responded positively, either large corpora hemorrhagica or corpora lutea resulting. Controls given corresponding amounts of blood from unbred females or from males failed to respond. The results of the positive experiments are tabulated.

Urine collected from bred animals at periods of 8 and 12 hours post-coitum gave no response in immature rats.

Extracts of blood serum obtained by fractional precipitation with sodium sulfate from donors killed at varying times post-coitum and injected into immature rats in amounts equivalent to 50 cc. of blood serum gave no response.

Conclusions. Some evidence was obtained supporting the theory that ovulation in the rabbit occurs as a result of an increased production of anterior lobe hormone.

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Coprophagy as a Source of Vitamin B (B_1).

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Many experimental investigations with animals on simplified food mixtures have indicated that the consumption of their own feces contributes something nutritionally beneficial, due either to unassimilated food residues or to a synthesis by bacteria in the intestinal tract. The report of Fridericia and coworkers[1] on the phenomenon which they termed "refection," whereby young rats deprived of the vitamin B-complex may recover "spontaneously" from the effects of this deficiency and may transmit this immunity to the need for vitamin B in the diet to other rats has been confirmed by several other investigators.[2, 3, 4, 5] According to these investigators the presence of a large proportion of *raw* starch in the vitamin B-deficient diet is an essential condition for the occurrence of refection. Mendel and Vickery[6] were unable to secure refection when they attempted to reproduce the conditions described by the Euro-

[1] Fridericia, L. S., *et al., J. Hyg.*, 1927, **27**, 70.

[2] Roscoe, M. H., *J. Hyg.*, 1927, **27**, 103.

[3] Kon, S. K., and Watchorn, E., *J. Hyg.*, 1928, **27**, 321.

[4] Roscoe, M. H., *Biochem. J.*, 1931, **25**, 2056.

[5] Kon, S. K., *J. Hyg.*, 1931, **31**, 543.

[6] Mendel, L. B., and Vickery, H. V., PROC. SOC. EXP. BIOL. AND MED., 1929, **26**, 552.

pean investigators. Steenbock, Sell and Nelson,[7] using diets deficient in vitamin B and containing a large proportion of dextrin rather than raw starch, considered that the beneficial effects of coprophagy in their rats receiving inadequate addenda of vitamin B were due to unabsorbed vitamin B, since in the absence of vitamin B addenda coprophagy did not prolong life. Roscoe[4] studied the effects of coprophagy with young rats deprived of vitamin B, or vitamin B_1 and B_4. When the diet contained raw rice starch the animals were not benefited by coprophagy unless they chanced to have become refected. If this same diet was steamed for 3-4 hours, the animals did not become refected but could grow at a fairly good rate provided a *large proportion* of the excreted feces was consumed by them.

The present investigation was undertaken to ascertain to what extent our vitamin B (B_1) studies may be expected to be influenced by the interfering factor of coprophagy. Young albino rats reared to 28 days of age by mothers whose diets consisted principally of milk powder and ground whole wheat were caged on raised mesh screens and were fed the vitamin B(B_1) deficient diet previously described by Sherman and Chase.[8] This diet consists of casein (extracted) 18%, Osborne and Mendel salt mixture 4%, butterfat 8%, cod-liver oil 2%, autoclaved baker's yeast 15%, and *raw* cornstarch (Duryea) 53%. When the animals had reached stationary weight, which occurred regularly after 12 to 16 days, the animals of each litter were divided into 2 groups, matched as to size and sex and transferred to individual cages with raised mesh screens.

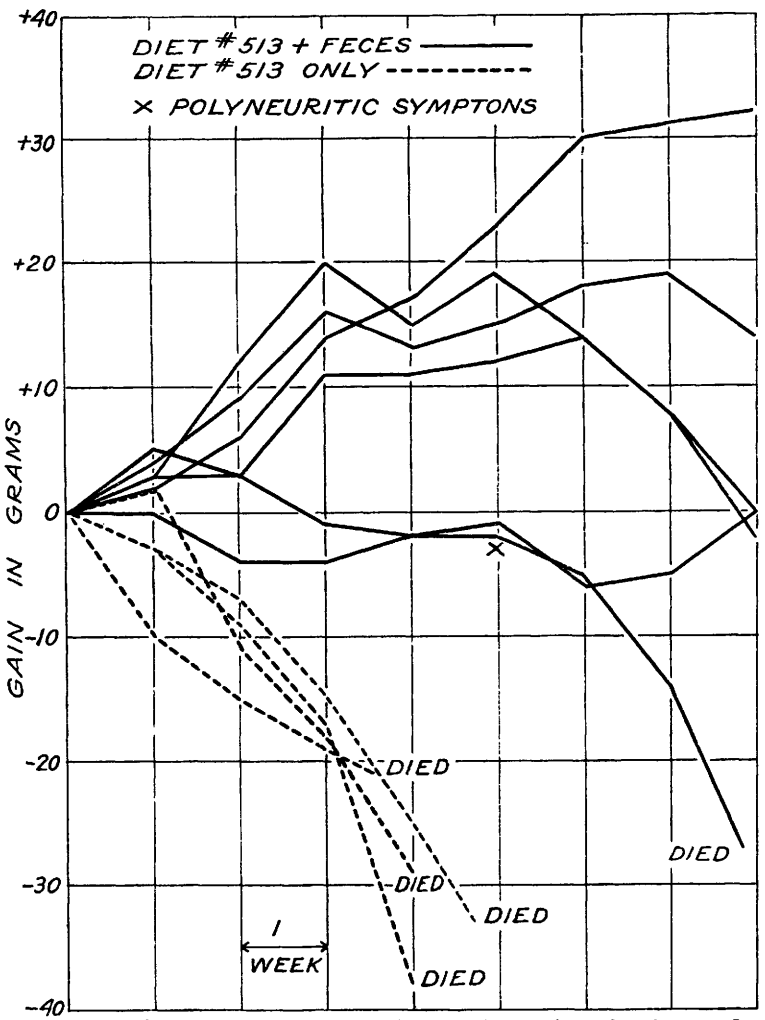
One group was continued on the vitamin B(B_1) deficient diet without supplement and all died within the usual time, 24 to 33 days beyond the time at which they had reached stationary weight. In several instances animals of this group were known to have acquired and consumed small quantities of their feces but in all cases the decline in weight was uninterrupted throughout the experimental period. Each rat of the second group was given in addition to the basal ration the total of its own feces for the first week, and for the remainder of the experimental period the daily feces supplement was reduced to 1.0 gm. per day if the amounts excreted exceeded this quantity and the entire amounts excreted if these were less than 1.0 gm. per day. The feces consumed by these animals ranged from 66 to 97% of the amounts excreted after the first week.

[7] Steenbock, H., Sell, M. T., and Nelson, E. M., *J. Biol. Chem.*, 1923, **55**, 399.

[8] Sherman, H. C., and Chase, E. F., *J. Am. Chem. Soc.*, 1931, **53**, 3506.

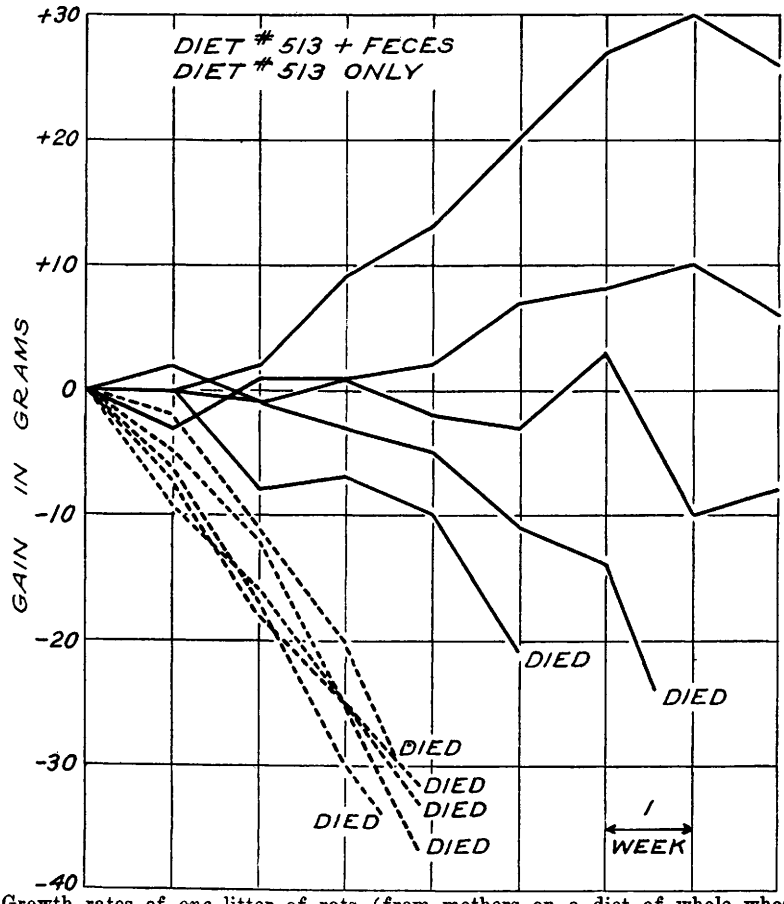
All of the rats receiving their own feces as a supplement to the vitamin B(B_1) deficient ration were distinctly benefited by this supplement as shown by the fact that they invariably lived longer and either lost weight less rapidly than the control animals or grew, usually at a very slow rate. Of the 11 animals which were fed feces only one developed symptoms of polyneuritis, 3 died before the end of the 8 weeks experimental period having shown a slow decline from the start, and 8 grew but did not grow continuously for 8

FIG. I



Growth rates of rats (whose mothers' diets consisted of whole wheat and milk powder) on a vitamin B(B_1) deficient diet with and without addenda of their own feces.

FIG. II



Growth rates of *one* litter of rats (from mothers on a diet of whole wheat, whole milk powder and lean beef) on a vitamin B(B_1) deficient diet with and without addenda of their own feces.

weeks, indicating that the feces had become less potent as vitamin B(B_1) sources or that a second growth limiting factor had become exhausted or insufficient. The growth curves of the rats taken from two previous nutritional histories are shown in figures 1 and 2. Three animals not included in the figures made small gains in body weight when fed 100% of their own feces for one week, but lost weight promptly and steadily when the feces were omitted from their ration in spite of the occasional acquisition of feces due to artifices on the part of the animals.

Conclusions. (1) Eleven rats receiving the Sherman and Chase basal ration deficient in vitamin B(B_1) and containing 53% of *raw* cornstarch, when fed 66 to 97% of their own feces as addenda

were benefited as compared with littermate controls on the same ration without addenda. (2) The greatest growth resulting from feeding the rats 66 to 97% of their own feces was 4 gm. per week; most of the animals grew much less or declined steadily but more slowly than the control animals. (3) It would seem that vitamin B(B_1) studies, using the assay method outlined by Sherman and Chase, were not seriously encumbered with disturbing influences of coprophagy since the small amounts of feces ordinarily consumed by the animals are not sufficient to influence their growth rates appreciably.

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Bacteriophage in Experimental Staphylococcal Septicemia.

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The principles of phage therapy have been developed upon 2 cardinal assumptions: 1. That an active homologous bacteriophage introduced into a host harboring a pathogenic organism in the tissues will propagate at the expense of the disease incitant, eventually causing the latter's widespread lytic destruction and constituting as a consequence a benign *therapia sterilisans* with no danger of untoward response on the host's part such as might attend use of germicidal drugs. 2. That phage lysates contain in solution certain constituents of bacterial cells released at the time of lysis. These substances are capable of inducing antibody responses upon contact with animal tissues and may be expected effectively to produce an active immunity. With a few notable exceptions, studies on phage therapy in experimental infections have been directed largely toward evaluation of phage as a possible therapeutic modality, as is, of course, also the case with purely clinical observations. However, the primary action anticipated in the application of phage to the treatment of diseases, i. e., massive bacterial dissolution *in vivo* has not been subjected to any critical experimental analysis so far as the authors are aware. Since any accepted concept of phage action will have definite influence upon the manner in which phage is applied clinically and also upon the nature and extent of our clinical expectations, a series of experiments was undertaken to investigate whether conditions essential for bacterial lysis can develop in animal