

renals were enlarged, and most enlarged in the middle of the ovulation period. The diseased birds fail to show this relation; and, though these glands are larger than the normals in the periods most removed from ovulation, they do not show a comparable enlargement during ovulation.

The appearance of the hypertrophied glands in the normal birds is otherwise wholly normal. Their appearance certainly suggests an increased activity of the glands during this period. Sections of the gland have not been made and we do not know whether both parts share in the hypertrophy. If increased secretion occurs, it doubtless has an important bearing upon the general physiology of the gland; and upon the effects which "reproductive overwork" (Whitman, Riddle) has been found to produce on the egg size and offspring of pigeons; for, a bird made to produce as many as 30 or 40 pairs of eggs per year would thus be almost continuously subjected to a hypersecretion of the suprarenals.

123 (1870)

Studies in the physiology of vitamins. III. A comparison of the effects of feeding extracts of muscle and yeast respectively.

By GEORGE R. COWGILL.

[From the Sheffield Laboratory of Physiological Chemistry in Yale University, New Haven, Conn.]

In a previous communication¹ experiments were reported wherein it was shown that the feeding of extracts of rice polishings, wheat embryo, and navy bean to dogs which had been fed on a diet lacking vitamin-B resulted in a recovery of appetite which lasted for varying periods. Vitamin-B was suggested as the appetite-promoting factor in the preparations used. The present report concerns control experiments in which an extract lacking this factor was tested.

Commercial Liebig's extract of beef muscle and the extract of yeast vitamin as prepared by the Harris Laboratories were used for these experiments. Tests were made using the Liebig

¹ Cowgill, PROCEEDINGS SOC. EXP. BIOL. AND MED., 1921, xviii, 290-291.

extract administered either with single large doses or with large doses repeated daily for as many as fourteen (14) days, the material being introduced by stomach sound in order to eliminate the taste factor. In another series of experiments the meat extract was mixed with the food which had been refused. The meat extract did not restore the appetite to such animals. On the other hand relatively small amounts of the yeast extract given by stomach produced a prompt recovery of appetite which lasted for from four (4) to nineteen (19) days depending on the amount administered.

Liebig's extract in doses such as were employed in these experiments promotes the flow of gastric juice in normal animals.² This fact, together with our own observation that products containing vitamin-B do not promote the flow of saliva, pancreatic juice, or bile,³ suggests that the recovery of the desire to eat in our animals is not to be ascribed to an increased flow of gastric juice.

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**Studies in the physiology of vitamins. IV. Parenteral administration of products containing vitamin-B—
mammalian experiments.**

By **GEORGE R. COWGILL.**

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That relief from the symptoms due to a lack of vitamin-B in pigeons may be brought about in a very short time by intramuscular injection of products containing this vitamin has been shown by many investigators. Studies of parenteral administrations of vitamin-B to mammals do not appear to have been made. In the course of our studies into the physiology of this vitamin, using dogs as experimental animals, the protein-free concentrate of vitamin-B from yeast as prepared by the Harris Laboratories

² Pawlow, "The Digestive Glands," 1902, 96.

³ Cowgill, PROCEEDINGS SOC. EXP. BIOL. AND MED., 1921, xviii, 148-149; *ibid.*, 290.