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Experimental Study of Ovariectomy and Transplantation in the Pregnant Albino Rat.*

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The work of Herrick[1] concerning ovariectomy and transplantation in relation to the maintenance of pregnancy in the guinea-pig seems to offer evidence contradictory to that reported by previous workers, among others, Fraenkel,[2] Marshall and Jolly,[3] Dripps,[4] Harris.[5] Their results indicated the necessity of the *corpus luteum* at least during the first half of pregnancy. Herrick, employing virgin ovaries for his grafts, and therefore no *corpora lutea* of pregnancy, concludes that the substance in the ovary responsible for the maintenance of gestation is not confined to the *corpus luteum*.

In view of the apparently contradictory results obtained by Herrick it was thought well to make a more thorough study of this phase of the factors involved in the maintenance of pregnancy and if possible to throw some light upon the true rôle played by the *corpus luteum*. The animal selected for this work was the albino rat, 19 experimental cases serving as the basis for this report.

The exact time of copulation was observed in each instance and the dates of the various stages of pregnancy were calculated therefrom.

The ovaries used as grafts were taken from virgin or from immature females in all except 2 cases, pregnant ovaries being there employed. The implants were made between the abdominal rectus muscles in a small pocket. Transplantations were made at different stages of pregnancy (9th, 12th, and 13th days) and extirpation of the host's ovaries was performed in all cases on the 13th or 14th day. A small proportion of the grafts failed to take (3 out of 20), in which event resorption or absorption ensued. This failure was demonstrated by a careful autopsy revealing complete fibrous infil-

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[1] Herrick, E. H., *Anat. Rec.*, 1928, xxxix, 1.

[2] Fraenkel, L., *Arch. f. Gynaek.*, 1903, lxviii, 438.

[3] Marshall, F. H. A., and Jolly, W. A., *Proc. Roy. Soc. London*, 1905, lxxvi, 395.

[4] Dripps, D., *Am. J. Anat.*, 1919, xxv, 117.

[5] Harris, R. G., *Anat. Rec.*, 1927, xxxvii, 83.

tration on the site of the graft. In cases of successful takes, where but a day was allowed for establishment of the graft before removal of the host's own ovaries, pregnancy continued to term. Either the foetuses were still-born or died shortly after delivery. If 4 or 5 days' time was allowed between implantation and ovariectomy normal young were born.

A histological study of transplanted ovarian tissue recovered a day before or immediately following parturition gave evidence of typical lutein tissue. Control ovaries (*i. e.*, the corresponding ovary to the one implanted) showed only immature follicles, no lutein tissue being present.

Five bilaterally ovariectomized females aborted within 2 days following operation. The second ovary was removed on the 14th day of gestation in these controls.

The above data seem to indicate that the *corpus luteum* is essential for the maintenance of pregnancy in the albino rat and that when sufficient time is allowed for vascularization of grafts, immature ovaries transplanted into a pregnant female undergo an adaptation, develop masses of luteal tissue (clearly demonstrable in histological section), and suffice as functional substitutes for the original ovaries in pregnancy.

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Differential Reaction of Ovariectomized Pregnant Rats to Ovarian Grafts in Various Stages of the Oestrous Cycle.*

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In connection with a study of transplantation of ovaries removed from virgin rats, into ovariectomized pregnant females it was discovered that a differential effect resulted from the employment of ovaries whose donors were in various stages of the oestrous cycle. Fourteen experimental animals furnish the basis for the following report.

All transplants were made on the 12th or 13th day of gestation, with ovariectomy following within 24 hours. Transplants were placed in specially prepared pockets between the abdominal rectus

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