

**FISKE FUND PRIZE  
DESSERTATION NO. LIV;  
VACCINE-THERAPY**

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Fiske Fund Prize Dessertation No. LIV; Vaccine-therapy by William G. Dwinell

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**WILLIAM G. DWINELL**

**FISKE FUND PRIZE  
DESSERTATION NO. LIV;  
VACCINE-THERAPY**



FISKE FUND PRIZE DISSERTATION. No. LIV.

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# VACCINE-THERAPY.

MOTTO:

"Vis Medicatrix Naturae."

BY

WILLIAM G. DWINELL, M. D.,

PAWTUCKET, R. I.

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1911.

THE Trustees of the Fiske Fund, at the annual meeting of the Rhode Island Medical Society, held at Providence, June 1, 1911, announced that they had awarded a premium of two hundred dollars to an essay on "Vaccine-Therapy," bearing the motto:

"Vis Medicatrix Naturae."

The author was found to be WILLIAM G. DWINELL, M. D., of Pawtucket, R. I.

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## FOREWORD.

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"Contention that, in connexion with every cure which is credited to vaccine-therapy, the possibility of that cure having taken place spontaneously should be taken into consideration, appears at first sight to be a perfectly reasonable contention. When I urge upon you that the *vis medicatrix naturae* comes insistently to the aid of the physician, even where he ignorantly opposes it, and when I ask you to reflect that among all the therapeutic methods which have been practised there is probably not one—be that method never so harmful—which is not credited with many cures, you will perhaps realize that I can have no possible quarrel with the critic who demands that it shall be demonstrated to him, in connexion with the cures which are ascribed to vaccine-therapy, that they are not to be credited to the spontaneous operations of nature.

The critic who makes this demand from me may therefore be assured that he is forcing an already open door. When he contends that spontaneous cures of bacterial disease do occur, he is only emphasizing one of the fundamental axioms upon which the immunisator builds. For if it were not for the fact that spontaneous cures do occur, and for the fact that there follows upon these in many cases a condition of insusceptibility to further infection, the immunisator would have no warranty for expecting anything either from prophylactic or therapeutic inoculations. In other words, were it not that nature is competent to bring about these results under the stimulus of auto-inoculation, assuredly all attempts to bring them about by artificial inoculations would be vain."—WRIGHT.



## VACCINE-THERAPY.

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As the prophylaxis and cure of disease are among the most important of those questions which are engrossing the attention of humanity it is natural that very great attention should have been devoted to it from the most remote time. We see primitive races, the ordinary layman, medical men, legislators and even the most subtle thinkers devoting their energies to the solution of the problem of immunity against poisoning, and against infections. Historical science will never reveal to us the earliest sources of our knowledge on this question, so remote are their origins. The wide distribution of several methods for protecting man and cattle against certain diseases clearly proves that the origin of this practice dates from a very early period. The Chinese assert that they have been familiar with the principles dealing with immunization against smallpox since the beginning of the 11th century. According to the account of Timioni, a Greek physician practising in Constantinople in the first half of the 18th century, the Circassians and Georgians, intent upon preserving the beauty of their daughters, made punctures at various points in the skin with needles charged with variolus virus. In 1798 after

twenty years of work Jenner published his first account on the utility of vaccination with virus of cowpox. In 1880 Pasteur prepared two vaccines for prophylactic use, one against anthrax, and one against swine erysipelas. In light of recent knowledge Pasteur's immunity theories were crude but they served a purpose, and attracted the attention of many scientific thinkers. As far back as 1858 Haeckel had observed that particles of indigo injected into the veins of certain molluscs could shortly afterwards be found in the cells of the animal. The significance of this and other observations was not appreciated until Metchnikoff in 1883 called attention to their bearing on infection and immunity. The outcome of his investigations was the establishment of the well known doctrine of phagocytosis.

Metchnikoff believes that susceptibility to or immunity from infection is essentially a matter between the invading bacteria on the one hand, and the leucocytes on the other. He realizes that the serum constituents play an important role, but this role consists in their stimulating the leucocyte to take up the bacteria.

In 1895 Denys and Leclef called attention to the action of blood serum on phagocytosis and they produced reliable experimental evidence that there were present in the blood serum of immunized rabbits substances which alter microbes in such a way as to per-

mit of their ingestion by leucocytes. In 1897 Bordet was unable to confirm their results. Munnes however in the same year demonstrated that the immunity of guinea-pigs inoculated with cultures of pneumococci depends on a modification of their serum whereby an active phagocytosis is induced, and that this was not due to any especial activity of the leucocytes. In 1902 Leishman devised a method of quantitatively estimating the phagocytic power of blood to staphylococci. In 1903 Wright and Douglas introduced the word opsonin (opsono, I prepare the food for) to characterize the substance in normal blood which they believed prepared the microbes for ingestion by the leucocytes. In 1904, Neufeld and Rimpau independently of Wright alluded to the two well known elements in immune serum (i. e. antitoxins and bacteriocidal substances) and stated that they had found a third element which they claimed sensitized the bacteria but did not act on the leucocytes. To Wright and Douglas belong the distinction of making the necessary clinical application of these discoveries which has resulted in the opsonic or vaccine treatment of disease.

**OPSONIN.** Inasmuch as the foundation of Vaccine Therapy rests upon the action of opsonin it might be well to consider the properties ascribed to this substance. Its existence as a distinct antibody has been fully proven by Hektoen, Rudiger and others in this country, by Wright and Douglas in England and by