

and diagnosis of disease. The question, therefore, is, given a low opsonic index in the course of a chronic bacterial infection, how can we raise that index and relieve or cure our patient? Wright provided the solution of this problem and gave us bacterial vaccines.

By a bacterial vaccine is meant "bacteria or their products." In actual practice we use bacteria grown in culture-tubes and then devitalized. The principle involved in therapeutic inoculation is that a vaccine, consisting of devitalized bacteria of the same strain as that responsible for the patient's infection, should be administered by subcutaneous injection in correct doses at appropriate times. It is in this connection that the measurement of the opsonic power of the blood aids us, and, without elaborating the argument, permit me to state as my belief that the study of the opsonic power of a patient's blood does enable us to judge the proper dose of a vaccine and the appropriate time for inoculation and reinoculation.

The principle of bacterial vaccination may be brought home to our minds by an example or two. If we have to treat a patient with boils due to infection by the *Staphylococcus pyogenes*, we will grow the staphylococcus, kill it and inoculate our patient with a proper dose of this dead culture. If our patient has tuberculous glands, we will inoculate him with new tuberculin (Bacilli emulsion), which consists of devitalized tubercle bacilli. The principle holds similarly for all bacteria that we can grow.

With this very brief summary of the basic principles, I propose to deal with a few of the results already achieved with these newly forged instruments of therapy. But first let me refer to a practical, though tentative, classification of bacterial disease that four years' investigation of the opsonic index in many hundreds of cases has elicited.

CLASSIFICATION.

Class 1.—This comprises mostly *chronic infections* in which it has been determined that a low opsonic index is persistent. The lowered opsonic index is thought to be due to the absence of "auto-inoculation" (Fig. 1). By autoinoculation is meant the escape of bacteria or their products from the focus of disease into adjacent lymph or blood streams. The result of such an escape is to increase the opsonins and other bacteriotropic substances in the blood by stimulation of the machinery of immunization and often to cure or relieve the infective process. The absence, therefore, of autoinoculation determines the persistence of the infection and indicates the necessity of interference with bacterial vaccines by means of inoculation. In this great class where autoinoculation is slight or absent there are included many tuberculous affections, such as tuberculous disease of glands, bones and early, or moderately early, pulmonary tuberculosis. We find here also boils,