

of bacteria suspended in normal room air or air infected with a fine spray of beta hemolytic streptococcus Group C.

Sampling of Bacteria in Textiles. Large numbers of beta hemolytic streptococci and other organisms were collected from bed-clothes of scarlet fever patients (Table II), when the device was arranged for textile sampling. Although as convalescence progressed it became increasingly difficult to recover streptococci from blankets and sheets, large numbers of miscellaneous bacteria continued to be obtained. Only a rather small fraction of the total bacterial population is removed by one brief sampling; a second test of the same area gives nearly as high a bacterial count. The number of bacteria recovered was not closely related to the area of sampling, but depended more on other factors now under investigation.

Discussion. Bubbling air through liquids has not been widely used as a means of trapping air-borne bacteria. Some of the previously described methods have been unsuitable for use because of their slow rate of air flow (Rettger's "aeroscope" samples only one-half liter of air per minute), others because

of incomplete removal of bacteria which escape to the surface in large air bubbles. The Wheeler bubbler⁹ avoids the latter objection by the use of glass beads to break up bubbles, but suitable beads are difficult to obtain and tend to devitrify after prolonged use, with consequent bactericidal alkalization of the collecting broth. The surprisingly high efficiency of the Folin bubbler in recovering air-borne bacteria may be due to the use of a very rapid air flow, which causes many bacterial particles to impinge on the test tube wall, and produces so great an agitation of the fluid that few large air bubbles are able to rise unbroken to the top of the tube.

Summary. A method is described for collection of air-borne bacteria, by means of dispersing air at a rate of 30 liters per minute from a Folin aeration tube into 20 cc of broth contained in a test tube. The apparatus is about 90% efficient, is readily constructed from simple equipment, and may be adapted to estimation of the bacterial content of textiles.

⁹ Wheeler, S. M., Foley, G. E., and Jones, T. D., *Science*, 1941, **94**, 445.

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Essential Fatty Acid Deficiency in the Mouse.

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It was first shown by Burr and Burr¹ that on a diet devoid of fat but otherwise adequate, rats develop deficiency symptoms characterized by retardation of growth, a scaly dermatitis, necrosis of the tail, and kidney lesions and hematuria. Subsequent experiments of the same workers showed that this condition could be cured or prevented by the inclusion in the diet of certain unsaturated fats, such as lard or corn oil, or unsaturated fatty acids

such as linoleic acid. These observations have been confirmed by other workers. In the experiments herein described the fat deficiency syndrome has been produced in mice.

Seven weanling rats of the Wistar strain reared in our laboratory were used to check the purity of the diet and to serve as a criterion for the results to be obtained with mice. Their diet consisted of 24% casein, 72% sucrose, and 4% salts (Osborne and Mendel), with daily supplements of 0.65 g of Northwestern Yeast and an equivalent of 70 mg of cod liver oil as the unsaponifiable fraction. After their weight reached 100 g, the

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¹ Burr, G. O., and Burr, M. M., *J. Biol. Chem.*, 1929, **82**, 345; 1930, **86**, 587.

protein was reduced to 16% and the sucrose increased proportionately. All dietary constituents and supplements were prepared and rendered fat-free according to the methods of Burr and Burr. On this ration, the rats survived an average of 21 weeks. Slight symptoms of a scaly dermatitis were evident about the seventh week. The ringed, scaly, and necrotic tail condition, and the presence of blood in the urine were not fully apparent until the 17th week. The animals gained about 100 g during the first 10 weeks, after which the rate of growth decreased.

The mice used were weanling albino animals from a strain reared in our laboratory over the last 8 years. They were given a diet composed of casein 28%, sucrose 65%, and salts (Osborne and Mendel) 7%, supplemented daily with 0.2 g of Northwestern Yeast and an equivalent of 40 mg of cod liver oil as the unsaponifiable fraction. All material was prepared in the same manner as for the rats. The majority of the forty-seven mice used survived an average of 11 weeks, the others dying during the first few weeks from self-imposed starvation. The animals gained in weight during the first 5 weeks, after which their weight remained fairly constant (Fig. 1). The earliest symptom of the deficiency (30-40th day) was the appearance of a dandruff-like dermatitis at the scruff of the neck, which spread until the fur was filled with the flakes. This scaliness extended to the skin of the ears and extremities. The paws and the base of the tail became red and swollen. As the dermatitis became more severe, the tissues became necrotic, and the animals lost their tail or legs. In a few cases hematuria was observed.

A control group of 16 mice, given the supplemented fat-free diet, into which 10% of lard was incorporated, grew at a faster rate than their experimental litter mates and were

still completely healthy and normal in appearance after 120 days on the diet (Fig. 1).

A third group of 4 animals, kept on the fat-free diet until growth had ceased and the dandruff-like dermatitis had developed, were given the lard-containing diet. Growth was promptly resumed and all the symptoms were completely cured (Fig. 2).

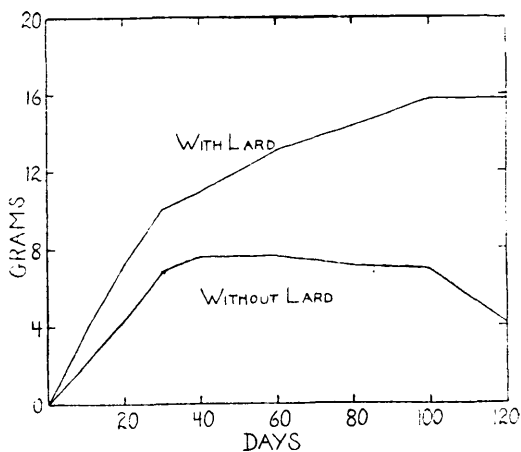


FIG. 1.

Average gains in weight of mice placed at weaning on a diet which was fat-free, and one which contained an added 10% of lard.

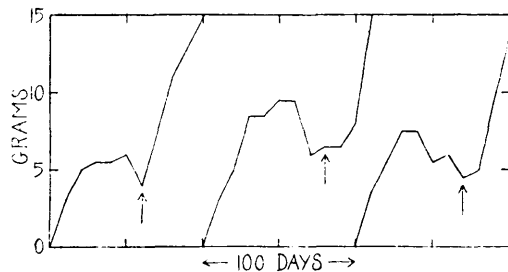


FIG. 2.

Growth response of fat-deficient mice to the addition of 10% of lard to the diet, beginning at the points indicated by the arrows.

Summary. Albino mice kept on a diet devoid of fat developed the Burr and Burr syndrome. The deficiency could be cured or prevented by the administration of lard.