

A NEW DISCOVERY IN MEDICAL SCIENCE THE OPSONIC THEORY

AT the opening of the present term of the medical faculty of the University of Toronto, an address of great interest to the members of the medical profession was delivered by Sir Almroth Edward Wright, of St. Mary's Hospital, London, England. In this address Dr. Wright described in more or less detail the nature of some discoveries which he had recently made, and explained what he has been pleased to term the "opsonic theory."

It has long been known that the blood while in the body has the power of resisting to a certain degree the disease producing action of germs, in spite of the fact that when it is removed from the body it proves to be a good medium for their growth. This resisting power possessed by the blood was believed to be due to the ability of the white corpuscles of the blood to pick up, kill and digest the invading microbes.

Dr. Wright found, however, after numerous experiments that when bacteria and the white corpuscles of the blood were mixed, the white blood corpuscles had no power of digesting the bacteria. When, however, the serum or fluid of the blood was added to the mixture of white blood corpuscles and bacteria the process of digestion went on. He inferred, therefore, that there was some resisting influence in the serum or fluid of the blood which altered the bacteria so as to make them palatable for the white blood corpuscles. This resisting influence of the fluid of the blood Dr. Wright was pleased to call "opsonin." It was further found, however, that, in the case of a patient afflicted with bacterial disease, the blood serum was much less active in preparing bacteria for digestion by the white blood corpuscles than was the blood serum of a person in health. And by an ingenious technique Dr. Wright has made it possible to estimate the activity of any particular blood serum. As a result of this the activity of the serum of a person suffering from a bacterial disease, as compared with the activity of a normal serum, came to be called by him the "opsonic index."

It then suggested itself to Dr. Wright that it might be possible to devise some means

whereby the resisting activity of the blood serum might be increased. In the solution of this problem the principle of vaccine was employed. Cultures of the infecting bacteria were made and devitalized at a comparatively low temperature, so low that, though their life was rendered extinct, the chemical constituents of their protoplasm was not materially altered. With this vaccine patients suffering from bacterial disease were inoculated, and it was found that the "opsonic index" was in a few days considerably increased, or in other words that the



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injection of the vaccine promoted the formation of some chemical compound in the blood serum, and this compound or "opsonin" had the power of preparing the invading microbes for digestion by the white blood corpuscles.

The importance of these observations is clearly seen. In the treatment of bacterial diseases definite lines are to be followed in each case. First, the specific germ which causes the disease must be determined. Second, the patient's "opsonic index" must