

muscle. After allowing the heart to return to normal by perfusing with Ringer's solution only, the above effects of the drug could be demonstrated as often as desired. This increase in amplitude was accompanied by either a slight decrease or no change in the rate. When the concentration of the drug was increased to one in 300 there was a marked decrease in the relaxation of the ventricle and in a short time the heart was arrested in systole; there was also a decrease in the number of impulses sent out by the sinus so that the heart was slowed.

Pancoast<sup>1</sup> found the fruit of *Ilex opaca* to contain tannin, pectin, albumin and 2 crystalline principles and organic salts of potassium calcium and magnesium. Venable<sup>2</sup> extracted from the leaves of the Yopon (*Ilex cassene*, Linn.) a white crystalline substance which he believed to be caffeine. In some respects the tracings made in this work resemble those obtained by Heathcote<sup>3</sup> and by Roth<sup>4</sup> on perfusion of the frog's heart with the zanthine compounds. However, on close examination there are certain features such as the systolic standstill which suggest a digitalis-like action.

An attempt to isolate the principle responsible for the characteristic effects and a more extensive investigation of the pharmacological action of the drug is now being carried out.

## 5628

### Effect of Corpus Luteum Extracts in Suppressing Ovarian Activity in the Rat.

HOWARD T. GRABER AND RUSSELL A. COWLES.

(Introduced by H. B. Lewis.)

*From the Research Laboratories of the Digestive Ferments Company,  
Detroit, Mich.*

Recent studies in this laboratory have confirmed the results of Payne, Peenan and Cortland,<sup>1</sup> Haterius and Pfiffner,<sup>2</sup> and Macht, Stickels and co-workers<sup>3</sup> on the inhibition of normal ovarian activity by preparations of the corpus luteum.

---

<sup>1</sup> Pancoast, D. P., *Am. J. Pharm.*, 1856, **28**, 314.

<sup>2</sup> Venable, E. P., *Am. J. Pharm.*, 1885, **57**, 390.

<sup>3</sup> Heathcote, R., *J. Pharmacol. Exp. Therap.*, 1920, **16**, 327.

<sup>4</sup> Roth, G. B., *J. Pharmacol. Exp. Therap.*, 1927, **30**, 321.

<sup>1</sup> Payne, Peenan and Cortland, *Am. J. Phys.*, 1928, **98**, 243.

<sup>2</sup> Haterius, H. O., and Pfiffner, J. J., *PROC. SOC. EXP. BIOL. AND MED.*, 1929, **26**, 818.

<sup>3</sup> Macht, D. I., and Stickels, A. E., *Am. J. Phys.*, 1929, **88**, 65.

The experiments herein reported were carried out on our laboratory strain of albino rats. The general plan was to take a series of mature animals and follow the oestrus cycle for a period of time to be certain that all animals were normal. The animals were then to be treated with corpus luteum extracts to determine any effect on the length of the cycle. In certain cases control extracts, prepared from the anterior lobe and thymus and containing approximately the same total solids, were also used.

Due to the well known fact that the length of the cycle is profoundly influenced by the general health and environment of the animal, all precautions were taken to keep the animals under uniform conditions during the course of the experiment. In each experiment a number of rats were used to determine the control cycles, but usually only about 50% of these showed a regular cycle and could be used in the experiment.

The corpus luteum extracts, as well as the control extracts of anterior pituitary and thymus, were prepared by acid alcohol extraction of either fresh glands or carefully desiccated glands with the subsequent conversion of the active material into an aqueous solution. No difference was noticed between the fresh glands and desiccated glands as the source of active material. All injections consisted of 1 cc. of sterile solution and were given intramuscularly.

The rats used in these experiments were from 3 to 4 months old and weighed from 150 to 175 gm. We found that in rats weighing much less than 125 gm. the cycles were too irregular to be used for this work. During the course of the experiment the animals, with very few exceptions, gained from 2 to 5 gm. in weight each week. This fact, along with the general physical appearance of the animals seemed to indicate no deleterious effect from the extracts.

TABLE I.—*Results.*

Exp.	No. of Rats	1 cc. Fresh Gland	No. Control Cycles	Aver. Cycle Days	No. Treated Cycles	Aver. Cycle Days
I	8	Corpus Luteum 6½ gm.	34	4.7	27	8.2
II	4	Anterior Lobe 4 gm.	13	4.8	12	5.2
III	6	Corpus Luteum 5½ gm.	20	4.4	14	8.2
IV	5	Thymus Solution, 5½ gm.	17	4.4	19	4.2

The results appearing in our first experiments seemed very conclusive since the control cycles were very uniform (over 90% being

either 4 or 5 days), whereas the treated animals showed a marked reaction to the extract and showed cycles ranging as high as 13 days in length. In sharp contrast, the solutions prepared from anterior lobe and thymus and containing approximately the same total solids were apparently without effect on the normal cycle. On a repetition of the first experiments, using a more dilute extract of corpus luteum, essentially the same result was obtained.

Since all extracts contained approximately the same total solids and very little protein, it seems that the corpus luteum extracts did contain some factor which acted directly in inhibiting ovarian activity and the effect was not merely due to an impairment of the general bodily metabolism.

## 5629

### A Conditioned Emetic Reflex in the Pigeon.

OSCAR RIDDLE AND FRANCES H. BURNS.

*From Carnegie Institution of Washington, Station for Experimental Evolution, Cold Spring Harbor, N. Y.*

In 1912 one of us administered a series of daily doses of yohimbine hydrochloride to several pairs of pigeons and doves which were kept in quite large cages. It was our custom to walk into a cage, catch the pair of birds, and then place the dry pellets of the drug into the upper throat with long, curve-tipped artery forceps. These pellets were readily swallowed but, unless restrained, many of the birds almost immediately regurgitated part or all of the contents of their crops. Several days after beginning this treatment it was observed that some of these birds began to vomit as soon as the person administering the drug entered their cage for this purpose—and *before* the bird was caught for dosage. Not all of this group of birds were seen to give this response, and complete records of the behavior were not obtained; those tests were made for a wholly different purpose and were not favorable to a study of the conditioned reflex. Recently we have repeated these tests on mature and immature ring doves, definitely attempting to provide *equal* externals and stimuli to the several birds, and also making complete records concerning the time and degree of exhibition of both the normal and the conditioned reflex in each of the birds tested. It is the purpose of this paper to report, without further analysis, the