but in 7 (63.6%) bodies similar to those seen in Series A were found within the space between the cuticle of the larvae and their sheaths.

Series C. Forty-three larvae were matured in the original filtrate from the Baermann isolator. This filtrate contained colon bacilli and staphylococci as determined by culture. The larvae were examined at intervals up to the sixteenth day after the second ecdysis. Twenty-two (51.1%) presented one or more bacteria-like bodies within their sheath spaces but none within their alimentary tracts. The average number of such particles was 12 per larva.

Of the total of 79 larvae of the 3 series 38 (48.1%) showed the presence of bodies of bacterial morphology and magnitude within some portion of their alimentary tracts or sheath spaces.

It cannot be positively asserted at this time that these bodies are actually bacterial or even viable.

Preliminary experiments have been performed with the purpose of liberating these bodies by amputation of the tail end of the sheath. Results have shown certain evidence that the particles in question are actually bacterial and can be cultured. This will be investigated further.

Conclusions. 1. The mouth parts and alimentary canal of immature larvae of *Necator americanus* are of such size as to accommodate particulate matter of bacterial magnitude. 2. Particles morphologically resembling colon bacilli and staphylococci have been seen within various portions of the alimentary canal of immature larvae of *Necator americanus* which had been living in a medium containing these micro-organisms. 3. Sheathed larvae of *Necator americanus* have been seen to carry bacteriform bodies within their sheath spaces for periods of from 1 to 31 days after the second ecdysis.

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Observations on the Nutritive Value of Certain Fats.

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In connection with experiments concerned with the growth of rats on low-fat diets, observations have been made which emphasize the nutritive value of certain fats, and illustrate the marked variance in

the results obtained in different laboratories with a fat such as cod liver oil. The basal diet introduced by Burr[1] (purified casein —25, commercial sucrose —75, modified Osborne and Mendel salt mixture —4) was used and was supplemented daily with 0.5 gm. of whole dried yeast and 9 drops of cod liver oil unless stated otherwise. On this diet male rats, 4 weeks of age, increased in weight to 200 gm. in approximately 60 days. These rats (Group 1) exhibited feet and tail signs apparently indentical with those noted by Burr and Burr[2, 3] in rats on a fat-free diet. The more serious effects reported by these authors were not evident in our experiments, possibly because we used whole yeast in place of ether-extracted yeast and cod liver oil in place of the non-saponifiable fraction of that oil. The feet and tail signs were not prevented by doubling the daily yeast supplement (Group 7), or by adding an active extract of rice polishings (Group 10) or by adding an active extract of liver (Group 8). The signs were, for the most part, prevented by wheat germ oil (Group 4), lard (Group 6), and whole liver (Group 9). Wheat germ oil was most effective, and lard was least effective, although the effect of the lard was greater when the daily supplement of cod liver oil was decreased (Group 5). The severity of the condition of the tails of the rats given 12 drops of cod liver oil daily was even worse than that of the animals given 9 drops daily. It was evident that the total fat in these diets was secondary in importance to the ratio of cod liver oil to the other fats (Groups 2, 3 and 4).

Changes in the feet and tail of the rat have been reported by other investigators and appear to be associated with various types of nutritive deficiencies.[4, 5, 6, 7] However, the condition in our rats seemed to be due to the same cause as that reported by Burr and Burr, since it was prevented by wheat germ oil, lard and whole liver and was not prevented by yeast or other sources of the vitamins B_1 and B_2. On the other hand, our results differed markedly from theirs in that the signs appeared on a diet which was not free from fat and which contained cod liver oil. Burr and Burr found that 3

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drops of cod liver oil daily were very effective in preventing the signs.

TABLE I.

Group	No. of rats showing feet or tail signs after 60 to 80 days on diet.			Daily dietary supplement	
	+	±	—	Yeast gm.	Cod liver oil drops
1	12	1	1	0.5	9
2	10	0	0	0.5	12
3	6	2	2	0.5	9 + 3 drops lard
4	0	2	8	0.5	9 + 3 drops wheat germ oil
5	0	2	8	0.5	3 + 6 drops lard
6	0	1	9	0.5	9 (10% lard in basal diet)
7	9	1	0	1.0	9
8	10	0	0	1.0	9 + 0.5 cc. aqueous liver extract
9	0	3	7	0.5	9 + 0.5 gm. whole dried hog liver
10	10	0	0	0.5	9 + 4 drops extract of rice polishings (tiki tiki)

Recent investigations in several laboratories[3, 8, 9] have emphasized the need for caution in stating the dietary requirements of the growing rat, the experimental animal most commonly used in nutrition experiments. It is possible that failure to recognize the presence of variable amounts of the known dietary factors and also of variable amounts of known and unknown toxic substances in such standard basic food materials as cod liver oil and yeast may be largely responsible for the confusion which exists at present concerning the essential constituents of the diet. Obviously, additional information is required before it may be stated that the feet and tail signs in our experiments were the result of a deficiency in any food factor or the result of a toxic substance present in the cod liver oil used.

The data on the growth, food consumption and water intake of these rats will be reported later.

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