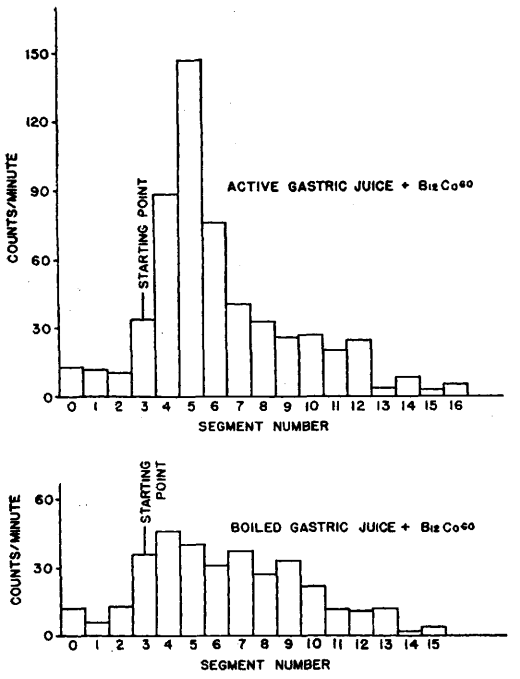

FIG. 3. Comparison of localization of radioactivity after simultaneous paper electrophoresis of boiled and unboiled aliquots of a mixture of gastric juice and B_{12} Co^{60}.

serum. 2. This localization of vit. B_{12} to a specific portion of gastric juice by paper electrophoresis may be a clue to the further identification of the intrinsic factor of Castle.

1. Berk, L., Castle, W. B., Welch, A. D., Heinle, R. W., Anker, R., and Epstein, M., *New Eng. J. Med.*, 1948, v239, 911.

2. Schilling, R. F., Harris, J. W., and Castle, W. B., *Blood*, 1951, v6, 228.

3. Wallerstein, R. O., Harris, J. W., Schilling, R. F., Castle, W. B., *J. Lab. and Clin. Med.*, 1953, v41, 363.

4. Ternberg, J. L., and Eakin, R. E., *J. Am. Chem. Soc.*, 1949, v71, 3858.

5. Beerstecher, E., and Altgelt, S., *J. Biol. Chem.*, 1951, v189, 31.

6. Bird, O. D., and Hoevet, B., *J. Biol. Chem.*, 1951, v190, 181.

7. Chaiet, L., Rosenblum, C., Woodbury, D., *Science*, 1950, v111, 601.

8. Deiss, W. P., Albright, E. C., and Larson, F. C., *J. Clin. Invest.*, 1952, v31, 1000.

9. Latner, A. L., Ungley, C. C., Cox, E. V., McEvoy-Bewe, E., and Raine, L., *Br. Med. J.*, 1953, v1, 4808.

Received June 4, 1953. P.S.E.B.M., 1953, v83.

Growth of Deciduomata in Adrenalectomized Rats. (20399)

JOSEPH T. VELARDO, FREDERICK L. HISAW,* AND ALDEN B. DAWSON.†

From the Biological Laboratories, Harvard University, Cambridge, Mass.

Recent reports by Pomeau-Delille(1), Swingle *et al.*(2), and Hisaw *et al.*(3) have clearly shown that decidual development can proceed in bilaterally adrenalectomized rats. The paper by Hisaw *et al.*(3) further indicated that the antimesometrial and mesometrial decidual tissue were histologically comparable in intact and adrenalectomized rats, and that the metrial glands were indistinguishable in the two groups as well. The present study is chiefly concerned with a series of experiments devised to ascertain the difference in the weights of uteri containing decidual tissue from the fifth full day after uterine traumatization to the twenty-first day of prolonged pseudopregnancy.

Procedures. Estrous rats were bilaterally adrenalectomized 12 hours after cervical stimulation(4) and were then divided into 2 groups. One was given 1% NaCl drinking solution and the other tap water. Vaginal smears were taken daily, fixed in methyl alcohol, and were then stained in Giemsa stain. Five full days after electrical stimulation of the uterine cervices, both uterine horns were traumatized throughout their entire length by scratching the antimesometrial surface with a burred needle. Laparotomies were performed 72 hours after uterine traumatization to es-

* This investigation was supported in part by a research grant from the National Institutes of Health, Public Health Service.

† Aided by a grant from the William F. Milton Fund, Harvard University.

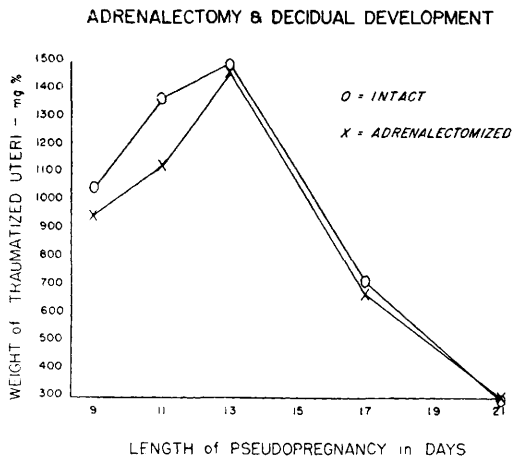

FIG. 1. A graph showing the similarity in the weights of uteri containing decidual tissue in intact and adrenalectomized rats.

tablish the presence of deciduomata. Groups containing 7 to 10 animals were killed on the 9th, 11th, 13th, 17th, and 21st days of pseudopregnancy (*i.e.*, 5, 7, 8, 13 and 17 full days after the uteri were traumatized). The uteri were removed and weighed to the nearest tenth of a milligram on a Roller-Smith torsion balance. The same procedures were used in the non-adrenalectomized control series.

Results and discussion. Developing deciduomata were found in both the adrenalectomized (with and without 1% NaCl drinking solution) and intact control rats when laparotomized 72 hours after uterine traumatization. Forty-eight hours later, on the 9th day of pseudopregnancy, the first 2 groups of rats were killed, and the uteri were removed and weighed. Examination of the arithmetical means plotted in Fig. 1 clearly shows that there is only a slight difference in the weight of the uteri in both groups at this time. There is a somewhat larger difference in the weight responses on the 11th day of pseudopregnancy, but the gross morphology of the deciduomata in both groups was essentially the same. That adrenalectomy exerts no appreciable effect on the growth of the decidual reaction is further borne out in the data obtained on the 13th day of pseudopregnancy (Fig. 1) which show that the weights of the uteri are exactly the same. It is of further interest to note here that the morphology of the deciduomata is indistinguishable in the 2 experimental groups as well(3,5). Also, the involutionary process of the decidual reaction in both adrenalectomized and non-adrenalectomized rats indicates additional similarity. In brief, it is readily apparent that the absence of the adrenal glands does not modify the rate at which deciduomata undergo atrophy and total dissolution (Fig. 1). Thus, these data, obtained from gravimetric and histologic studies, support the idea that bilateral adrenalectomy does not modify the morphology and weight of the decidual reaction throughout its entire development and ensuing atrophy in the rat.

Our present knowledge of the physiologic activity of the adrenal glands during pregnancy, pseudopregnancy, and prolonged pseudopregnancy is so limited that it is not possible to speculate on the nature of the role of the adrenal glands during these physiologic states. Since it has been demonstrated that injections of adrenal cortical steroids and adrenocorticotropic hormone can inhibit decidual development and cause pregnant rabbits, rats, and mice to abort(6-8), it seems probable that in the normal animal a balanced relationship is maintained between these steroids and those responsible for the maintenance of pregnancy. That something of this nature might be so is indicated by recent reports showing that (a) placental extracts will decrease the size of the adrenal glands(9), (b) the weight of the adrenal glands decreases during the growth of deciduomata(10), and (c) adrenal cortex-like hormones have been isolated from human and equine placental tissue(11).

Summary and conclusions. Both histologic and gravimetric data show conclusively that the growth and subsequent regression of deciduomata in bilaterally adrenalectomized pseudopregnant rats are comparable in every respect to those formed in intact rats. Substitution therapy is not required when the adrenal glands are removed 12 hours after electrical stimulation of the uterine cervix.

1. Pomeau-Delille, G., *Compt. Rend. Soc. Biol.*, 1949, v143, 1251.

2. Swingle, W. W., Fedor, E. J., Barlow, G. Jr., Collins, E. J., and Perlmut, J., *Am. J. Physiol.*,

1951, v167, 593.

3. Hisaw, F. L., Velardo, J. T., and Dawson, A. B., *Anat. Rec.,* 1952, v113, 87.

4. Greep, R. O., and Hisaw, F. L., PROC. SOC. EXP. BIOL. AND MED., 1938, v39, 359.

5. Velardo, J. T., Dawson, A. B., Olsen, A. G., and Hisaw, F. L., *Anat. Rec.,* 1952, v112, 98.

6. Hisaw, F. L., and Velardo, J. T., *Endocrinology,* 1951, v49, 732.

7. Robson, J. M., and Sharaf, A. A., *J. Physiol.,* 1951, v114, 11p.

8. ———, *J. Physiol.,* 1952, v116, 236.

9. Vilardell, R., *Gynecol. et Obstet.,* 1929, v20, 65.

10. Velardo, J. T., and Hisaw, F. L., Unpublished data.

11. Johnson, R. H., and Haines, W. J., *Science,* 1952, v116, 456.

Received June 8, 1953. P.S.E.B.M., 1953, v83.

Effect of Thyroid Hormone on Growth of Thyrotrophin-Secreting Pituitary Tumors.* (20400)

EVELYN L. GADSDEN, AND JACOB FURTH.

From Biology Division, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Tumors of the pituitary develop in almost every mouse following destruction of the thyroid by I^{131}(1,2). These tumors secrete large quantities of thyroid-stimulating hormone (TSH)(3). The mechanism of the development of these tumors is not known with certainty. Lack of TH (thyroid hormone) provides the major stimulus for proliferation of TSH secreting cells, but whether or not ionizing radiation, incidental to radiothyroidectomy, is an essential contributing factor is under investigation(4,5). These induced tumors are readily transplantable on radiothyroidectomized but not on normal hosts(2). However, in the course of subpassages the tumors may gain autonomy and grow even better in normal than in radiothyroidectomized animals(3). Induction of the primary tumors can be prevented by administration of TH(6,7). If lack of TH is the stimulus for the growth of these tumor cells, can the growth of tumor grafts be prevented by TH? Will TH also affect the growth of autonomous tumors? Will thiouracil, an antithyroid compound which blocks the synthesis of TH, promote the growth of dependent tumors? The 3 sets of experiments now to be reported were designed to answer these questions.

Materials and methods. C57 black mice of both sexes were used. Transplantations of the I^{131}-induced pituitary tumors were made by cutting the tumor into fine particles in physiological saline and injecting it into the thigh muscle. Thyroid hormone was administered (a) by feeding desiccated thyroid in food or (b) by intramuscular injections or subcutaneous grafts of enlarged thyroids obtained from mice bearing autonomous grafted pituitary tumors. In one experiment (Table I) thyroids of tumor-bearing mice fed thiouracil for a long period of time were used. The desiccated thyroid† was mixed with ground Purina Chow, ½ g thyroid per 1000 g food. Each animal was fed approximately 3 g of this food mixture per day (1½ mg thyroid). Thyroids to be grafted were either cut into fine particles in physiological saline and injected in the muscle of the thigh or were grafted subcutaneously. Thyroid feeding was usually begun on the day of tumor grafting; the time relation is shown in the tables. Thiouracil‡ was administered as a 0.1% solution in drinking water given *ad libitum.* Thiouracil treatment was begun prior to tumor grafting in most experiments and at the time of tumor grafting in 2 experiments as indicated in Table III.

Results. Effect of TH on dependent tumors.

* Work performed under contract for the U. S. Atomic Energy Commission.

† "Thyroid Strong" obtained through the courtesy of Parke-Davis.

‡ Obtained through the courtesy of the American Cyanamid Co.