

serum containing a large number of blood corpuscles. The result of his investigations with regard to hemolysis are identical with those of Bordet. Ehrlich points out that, with regard to furnishing an explanation of the process of hemolysis, one is compelled to accept, according to Pfeiffer's explanation of the process of bacteriolysis, the existence of two substances. A specific active and stable substance to which he applies after Pfeiffer the term "immune-body" (Immun-körper) and a substance, present in the normal animal, which Ehrlich preliminarily chooses to call "addiment." By the injection of an animal of a certain species with defibrinated blood of another animal, an "immune-body" forms in an analagous manner as antitoxins and bactericidal antibodies are formed. This immune-body possesses two different haptophorous atom complexes; one atom complex which has a great affinity for the corresponding haptophorous group of atoms of the red blood corpuscles, and a second haptophorous group of atoms of less chemical energy, which is capable of more or less completely attaching to itself the "addiment" contained in the blood serum. This theory corresponds with Ehrlich's* "side-chain theory," which furnishes the most plausible explanation of the formation of antitoxins and bactericidal antibodies. The experiments which Ehrlich and Morgenroth describe in the above-cited article certainly justify the acceptance of Ehrlich's side-chain theory in an equal degree, as it has been accepted for the formation of antitoxins and antibodies in general. For the sake of brevity, we have omitted a description of these experiments. If, according to Ehrlich's theory, any body, be it a toxin or a toxoid, a ferment, or a part of a bacterium or of an erythrocyte—if any such body possesses the capacity to unite with the side chains of protoplasm, the conditions are fulfilled for the formation of the respective antibody. According to this theory, the molecule of any one of these antibodies must possess that group of atoms which unites with the haptophorous (*i. e.*, the specifically binding) group of atoms of the original body, *i. e.*, the toxin, toxoid ferment, bacterium, or erythrocyte. The soluble substance, therefore, which is produced by the action of the original body (by the toxin, bacterium, erythrocyte, etc.), must chemically combine with the original body. If the original body is a soluble substance from the beginning, as the toxins, this "neutralization" takes place in the solution. If, on the other hand, the original body is not directly soluble but consists originally of an insoluble substance, for instance, of a particle

* Ehrlich understands by side chains (Seitenketten) lateral groups of atoms in the molecule.