

Hastening Development of Female Genital System by Daily Homoplastic Pituitary Transplants.

PHILIP E. SMITH.

*From the Department of Anatomy, Stanford University,
Stanford University, Calif.*

The success of the writer^{1, 2} in restoring the atrophied sex apparatus of the hypophysectomized rat by daily homoplastic pituitary transplants, made it seem not unlikely that the transplants might hasten the development of the sex apparatus of the immature unoperated animal. A series of experiments was therefore undertaken in which homoplastic pituitary transplants, taken from full-grown rats of both sexes, were made daily in females which would not normally mature for some time.

It was found that this treatment rapidly induced the changes characteristic of sexual maturity, (opening of the vagina, uterine hyperemia and distension, follicle and corpora formation). These changes were secured as early as the weaning date (22nd day of life), the animals weighing approximately 40 grams. The vaginal smear was oestral in type. Structurally the changes indicative of sexual maturity were present in all parts of the genital system.

When the transplants were commenced at about the weaning date, sexual maturity was induced in 5 or 6 days. If the transplants were begun in animals considerably younger, a longer treatment was required. This was shown by one series (3 treated and 3 controls), in which treatment was instituted on the 14th day of life. One of the treated animals matured sexually in 8 days, two in 10 days. In no case have these transplants failed to bring about sexual maturity at a considerably earlier period than it would normally have occurred. The results obtained transcend all normal variability.

Experiments show that the anterior pituitary component of the transplant is responsible for the induction of the premature sexual maturity.

Kymographic records of the spontaneous contractions of the isolated uterus in Ringer's solution show that the amplitude of these uterine contractions in the treated animals greatly exceeds those of the controls; they, in fact, are equal or nearly equal to those of an animal which matures at the usual age.

In the absence of the ovaries no precocity in the development of the uterus or vagina is brought about by the pituitary transplants,

nor is the atrophy of these organs which follows ovariectomy prevented by the transplants. The precocious maturing of the uterus and vagina in the treated unoperated animal is effected by the ovarian (follicular) growth induced by the pituitary transplants.

The precocious maturing of the genital system, which is invariably induced by daily homoplastic pituitary transplants, stands in marked contrast to the failure to hasten sexual development by other methods of pituitary administration. Single transplants of one or several glands have been unsuccessful (Shafer,³ Clairmont and Ehrlich,⁴ Exner.⁵) The intraperitoneal injection of a suspension of the anterior hypophysis of ox, postpones sexual maturity (Evans and Long⁶). A number of investigators have shown that pituitary feeding does not hasten the development of this system.

I have also found that daily pituitary transplants in the adult female usually leads to an increase in the size of some of the follicles of the ovaries. They frequently become cystic. These ovaries may exceed the weight of like glands in the control by from two to four times. The cysts may attain a very considerable size (2 mm.). A thin layer of granulosa cells is present in some of the cysts, in others there is only a thin layer of lutein cells or at places only connective tissue.

¹ Smith, P. E., *Anat. Rec.*, 1926, xxii, 221.

² Smith, P. E., *J. Am. Med. Assn.*, 1926, (in press).

³ Schafer, E. A., *Berliner Universitätscher.* Teil 3, 1911.

⁴ Clairmont and Ehrlich, *Arch. f. klin. Chirurg.*, 1909, lxxxix, 596.

⁵ Exner, A., *Deutsch. Z. Chir.*, 1910, cvii, 172.

⁶ Evans and Long, *Anat. Rec.*, 1921, xxi, 62.

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The Effect of Liver Extract on Ducks.

THEO. C. BURNETT.

*From the Spreckels Physiological Laboratory, University of California,
Berkeley, Calif.*

In previous communications¹ it was pointed out that liver extract contained both histamine and cholin, and that the depressor effect was possibly due to these substances. As a further link in the evidence leading to these conclusions the effect of liver extract has been tried on ducks. Hogben² has stated that a 1 per cent extract