

The next discovery was the startling one made by Wassermann in 1906, that the cerebro-spinal fluid in general paralysis contained substances which, when combined with the syphilitic virus, have the power of inhibiting haemolysis. It will be remembered that in 1900 Bordet demonstrated that in various processes, of which haemolysis may be taken as a type, three bodies are essential components. These are, first, the antigen, or substance that is being destroyed—bacterium, blood cell, etc., as the case may be; secondly, a non-specific substance, or complement, found in all blood serums; and, thirdly, a specific substance, or amboceptor, found only in the serum of an individual that has been previously injected with the corresponding antigen—the amboceptor being thus evoked as a response to the foreign body. It follows that if two of these three bodies are present in a fluid and cytotoxicity does not take place, it must be due to the absence of the third; thus, if the antigen is not dissolved on being added to its corresponding amboceptor, the complement must be missing. In this way we can test for the presence or absence of complement. Now Wassermann found that syphilitic virus obtained from a foetal liver in which spirochaetes had been demonstrated, when in the presence of the cerebro-spinal fluid of a paralytic, made a combination with it, and the complement present in any blood serum. This complement was thus taken up or fixed and was no longer free to cause haemolysis when added to red blood cells and haemolysin in the way just mentioned. For this test he first incubates for an hour the syphilitic liver emulsion with the suspected cerebro-spinal fluid and the complement-containing serum of a guinea-pig; he then adds the mixture to an emulsion of washed red blood corpuscles of a sheep and some serum of a rabbit that has been several times injected with sheep's blood. If the blood cells dissolve—that is, if haemolysis or laking takes place—then the complement must have been free to do it, and could not have been fixed by the preliminary incubation. Wassermann maintains that this is due to the absence of any syphilitic anti-body or amboceptor in the cerebro-