acid-fast strains of an extreme and rather unique R form of the avian bacillus as previously reported. More recently this R form has been dissociated to an avian S culture, serologically and in virulence essentially the same as the original. Thus the last step in the cycle is complete.

Summary. Human brain from which the lipoids have been partially extracted with alcohol and benzol has, in our hands, been successful in yielding the filtrable and non-acid-fast cyclostages of the avian S tubercle bacillus. This appears to be due to two chief factors: (1) the lipoids functioning possibly in a metabolic way; (2) a reducing substance which provides an oxidation-reduction potential of suitable range.

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Replacement of Gonadotropic Action of Pituitary in the Hypophysectomized Rat.

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We have pointed out that the administration of anterior-pituitary-like hormone (A.P.L.) to the hypophysectomized rat cannot prevent the degenerative changes in the ovary which invariably occur after the removal of the pituitary.[1] We also found that it is impossible to induce maturation of follicles and corpus luteum formation in the hypophysectomized rat with A.P.L. injections. In the absence of the hypophysis, A.P.L. leads only to the luteinization of thecal cells but it does not act upon the ovary as it would under normal conditions. The present experiments show us that it is possible to obtain both follicle maturation and corpus luteum formation in the hypophysectomized rat if certain pituitary extracts are administered simultaneously with A.P.L.

In the first series, 6 rats were hypophysectomized when 22 days old, and from that time they received 0.5 cc. of a 0.5% aqueous ammonia extract (1 cc. = 1/10 gm. of anterior lobe tissue), and 25-50 units of A.P.L. daily for 9 days. They all showed squamous vaginal smears on the fourth to the sixth day, and the histological appearance of their ovaries was the same as that of normal immature

[1] Collip, J. B., Selye, H., and Thomson, D. L., *Nature*, 1933, **131**, 56.

females receiving A.P.L. Numerous corpora lutea and mature follicles had been formed in these immature rats in the absence of living pituitary tissue.

In the second series, 7 postpubertal female rats, weighing 72-129 gm., were hypophysectomized and treated with 100 units of A.P.L and ¼ cc. of the same ammoniacal pituitary extract daily for 14 to 24 days. At autopsy they showed numerous corpora lutea, some of them quite recent (Fig. 1). Their ovaries were enlarged, weighing between 43 and 156 mg. Similar results were also obtained with the combination of A.P.L. and aqueous acetic acid extract of the pituitary.

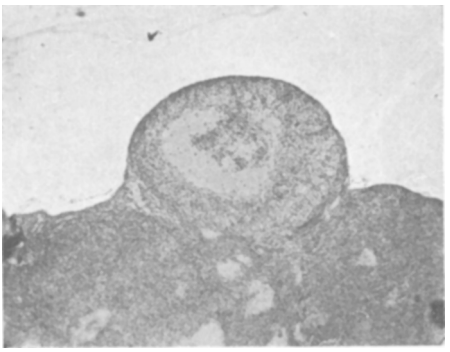

FIG. 1.

Recent corpus luteum, still showing a cavity in its center, in the ovary of a postpubertal hypophysectomized rat (complete removal of the pituitary checked at autopsy), treated with A. P. L. and the ammoniacal pituitary extract.

These experiments show that A.P.L. leads to follicle maturation and corpus luteum formation only in the presence of some pituitary factor which can be replaced in the hypophysectomized animal by the administration of suitable pituitary extracts which in themselves are much less active.

Evans[2] thought that the growth hormone of the pituitary is turned into the maturity hormone by a catalytic action of prolan, whereas Smith[3] reported experiments which induced him to believe that the maturity hormone and A.P.L. are synergistic. Synergism between A.P.L. and the pituitary certainly exists; but we do not feel that it has been definitely proved that the substance which is necessary for the normal action of A.P.L. on the ovary, and which is produced by the pituitary, is identical with any of the known hormones of the hypophysis. As a working hypothesis we simply

[2] Evans, H., *et al.*, *Am. J. Physiol.*, 1932, **100**, 141.

[3] Smith, P. E., reported A. A. A., Section N, Atlantic City, December 28, 1932.

assume, therefore, that a complementary substance is furnished by the pituitary which cooperates with A.P.L. in its effect on the ovary. Whether this substance is identical with any of the known pituitary hormones or not remains to be proved, although experiments now under way in this laboratory seem to indicate that this complementary substance is not identical with the known pituitary hormones.

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Automatism of Anuran Lymph Hearts as Obtained by Transplantation.

MARION A. REID. (Introduced by F. H. Pratt.)

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Although the normal lymph hearts of Anura are typically neurogenic (Brücke and Umrath[1]) even to being homolaterally synchronized (Pratt and Reid[2]) the beating of these organs *in situ* after interruption of the spinal nerve impulses has often been observed. Such preparations, even if intrinsically ganglion-free, do not altogether eliminate the possibility of some peripheral nervous influence. Moreover, the full, regular beats of excised lymph hearts in isotonic salt solutions originally observed by Moore[3] were not obtained by Brücke,[4] whose results by the same method (irregular contractions like the fibrillations of the blood heart) have since been confirmed by the writer. The method here described, permitting indefinitely continued observation with isolation in a favorable environment, has made possible the recognition and detailed study of a fully developed automatic rhythm.

An anterior lymph heart exposed by the dorsal route is cut away from the surrounding muscles, the hooked transverse process of the third vertebra, and the vertebral vein. The tongue is everted and a small incision made in the basihyoid (retrolingual) membrane near the posterior border of the underlying lymph sac (sinus basi-

[1] Brücke, E. T., and Umrath, K., *Pflüger's Arch.*, 1930, **224**, 631.

[2] Pratt, F. H., and Reid, M. A., PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 1019.

[3] Moore, A., *Am. J. Physiol.*, 1901, **5**, 87, 196.

[4] Brücke, E. T., *Pflüger's Arch.*, 1906, **115**, 334.