

some time by the germs, and that the resultant immunity is due to the absence of food for these micro-organisms. In other words, one possesses natural immunity, when his body does not harbor such substances as are of nutritive value to that specific bacillus. In contradiction to this theory is the fact that we use blood-serum, as being the best medium for the development of cultures of most pathogenic organisms. Still more, for the purpose of producing *artificial* immunity (which, as will later on be explained, is similar in character to natural immunity) we inoculate into a susceptible, the serum of an immune animal. This means that simply the absence of food-material (for the bacteria) in the serum employed is not sufficient to cause immunity.

The Retention Theory—promulgated by Chauveau and Wernich—claims that, during their growth, bacteria produce certain substances which are inimical to their own development. Of some bacteria this is certainly true, when the culture is in an artificial medium, and in a test-tube; or, it occurs in the body, sometimes, when that part in which the bacteria have ensconced themselves, is cut off from communication with the rest of the body, that is, when the “auto-toxic” (to coin a word) products of the organisms remain centred around the latter. But, these men claim that, *a priori* the animal is rendered immune, even after the disease has disappeared. However, the fact that immunity to a certain disorder may exist for a very long time, and, in fact, be transmitted to off-spring disproves such an extreme view as is supported by this theory.

Still another theory—that held by Buchner and Wolffberg—regards an immune animal as possessing only those cell-elements which are strong enough to eliminate the germs and poisons of the infection. For example, in an individual attacked by small-pox, the weaker cell-elements would be gradually destroyed, and only the stronger ones (i.e., those able to cope with the germs) remain. However, even this theory fails to conform absolutely with the results of numerous investigations.

Modern teaching, however, upholds the Phagocytosis Theory of Metschnikoff as explaining the signification of natural immunity (with which Behring's name is connected). As stated earlier in this paper, dearth of space hinders a complete exposition of these two theories against infections. Another school supports the humoral theory (which, however, are efficiently taken up in most of the modern text-books on Pathology). Suffice it to state that the Phagocytosis Theory has for its basis the fact that leucocytes ingest (and thus destroy) bacteria. On the other hand, the Humoral Theory holds that bacteria are killed by certain bactericidal substances present in the fluids of the body (and not in the leucocytes).