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Hypophysectomy in the Pregnant Guinea-Pig.*

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Observations regarding the effects of hypophysectomy during the course of gestation in the rat were reported.[1, 2] It was shown that the removal of the gland during the second half of pregnancy was followed by a lengthening of the gestation period by 3 to 4 days. In many instances normal young were delivered several days beyond term, and although the mammary glands were well developed, suckling was not observed. Furthermore, hypophysectomy even as early as the twelfth day of gestation had no effect upon the subsequent development of the corpora lutea of pregnancy. Such corpora lutea were in no way distinguishable from the corpora of a normal animal of the same day of pregnancy. Similar experiments have now been extended to the guinea pig and the original observation in the rat that the latter part of pregnancy is not interrupted by hypophysectomy has been confirmed.

Our findings in the rat have since been substantiated by Allen and Wiles[3] in the cat, and Selye, *et al.*,[4, 5] in the rat and mouse. The latter workers also found that milk secretion may take place for a very brief period but ceases within a few hours postpartum.

In all, 23 guinea pigs were used. Fifteen were hypophysectomized between day 34 and 36 of pregnancy, and 8 between day 40 to 41. Hypophysectomy on day 34 to 36 was invariably followed by resorption of the foetuses within 2 days after the operation. Animals subjected to the same operation day 40 to 41, delivered viable young at term. In contrast to the findings in the rat, the period of gestation was not significantly prolonged (63 to 67 days).

Three of the 8 animals which gave birth to normal young at ap-

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1 Pencharz, R. I., and Long, J. A., *Science*, 1931, **74**, 206.

2 Pencharz, R. I., and Long, J. A., *Am. J. Anat.*, 1933, **53**, 117.

3 Allen, H., and Wiles, P. J., *Physiol.*, 1932, **75**, 23.

4 Selye, H., Collip, J. P., and Thomson, D. L., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 589.

5 Selye, H., Collip, J. P., and Thomson, D. L., PROC. SOC. EXP. BIOL. AND MED., 1933, **31**, 82.

proximately normal term, were sacrificed within 12 to 18 hours postpartum. In 2 of them a small amount of milk could be expressed from the mammary glands. From the nipple of a third pig, a watery-like secretion but no milk could be expressed. The 5 remaining mothers were allowed to remain with their litters for about 10 days, but in no case were the young suckled. The guinea pig, therefore, may show as do the rat and mouse[4, 5] a slight postpartum secretion of milk.

At necropsy of the 3 pigs referred to above, it was seen that the mammary glands were considerably smaller than those of a normal postpartum animal. Microscopic examination of the glands showed that the galactophore system of the hypophysectomized animals had not attained their maximum development. Small quantities of milk could be detected in the ducts, but the picture of generalized lobular and alveolar distension typical of the normal lactating animal was lacking.

A comparison of the ovaries of the hypophysectomized animals shortly after parturition with those removed from a normal postpartum guinea pig, revealed that the ovaries of the operated animals had suffered extensive regression. This was especially brought out in the condition of the corpus luteum, which had undergone marked atrophy and showed few lipoid staining granules.

Of considerable interest also was the fact that relaxation of the pubic ligaments occurred normally in the absence of a well developed corpus luteum.

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Response of the Left Ventricle to Changes in Output.

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Previous studies on the mammalian heart have demonstrated that both the diastolic and systolic volumes increase with an increase in total output, mean arterial pressure remaining constant. (Patterson, Piper and Starling,[1] Wiggers and Katz[2]). Kozawa,[3] working with

[1] Patterson, Piper, and Starling, *J. Physiol.*, 1914, **48**, 465.

[2] Wigger, C. S., and Katz, L. N., *Am. J. Physiol.*, 1922, **58**, 439.

[3] Kozawa, S., *J. Physiol.*, 1914, **49**, 233.