cells are present. This finding is unexpected after thyroidectomy, since castration cells had previously been found in the pituitaries of rats made hyperthyroid by thyroid injection or feeding. It is furthermore difficult to explain, in view of the fact that the accessory reproductive organs may be normal in weight while at the same time the pituitary shows the basophilic increase and many castration cells. The average weight of the accessories of 8 thyroidectomized rats was 2.695 gm., while that of their controls was 3.328 gm. In half of the cases, however, the accessories of the treated animals weighed more than those of their normal controls.

Although the basophiles of the thyroidectomized rats are similar to those of castrate and thyroid treated rats, the acidophiles are markedly different. Microscopic examination of serial sections reveals at once a loss of acidophilia. Closer inspection shows this to be due to degranulation of the acidophiles and to the small size of many of the cells. Certain acidophiles are greatly enlarged but show a vacuolation which closely approximates the degenerating vacuolation of the acidophiles described by Trautmann[7] in the thyroidectomized goat. Acidophilic granules in these cells are scarce, the typical Golgi apparatus is frequently fragmented, while mitochondria are numerous and often filamentous. Unusual nuclear phenomena are found, among which are nuclear inclusions similar also to those described by Trautmann, except that they take a basic stain. Large areas of chromophilic cells with Golgi of the acidophilic type are especially prominent in the anterior and posterior margins of the anterior lobe.

The advancement of any of several suggested explanations for

these unusual pituitary findings is withheld pending completion of further experimental data.

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Effect of Injections of Pituitary Whole Gland Extract on Immature Alligator.

T. R. FORBES. (Introduced by R. K. Burns, Jr.)

The efficacy of the anterior hypophysis in producing precocious development of the reproductive system in lower vertebrates has been shown by the recent studies of Burns and Buyse,[1, 2, 3] and Burns,[4] who used as subjects larvae and recently metamorphosed salamanders. Reptiles have rarely figured in pituitary investigations. Herlant[5] found that injections of anterior lobe extract caused a general hypertrophy of the reproductive system of *Lacerta,* Noble and Bradley[6] state that hypophysectomy delays moulting in *Hemidactylus,* Schaefer[7] reports testicular atresia in *Thamnophilis* following hypophysectomy, with a partial restoration of the testes to the normal condition following several hypophyseal implants, and Houssay[8] produced ovulation in a single female snake, *Xenodon,* after similar implantations. All of these experiments were carried out with mature animals.

In the present work, the immature alligator, *Alligator mississippiensis,* was chosen for study. The average total length of the first group of animals used was 24 cm., and their approximate age at the beginning of the experiment was 4 months. Intraperitoneal injections into 10 animals of 0.5 cc. per animal of the Parke, Davis & Co. sheep whole gland alkaline aqueous extract were made 3 times a week, a similar group of 10 animals serving as controls. Gross examination after 6 weeks of injections, showed a great hypertrophy of the testes of the single male member of the experimental group. A slightly less, but still striking, hypertrophy of the gonads

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