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Changes in Hypophysis of Adult Male and Female Rats After Pregnancy Urine Extract Injections.*

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Meyer, Leonard, Hisaw and Martin[1] demonstrated that oestrin diminishes the gonad stimulating capacity of the anterior pituitary. Inasmuch as the injection of P. U. extract into normal females increases their oestrin output, the potency of their pituitaries should thereby be diminished. Leonard[2] injected a large series of adult male and female rats with P. U. extracts† and subsequently tested their pituitaries for gonad stimulating potency by implantation into immature female mice. Pituitaries of the injected animals showed a marked decrease in gonad stimulating potency. The potency of the castrate's pituitary was not diminished by P. U. injections.

The pituitaries of 32 normal and castrate controls and injected rats, from the experiments of Dr. Leonard, were utilized for cytological study. They were fixed and stained by methods previously described.[3] As expected, marked changes were observed in the basophiles.[4] These cells in large part were depleted of their basophilic granules. Their cytoplasm appeared as clumped, yellowish masses frequently with small basophilic granular areas interspersed. The distinguishing Golgi apparatus was hypertrophied. The cytological picture suggests a cell which has been in active secretory phase. These basophiles range in size from normal basophiles down to cells little larger than chromophobes. An even more striking feature, however, is their obvious numerical increase. There is a corresponding decrease in chromophobes. If changes occur in the acidophiles, they are of such character that they could be detected only by careful statistical analyses of cell size and numbers. Technical meth-

* Aided by a grant from the Committee for Research in Problems of Sex, the National Research Council, administered by Dr. P. E. Smith.

[1] Meyer, R. K., Leonard, S. L., Hisaw, R. L., and Martin, S. J., PROC. SOC. EXP. BIOL. AND MED., 1930, **27**, 702; *Endocrinology*, 1932, **16**, 655.

[2] Leonard, S. L., *Anat. Rec.*, 1933, **57**, 45.

† Follutein kindly furnished by Dr. J. A. Morrell, E. R. Squibb and Sons.

[3] Severinghaus, A. E., *Anat. Rec.*, 1932, **53**, 1.

[4] Compare findings of Wolf, J. M., *et al.*, on Reaction of Anterior Hypophysis of Immature Female Rats to Placental Hormone. PROC. SOC. EXP. BIOL. AND MED.. 1933, **30**, 1092.

ods which do not demonstrate the Golgi region either in positive or negative form would make difficult an accurate separation of the chromophobes from the smaller of the atypical degranulated basophiles. The injections of P. U. extract, therefore, seem to cause both an increase of basophiles and a rapid atypical degranulation of their cytoplasm. The pituitaries of castrates injected with P. U. extract cannot be distinguished histologically from the castrate controls.

It was suspected during the course of the study that both the pars anterior and the pars intermedia were enlarged. Pituitary reconstructions were made on 7 adult male rats from 2 series of experiments of Dr. P. E. Smith, in which 25 R.U. of Antuitrin S daily for 75 days, and 100 R.U. daily for 71 days respectively were injected. The pituitaries from these animals were cut serially at 7μ and the pars anterior and pars intermedia were measured with a polar planimeter, every third section being measured. The results are shown in Table I. Both the pars anterior and pars intermedia

TABLE I.
Results of Antuitrin S† Injections into Adult Male Rats.

Rat		Treatment		Weights in gm.		Relative Polar Planimeter Values		
No.	Wts. gm.	R.U.	Days	Accessories	Testes	Pars Anterior	Pars Intermedia	Total P.A. + P.I.
9505	310	Control		2.4	2.17	12306	1662	13968
9507	280	"		2.07	1.95	11764	(1964)*	13728
9431	290	"		2.3	1.9	12740	1656	14396
9433	286	25 (¼ cc.)	75	4.05	2.5	14207	1876	16083
9434	290	25 (¼ cc.)	75	5.2	2.34	14248	1990	16238
9435	280	25 (¼ cc.)	75	5.4	3.05	14250	1946	16196
9504	330	100 (1 cc.)	71	4.5	3.2	13912	2241	16153
9436	280	25 (¼ cc.)	75	5.4	2.8	Reserved for cytological study		

* A massive colloid cyst in the pars intermedia and extensive cellular anastomoses with the pars anterior may be factors in this abnormally large size.
† Kindly furnished by Dr. Oliver Kamm, Parke, Davis & Co.

are definitely enlarged. Although the pars anterior of the heaviest injected animal (9504) is slightly smaller than those of the other injected forms,[5] the pars intermedia is noticeably the largest of the group. No mitoses are found and in a preliminary study, a unit area of pars intermedia from an injected animal was found to contain only two-thirds as many nuclei as are to be found in the gland of a normal control. This indicates that the pars intermedia enlargement is due to a hypertrophy and not a hyperplasia of the cells. The involvement of pars intermedia in pituitary-gonad endocrine relations is unusual, and these findings are being subjected to much more detailed analysis.

[5] See Collip, J. B., *et al.*, PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 590.