THE THEORIES OF IMMUNITY—FROM THE THERAPEUTIC GAZETTE.

AT the recent meeting of the International Congress of Hygiene and Demography, Dr. Metchnikoff, of the Pasteur Institute, re-stated and reaffirmed his views as to the bactericidal power of his phagocytes, — *i. e.*, the leucocytes of the blood (certain white blood corpuscles or cells.) Since the phagocyte theory has been propounded, it has given rise to numerous objections, based on theoretical considerations, as well as on research and experiment; but the more we go into the question, the more it becomes evident that the army of the phagocyte cells is in reality a salutary power which is formed in the struggle of the animal organism for existence. At one time the phagocytes act alone, at another they combine with other factors which facilitate their efficiency. But in all these cases we see these cells combating the parasites. When the phagocytes are inactive, this is a sign either of the harmlessness of the microbe, or, on the contrary, of its extraordinary virulence. Dr. Metchnikoff instanced the case of remittent fever, in which it is known that the spirilla are destroyed by the phagocytes during the crisis and the period of apyrexia. In monkeys, where the spirilla are destroyed by the cells, the illness terminates with the first attack; but in man, where the phagocytes have generally not been able completely to destroy the spirilla, a second attack is produced, in spite of the formation of antitoxine. This is the same in intermittent fever. It is evident that it is only when the microbe is entirely destroyed that the organism can be considered free from it. Therefore, in this act of destruction of the microbes, it is the phagocytes which perform the most important *role*, as has been proved in the case of anthrax and in numerous other diseases, and in the case of the vibrio of septicæmia in guinea-pigs.

The question as to the bactericidal power of blood-serum was regarded as complicated and as needing fuller inquiry.

Behring, the founder of the blood-toxic theory, has himself acknowledged that this theory cannot be easily applied, except in diseases like tetanus and diphtheria, which are distinguished by their exceptionally toxic characters and by the absence of diffusion of microbes. As was proved by Vaillart and Vincent in regard to tetanus, the animals which are subject to malady are naturally refractory to the microbe, and in this immunity from the microbe, it is the phagocytes which play the principal part.

Dr. Adami said that the bacteriological world was at the present moment divided into two bitterly-opposed camps,—those who held that microbes within the system were destroyed by the agency of the living cells, and those who held that the function of microbic destruction was performed by the blood-serum and body fluid in general. He wished to especially emphasize the fact that we had ample evidence to show that controversy upon the subject turns after all upon phenomena which differ not so much in kind as in degree. The controversy tended rather to be words than actualities, and if we directed our observations aright, it would be impossible not to be struck by the prevalence of phagocytosis. He was of opinion that those who were not in the thick of the fray must continually accept both views, and would point out that this position was far from being untenable. He said that he need hardly mention that it was especially around the phenomena observed in the rat that this controversy had raged, that in the rat phagocytosis could be with difficulty observed, and the rat's blood-serum possessed bacteria-killing properties to a high degree.

In the opening paper, read before the Bacteriological Section on the 12th ult., Dr. Roux, of the Pasteur Institute, said that the theory of immunity proposed by Metchnikoff does not deny that there may be other means of protecting the organism, but it affirms that the phagocytic action is of all these means the most efficacious and extensive. It seems to account for all the facts and to be eminently suggestive; it is thus that the knowledge of microbic poisons and chemical inoculation has thrown light on what would otherwise have been obscure. Far from being shaken by the theories that were opposed to it, this theory of Metchnikoff had gained by the opposition which it had met, and that was a guarantee of its genuineness.