

In the thyroid experiments, 2 thyroid glands from gill-less adults (South Hadley) were implanted bi-weekly into 20 gilled newts. No reduction of the gills was detected during the time that the animals survived, 10 to 27 days following the first transplant.

Throughout the experiments the gills appeared insensitive to pituitary and thyroid grafts although the condition of the sex organs, and the molting and emaciation indicated that the implants were potent in certain ways. However, during the winter and spring season here represented, the tempo of gill reduction was not accelerated by a dry environment nor by administration of endocrine glands.

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Homology of Prooestrous Bleeding in the Dog.

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The prooestrous uterine bleeding of dogs and menstruation of primates have been considered by some physiologists to be very similar and to represent in 2 classes of mammals the result of similar causative factors. (Heape,¹ Marshall.²)

We have obtained data from experiments conducted on dogs which we believe strongly indicate that the prooestrous bleeding of the dog is not homologous with the menstruation of primates. The evidence for this belief is as follows: (1) Ovariectomy of 5 dogs in the metoestrous phase did not result in external or profuse microscopical bleeding. In all 5 cases microscopical bleeding occurred as early as the 7th day and as late as the 16th day after ovariectomy. This bleeding was only of one or 2 days' duration. No external or microscopical bleeding was observed after ovariectomy of one immature dog and one dog in oestrus. Ovariectomy of monkeys results in external bleeding of about the same quantity as that seen at the normal menstrual period. (E. Allen³; Morrel *et al*.⁴; Saiki, in

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¹ Heape, W., *Quart. J. Micr. Science*, 1900, **44**, 1.

² Marshall, F. H. A., *Quart. J. Exp. Physiol.*, 1927, **17**, 205.

³ Allen, E., *Publ. Carnegie Inst. Washington*, 380. (Contrib. to Embryol., 19, 1.)

⁴ Morrell, J. A., Powers, H. H., Varley, J. R., and de Frates, J., *Endocrinol.*, 1930, **14**, 174.

press.) (2) Injection of alkaline extracts of the anterior lobe of the hypophysis[‡] which contained the gonad stimulating hormones into 2 dogs with ovaries intact resulted in external bleeding during the period of injection. This bleeding stopped soon after the injections had been discontinued. In monkeys profuse microscopical or external bleeding does not occur during the injection period. A latent period of some days intervenes between the cessation of injection and the appearance of blood. (Hartman⁵; Saiki, in press.) (3) Control experiments in which castrated dogs were injected with quantities of the anterior lobe extracts sufficient to produce external bleeding in the intact animal did not result in profuse microscopical or external bleeding. In 2 of the 3 dogs injected in this experiment a few red cells were seen in the lavage on one or 2 days of the injection period. The presence of these cells we do not interpret as being significant in the consideration of the causation of the prooestrous bleeding. (4) Injection of oestrogenic substances (amniotin, theelin) in large amounts (1100-3000 r.u.) into 5 castrate dogs produced macroscopic external bleeding in all cases during the injection period. As observed in the case of administration of anterior lobe in the intact dog, external and microscopical bleeding stopped soon after the injections had been discontinued.

Administration of oestrogenic substances to monkeys does not produce a profuse microscopical or external bleeding during the period of injection. External bleeding is found to occur a few days after the injections have been discontinued. (E. Allen³; Morrell *et al*⁴; Saiki, in press.) (5) Biopsies of the uteri of dogs taken at the time of maximum bleeding (produced either by anterior lobe extracts in intact dogs or oestrous hormone in castrate dogs) did not show upon microscopical study any of the characteristic changes seen in the primate uterus at the time of menses. (Menses with or without a corpus luteum.) (E. Allen³ and Corner.⁶) (Marshall and Jolly⁷ state that epithelial degeneration does occur in the uterus of the dog during prooestrous bleeding. However, we have not seen definite alterations in the epithelium of the uterus of the dog at

[‡] We are very grateful to Parke, Davis and Co. for furnishing us with the anterior lobe extracts and the theelin, and to E. R. Squibb and Sons for the amniotin.

⁵ Hartman, C. G., Firor, W. M., and Geiling, E. M. K., *Am. J. Physiol.*, 1930, **95**, 662.

⁶ Corner, G. W., *Publ. Carnegie Inst., Washington*, 332. (Contrib. to Embryol., 15, 73.)

⁷ Marshall, F. H. A., and Jolly, W. A., *Phil. Trans. Royal Soc., London*, 1905. 198 B, 99.

the time of bleeding which we are willing to call degenerative.) There is much extravasation of blood into the subepithelial tissue of the dog during the bleeding but no lacunae of blood are seen such as those found in the menstruating primate uterus. The stromal tissue in the areas of extravasation does not appear to be degenerated. These findings are in accord with the general opinion that stromal degeneration does not take place in the uterus of the dog at the time of the prooestrous bleeding.

These data demonstrate that the prooestrous bleeding of the dog is produced by direct or indirect action of the oestrous hormone on the uterus. We believe the mechanism by which this hormone produces its effect cannot be considered to be identical with that concerned in the production of uterine bleeding in primates.

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Rate of Beat Over Long Time Periods of Isolated Turtle Hearts Treated with Thyroxin.

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The question arises whether the marked increase in rate of heart beat which develops in hyperthyroid and in thyroid fed animals will appear in isolated hearts treated with thyroxin if a sufficient time is allowed for the action of the hormone. Lewis and McEachern¹ have shown that hearts removed from thyroid fed, or thyroxin treated rabbits maintain a 50% increase in rate for 8 to 10 hours, and that normal excised rabbits' hearts show no immediate effect of thyroxin.

We have kept excised turtle hearts at $20^{\circ}\text{C.} \pm .02^{\circ}$ for 60 hours, recording automatically the rate during this period by means of the Loomis chronograph.² The heart was tied by the tips of the auricles to a heart lever and suspended in a modified Ringer's solution, containing 0.1% glucose and phosphate buffer to $\text{pH} = 7.3$, oxygenated by pure O_2 gas. Addition of thyroxin*, dissolved in a minimal

¹ Lewis, J. K., and McEachern, D., *PROC. SOC. EXP. BIOL. AND MED.*, 1931, **28**, 504; *Bull. Johns Hopkins Hospital*, 1931, **48**, 228.

² Loomis, A. L., Harvey, E. N., and MacRae, C., *J. Gen. Physiol.*, 1930, **14**, 105.

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