

and an equal portion of the serum of a *normal* individual. These are mixed together and incubated fifteen minutes. A smear of the first incubated mixture is then taken and examined under the microscope; stained, and the number of staphylococci in each of fifty or more white corpuscles are counted. Suppose there be found 250—that is 5 germs in each blood corpuscle. A similar procedure is taken with the second incubated mixture, which contains the *normal* serum. In this case the number of germs in the 50 corpuscles will be, say, 500—that is, 10 germs ingested by each white corpuscle. From these two experiments the investigator concludes that the patient's power of battling with these particular micro-organisms is only one-half of what it should be, and decides, to say in inoculation parlance, that the patient's opsonic index is one-half or .5. This index is taken from time to time during the course of treatment, and is an indication of the progress the patient is making.

TREATMENT.

The treatment of these bacterial diseases, whether due to the staphylococcus, streptococcus, gonococcus, the tubercle bacillus or some other micro-organism, consists in making a vaccine of the organism which has caused the disease. The technique of this I will not describe, but will simply say that the vaccine is made up of devitalized (dead) micro-organisms suspended in the form of an emulsion in salt solution. To see that the vaccine is perfectly safe to administer, some of it is put in a suitable medium, and if there are no signs of growth we may conclude that it is safe to inoculate the patient. To make assurance doubly-sure, a guinea pig may be inoculated with the vaccine; if he survive the vaccine may be pronounced safe to administer to the patient.

A certain measured dose of a standardized emulsion is given—that is to say, an approximate number of dead micro-organisms are injected hypodermically into the system, say 2,000,000 to 200,000,000, depending on circumstances. The number of these in any given emulsion may be counted by means of making a comparative count of the number of these micro-organisms which are found in association with a certain number of counted red blood corpuscles present in a cubic millimetre.

As a rule, immediately following the injection, the patient's opsonic index becomes lowered, but, succeeding this negative phase, the index steadily rises, passes its old mark and exceeds the opsonic index of the normal individual. This upward movement is termed the positive * phase. Subsequent to this, from

*Chart shown.