

in upper Georgia. A single individual of a noisy congregation of males had the unmistakable trill of the common toad, but short and decisive like the Fowler's song. It was a perfect combination of the notes of both.

Wherever I have found this toad—in central and southern New England, around Washington, D. C., and in northern Georgia—it has been the only common form. Throughout the region of Jackson and Gwinnett counties of northern Georgia this toad is extremely common. Whether or not its range extends into the central or southern portions of the state, I have not determined. It is evident that *Bufo fowleri* occurs abundantly in much of the territory east of the Appalachian Mountains, and is far from being an uncommon or local race or species.

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A PRELIMINARY NOTE ON A GROUP OF LACTIC ACID
BACTERIA NOT PREVIOUSLY DESCRIBED
IN AMERICA

VARIOUS bacteria forming acid in milk have been described. The organisms most frequently met and which are of the greatest economic importance are those belonging to the group represented by *Streptococcus lacticus* (Kruse) or the *Bact. lactis acidi* of Leichmann. This group is characterized by the small amount of acid which the organisms are able to produce in milk. The milk acted upon by pure cultures rarely shows an acidity exceeding one per cent. The limiting factor is apparently the formation of free lactic acid, the organisms being unable to grow in the presence of free acid. As numerous investigations have shown, the amount of acid produced varies with the composition of the milk. Milks high in casein and ash constituents develop a greater amount of acid under similar conditions than do milks whose casein and ash content is lower, because these substances combine with the acid formed.

Freudenreich, in Switzerland, has described a class of lactic-acid-forming bacteria which are able to produce much greater amounts of acid in milk than the organisms of the

Streptococcus lacticus group. This group of high acid-forming organisms has been brought into prominence recently by the work of Metchnikoff and others on the fermented drink yougurt which is prepared from milk. The organisms found in this type of fermented milk are characterized by the production of large amounts of acid, three per cent. and over, by the high optimum temperature for growth, 42–45° C., by growing only under certain narrow conditions on artificial media, and by their morphology, being large bacilli. In all these the organisms from yougurt agree with those described by Freudenreich.

It has not been thought that such organisms are widely distributed. Indeed some writers have asserted that this type was peculiar to the country to which yougurt is native, Bulgaria. Within the last few months it has been found that organisms whose characteristics are similar to those found by Freudenreich in Swiss cheese and to those found in yougurt are of common occurrence in this country.

If a sample of mixed milk is placed in a tightly stoppered bottle and incubated at 37° C. the acidity rapidly reaches one per cent., due to the growth of *Streptococcus lacticus*. The acidity then continues to increase slowly until at the end of two to three weeks it reaches 2.5 to 3 per cent. The flora at first made up almost wholly of the small diplo-bacilli changes, through the appearance of long slender bacilli, which increase in number with increasing acidity.

In cultural characteristics and in biochemical reactions, the organism isolated is apparently of the same group as those of Freudenreich and the bacteria in yougurt.

As far as the writer is aware, this type has not previously been found in this country, although it is of wide distribution, and has been present for years. Milk bottled in 1902 was recently opened, and showed an acidity of over 3 per cent. A detailed study of the distribution and characteristics of the organism is being made.

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