

BACTERIOLOGY¹

Chairman: H. KOFFLER, Purdue University

Edith Haynes, Indiana University Medical Center, was elected chairman for 1951.

ABSTRACTS

Dr. Charles A. Behrens (1885-1950). P. A. TETRAULT, Purdue University, Lafayette.—This paper consists of a memorial to Dr. Behrens.

The effect of nutritional and environmental conditions upon the aerobic and anaerobic glucose metabolism of *Bacillus subtilis* (Marburg). N. D. GARY and R. C. BARD, Indiana University.—The Marburg strain of *Bacillus subtilis* has been recognized as an obligately aerobic organism apparently lacking an anaerobic mechanism of carbohydrate dissimilation. It was found however, that growth in complex media (e. g., tryptone-yeast extract-phosphate-glucose) yielded cells which carried out a lactic fermentation under anaerobic conditions. Cells harvested from simple media (e. g., inorganic N-glucose-phosphate-0.01 per cent yeast extract) were found to have almost no glucolytic activity under anaerobic conditions but engaged in complete glucose oxidation under aerobic conditions. The cells grown in the complex media, however, exhibited only partial oxidation of glucose, the overall oxidative rate also being reduced. The factors necessary for the cultivation of cells capable of engaging in glycolysis include amino acid supplementations to the simple medium as well as the extent of aeration during growth. Addition of the B-vitamins to the growth medium did not enhance glucolytic activity. Thus, under these conditions it appears possible to determine the nutritional requirements for the specific enzymatic reactions involved in glycolysis by this organism, a mechanism as yet undescribed in *Bacillus subtilis*.

The cultivation of bacteria in chick embryos with special reference to *Brucella*. KATHLEEN GAY and S. R. DAMON, Indiana State Board of Health.—A brief history of the involvement of the chick embryo into a valuable medium for the cultivation and study of bacteria is presented. Currently, embryo technics are finding particularly wide-spread application in the study of chemotherapeutic activity and of the pathology and infectivity of bacteria. However, their use in a public health diagnostic laboratory for the primary isolation of bacteria has not developed as rapidly. At the Indiana State Board of Health Laboratories preliminary observations indicated that young embryos might well be used for the recovery of *Brucella* from the blood stream, since it was found that

¹The 1950 program of the Bacteriology Division is dedicated to the memory of Dr. Charles A. Behrens.

when clotted blood containing any one of the three species of *Brucella* was macerated and inoculated via the yolk sacs into 3-5 day embryos, the organisms multiplied rapidly. Subsequently, a method which it is believed can be used with comparable success in any similar laboratory developed and is being evaluated. Fifteen isolations have already been made from clotted blood inoculated into the yolk sacs of embryonating eggs.

Some aspects of fungicidal testing of quaternary ammonium compounds. HELEN M. KETCHUM and L. B. SCHWEIGER, Miles Research Laboratories, Elkhart.—A review of the literature on fungicidal tests reveals the fact that few tests are applicable for testing a fungicide under practical conditions for use. This is especially true with fungicides containing quaternary ammonium compounds.

Various methods and modifications are described. The difficulties of fungicidal testing are discussed with particular reference to the activity of formulae containing quaternary ammonium compounds on dermatophytes. A modification of the Burlingame-Reddish technic in our hands gave the most satisfactory results for routine testing and evaluating this type of fungicide.

Production and assay of experimental rabies antiserum. H. M. POWELL and C. G. CULBERTSON, Lilly Research Laboratories, Indianapolis.—In the March 24, 1950, issue of Public Health Reports we have shown that fixed rabies virus can be propagated fairly successfully in substantial titer in embryonated duck eggs.

Using duck embryo rabies virus as an antigen, we have prepared about eight liters of immune serum in rabbits. We have administered this antigen at first intravenously and later in the course of immunization by intraperitoneal injections. Rabbits are kept on a schedule of immunization and bleeding as long as possible instead of being sacrificed early.

The antiserum obtained has a virus neutralization index of 5 or 6. Concentrated serum has a higher titer which can best be measured by testing various dilutions of serum against a constant dilution of virus rather than by the index method.

Rabies antiserum prepared in this way has substantial therapeutic action against rabies street virus.