and 80 on a maternal diet deficient in vitamin B.[2] The fixatives used were Bouins and formalin. A number of tissues were stained with Delafield's hematoxylin and eosin while others were stained with iron alum hematoxylin and eosin. Frozen sections were also made of a representative number of the livers and stained with Sudan III.

Compared with the controls, the majority of the nursing young whose mothers received a diet deficient in the vitamin B complex showed fatty metamorphosis of the liver, as indicated by marked vacuolation. The fact that there was an actual increase in the weights of the livers of such pathological nurslings as well as considerable increase in the weight of liver in proportion to the body weight of such nursing young, suggests that the pathological condition encountered is fatty infiltration rather than fatty degeneration. On the other hand, the nursing young suffering from uncomplicated vitamin B deficiency showed no demonstrable fatty metamorphosis in the liver.

5012

Experimental Production of Deciduomata in the Rat by an Extract of the Corpus Luteum.

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That Loeb's hypothesis concerning the production of deciduomata in experimental animals is correct has become increasingly apparent. He concluded following his work upon guinea pigs[1] that this reaction depends upon the continued presence of the hormone of the corpus luteum. Frank[2] showed that this phenomenon can be induced in lactating rats by the stimulation of the uterine endometrium at the proper time following parturition. Long and Evans[3] confirmed and extended his findings. In their work pseudo-pregnant as well as lactating animals were employed. They also introduced a convenient and non-traumatic method of uterine stimulation, *viz.*, the insertion of silk threads through the lumen of the

[2] Sure, B., and Smith, M. E., *J. Nutr.*, 1929, i, 537.

[1] Loeb, L., *J. Am. Med. Assn.*, 1909, liii, 1471.

[2] Frank, R. T., *Surg. Gyn. and Obst.*, 1911, xiii, 36.

[3] Long, J. A., and Evans, H. E., *Memoirs of Univ. of Calif.*, 1922, vi, 84.

uterus. Evans and Simpson[4] were able to demonstrate the efficacy of both the growth and the maturity hormones of the anterior pituitary in evoking a uterine response. The result depended upon the induction of a pseudo-pregnant condition in the host's ovaries. Parkes[5] employing an alkaline extract of the anterior pituitary showed that the phenomenon could be induced in the mouse.

Following this evidence for the rôle played by the corpus luteum in placentoma formation it was but a step to the employment of active extracts of corpora lutea in creating a condition in the uterus whereby the reaction could be called forth. Weichert,[6] using Hisaw's preparation was able to produce deciduomata in spayed and normal animals and Goldstein and Tatelbaum,[7] employing the extract prepared by Allen and Corner, were able to confirm Weichert's results on spayed guinea pigs.

It was considered of value to demonstrate the reaction in the rat when evoked by suitable treatment with an active extract of the corpus luteum. We were also interested in determining the activity of the preparation employed by us in sensitizing the uterus. Previously this extract has been shown to be active in maintaining pregnancy in the absence of the ovaries (Harris and Pfiffner[8]) and in developing the mammary glands (Nelson and Pfiffner, unpublished data). Full details concerning the nature of this extract will be published in a later paper. A related preparation has been employed in the inhibition of oestrus (Haterius and Pfiffner[9]) and in the prolongation of normal pregnancy (Nelson, Pfiffner and Haterius[10]). The latter extract has been described in previous publications.

Both normal and spayed animals were employed (12 in all). In the series of normal females (4) injection of the extract was begun during oestrus. In the spayed series the animals (4) were oöphorectomized during oestrus and injection commenced the same day. The extract was introduced subcutaneously and varied in quantity from 0.2 to 0.25 cc. (1.0 cc. equivalent to 40 gm. fresh corpora lutea) daily throughout the experiment. From 3 to 5 days follow-

[4] Evans, H. E., and Simpson, M. E., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 597.

[5] Parkes, A. S., *Proc. Roy. Soc., B.*, 1929, civ, 183.

[6] Weichert, C. K., PROC. SOC. EXP. BIOL. AND MED., 1928, xxv, 490.

[7] Goldstein, L. A., and Tatelbaum, A. J., *Am. J. Physiol.*, 1929, xci, 14.

[8] Harris, R. G., and Pfiffner, J. J., *Anat. Rec.*, 1929, xliv.

[9] Haterius, H. O., and Pfiffner, J. J., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 818.

[10] Nelson, W. O., Pfiffner, J. J., and Haterius, H. O., *Am. J. Physiol.*, 1930, xci, 690.

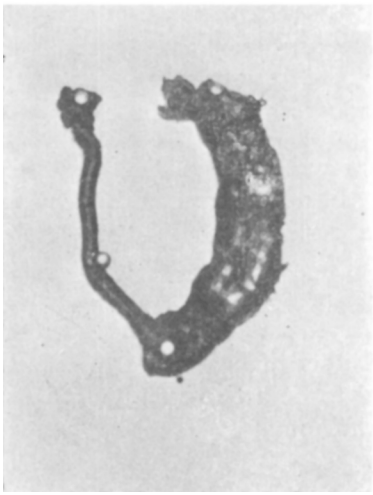

FIG. 1.
Stimulated and control horns of a treated animal. The remnants of two of the threads may be seen.

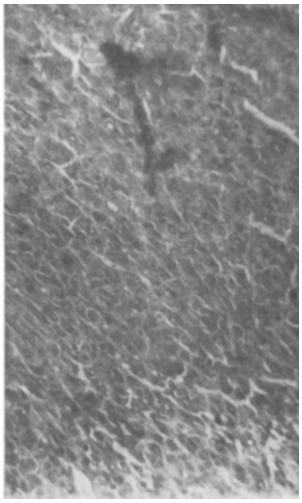

FIG. 2.
Microphotograph of a cross section through a deciduoma. X 90.

ing the initial injection the animals were operated and 3 or 4 silk threads introduced into one horn of the uterus. They were sacrificed from 3 to 7 days later and the uteri recovered for histological study.

In every instance deciduomata were present, the largest (8-10 mm.) being found in the animals in which stimulation occurred on the third day of the experiment and the sacrifice 7 days later. Fig. 1 shows the marked response called forth by stimulation of the endometrium under these conditions. The control horn had been subjected to exactly the same influences except the slight stimulus afforded by the threads. Fig. 2 shows the decidual cells in a cross section through a deciduoma.

The conditions essential for placentoma formation are (1) the uterus must be prepared for the luteal stimulus by the action of the follicular hormone upon the endometrium—a priming action, (2) the uterus must be sensitized by the lutein hormone for several days prior to stimulation and must be under its influence throughout the life of the deciduoma. The incidence of oestrus results in the disappearance of the tumor. As may be noted the animals employed in this work complied with these qualifications, oestrus occurring in each case on the day of initial injection and not again appearing throughout the course of the experiment. The importance of the preparatory action of oestrus was apparent from the failure of one

animal to respond. She was treated in every way as the other injected animals, except that she had been spayed 6 weeks previously and hence her uterus had not been primed by the follicular hormone.

As a control on any possible traumatic effect of the stimulus, a series of untreated rats were operated and threads drawn through the uteri at the appropriate time. They were examined at the onset of the next oestrus a few days later. In no case was any effect of the stimulus found, either upon the oestrous cycle or upon the uterus.

It is to be concluded that under the proper conditions placentomata may be induced in normal and spayed rats by treatment with a lipoid extract of the corpus luteum. Either this extract or a related one has previously been demonstrated to be active in fulfilling the other known functions of the corpus luteum.

5013

Calcification of Arteries in Rats fed Viosterol.

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Indications that irradiated ergosterol administered perorally causes deposition of calcium in the arterial walls have appeared in the literature. Hückel and Wenzel[1] obtained thickening of the anterior portion and roughening of the inner surface of the aorta in rabbits. Hermann[2] found weight loss and evidence of calcification in the kidneys in rats. Hess[3] found hypercalcemia in infants.

Experimental production of calcification of arteries in laboratory animals such as the rat, which does not normally show this condition, would afford material for study of possible influences which hasten, retard, or remove the deposition.

Methods and Results. Four adult male albino rats were placed in separate cages, and fed a balanced basal ration. To each of 3 of

[1] Hückel and Wenzel, *J. Am. Med. Assn.*, 1929, xciii, 1427.

[2] Hermann, Siegwart, *Klin. Wochensch.*, 1929, viii, 1752.

[3] Hess, A. F., Lewis, J. M., and Rivkin, H., *J. Am. Med. Assn.*, 1928, xci, 783.