

in the body, and what is the respective modes of action of these? To explain the terms just alluded to: When the blood of one animal, say a rat, is injected into the blood of another animal, say a sheep, it not infrequently happens that the red blood-corpuscles of the rat become disintegrated, and their hæmoglobin is liberated—a process termed “laking of blood.” This is said to be due to the presence in the blood of the inoculated animal—the sheep in this case—of a certain specific substance. This substance is named hæmolysin. The term bacteriolysin is applied to that substance which has a similar, deleterious action on living bacteria.

Also, it has been observed that if typhoid bacilli, for example, enter the blood-stream, they stimulate the body-cells to produce Agglutinins. These agglutinins exert a negative chemiotaxis on the bacteria. As a result, the bacteria assemble in clumps, and, accordingly (as some observers affirm), their spread in the system is to a certain extent limited. Agglutinins are always specific. This feature of Agglutination forms the essence of Widal's Test for typhoid fever. I shall not discuss the nature of Precipitins, etc., as these have no direct bearing on Immunisation (in its practical application.)

Perhaps the most widely accepted theory with regard to the formation of these anti-bodies and their characteristics, is Ehrlich's Side-Chain Theory. Every text-book on Bacteriology contains a detailed delineation of this universally accepted explanation. So that it would be redundant on my part to tax the reader's patience with an unnecessary rehearsal.

The second kind of Artificial Immunity is Passive Immunity. Passive Immunity is of a more artificial character than Active Immunity. This sounds pleonastic. But, I mean that whereas in Active Immunity something is injected into the circulation and this something induces a reaction of the body-cells in *manufacturing* the anti-bodies, on the other hand, in Passive Immunity another kind of substance is introduced. This substance is *in itself* the anti-substance; and neither does it require nor does it stimulate, the body-cells to produce anti-bodies. It is for this reason that Passive Immunity is *never* permanent (indeed it often does not last long) whilst Active Immunity may last long or may be permanent.

Passive Immunity is produced—

By the injection of an Anti-toxic Serum. This is obtained from the blood of an animal that has been “actively” immunised (against that specific infection) by the inoculation of gradually increasing doses of the specific toxin.