lot. Genetically they have higher litter-producing powers than the controls; when alcohol is given to them it causes a reduction in the number of their litters, but this reduction is half as great as the reduction caused by the treatment of their parents which were genetically equal to the controls. The alcohol has sorted out differences already present.

This is a very different result from that given by litter size, which demands the assumption of alcohol modifications. It is to be concluded, then, that alcohol works upon the size of litters and the number of litters through different channels. This leads to two generalizations: first, that fertility is a complicated character whose different measures are not all manifestations of the same factors; second, that the action of alcohol upon animals is very complicated; it may act through different channels and in different ways, so that the end results in any special case are due to the interaction of different tendencies. Students of experimental alcoholism must recognize the complex nature of their problem, and, leaving behind the familiar method of generalizing from end results, focus attention upon the problem of the channels through which alcohol may work.

37 (1784)

Experiments with B. enteritidis (murium)[1] on normal and immune mice.

By LESLIE T. WEBSTER.

[*From the Laboratories of the Rockefeller Institute for Medical Research, New York City.*]

These experiments were undertaken to ascertain varieties and degrees of resistance of normal and immune mice to fixed doses of *B. enteritidis (murium)*.

1. If live cultures of this organism are injected intrapleurally or intraperitoneally into normal mice, there occurs an initial lag in the rate of bacterial multiplication lasting a few hours followed by a rapid and continued acceleration of growth until the death of the animal.

If live cultures of this organism are given *per os* to normal mice, there occurs an incubation period of 5–6 days, after which the

[1] A serological and cultural description of this organism will appear in the *Journal of Experimental Medicine.*

animal usually develops symptoms of disease and succumbs. A small percentage of mice, however, prove refractory to infection by this route.

2. If live cultures of this organism are injected intrapleurally or intraperitoneally into mice previously "vaccinated" intrapleurally or intraperitoneally, they are partially destroyed and held in check by the protective mechanisms of the animal body for two or three days. Subsequently, the rate of bacterial multiplication increases gradually until the death of the animal. The partial protection following this type of vaccination is entirely of a general nature; no evidence of a "local immunity" has been obtained.

Mice given 1,2, or 3 subcutaneous doses of this organism vaccine show a similar relative increase in resistance to the subsequent injection of live organisms *per os* as intraperitoneally.

3. Feeding mice live or killed cultures of this organism induces a definite protection against subsequent intrastomachal and intraperitoneal injections of live organisms. The immunity developed in this way is also of a "general" as opposed to a "local" nature.

38 (1785)

Therapeutic application of Bacillus acidophilus.

By LEO F. RETTGER and HARRY A. CHEPLIN.

[*From the Bacteriological Department, Yale University, New Haven, Conn.*]

In previous communications to the Society (1920 and 1921) we stated that *Bacillus acidophilus* may be implanted in the human intestine by the oral administration of (1) minimum quantities of lactose or dextrin, (2) whey broth cultures of *B. acidophilus*, or (3) a combination of lactose and the *acidophilus* culture in which the amounts of each are cut in half. Early in 1921 the milk culture of this aciduric organism was substituted for the lactose- and whey broth cultures and subsequent implantation experiments have been carried on with the *acidophilus* milk.

In the work on pathological cases we received the friendly coöperation of practicing physicians, who not only supplied us with many of the most interesting subjects, but who furnished us