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## Effect of a Stimulating Dose of Pertussis Vaccine on Children Previously Immunized.

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During the course of study on the agglutinin response to pertussis vaccination in a group of Chinese children, it was noted that in every case the agglutinin titer of the blood sooner or later reached its height and then began to decline. This observation aroused our interest to try out the effect of a stimulating dose of the pertussis vaccine on the titer of the specific agglutinin, particularly in view of the successful results of restimulation in the case of active immunization against typhoid,<sup>1</sup> diphtheria and tetanus.<sup>2</sup> Five infants varying from 9 months to a little over one year of age in whom a negative history of pertussis infection in the past is reasonably sure were chosen as subjects for study. The first 2 infants were vaccinated according to the procedure recommended by Sauer;<sup>3</sup> namely, bilateral injections of 1 cc each into the deltoid muscles on the first occasion followed by similar injections of 1.5 cc each one and 2 weeks later respectively. To the third infant, similar doses were given with the intervals between successive injections lengthened to 3 weeks. The fourth and fifth infants differed from the third one in that they failed to come back for the third dose of vaccine. The vaccines used were prepared from cultures of the strains of *H. pertussis* isolated from our own patients not longer than 4 months previously and kept virulent by frequent transfers on the Bordet Gengou medium plus 20% fresh, defibrinated human blood. They were standardized by turbidity method to contain approximately 10 billions of organisms per cc. Blood samples were tested at frequent intervals for the presence of specific agglutinins by means of the rapid agglutination technic advocated by Kendrick.<sup>4</sup>

The blood of these 5 infants taken just before vaccination gave a uniformly negative result to the agglutination test. The specific agglutinin began to appear in the blood shortly after the second or

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<sup>1</sup> Topley, W. W. C., and Wilson, G. S., *The Principles of Bacteriology and Immunity*, 2nd Ed., page 873.

<sup>2</sup> Jones, F. G., and Moss, J. M., *J. Immunol.*, 1937, **33**, 173, 183.

<sup>3</sup> Sauer, L. W., *J. A. M. A.*, 1932, **100**, 239.

<sup>4</sup> Kendrick, P. L., *Am. J. Pub. Health*, 1933, **23**, 1910.



third dose of the initial course of vaccination. There was, however, a rather wide variation in the agglutination titer for the individual cases. The titers were the same regardless of whether vaccines or living suspensions prepared from the homologous or heterogeneous strains of the organisms were used as agglutinin, provided their concentrations were the same.

After an interval of from 4 to 19 weeks after the first course of prophylactic inoculations, when the agglutinin titer of the blood had declined considerably, bilateral injections of 1.5 cc of vaccine each were given in the deltoid regions of all the 5 infants. The results shown in Table I indicate that these injections were invariably followed by a very marked increase of agglutinin within one week far above the immediate response to the initial vaccination. After another interval of from 15 to 28 weeks, the effect of such a stimulating dose was tried for the second time with more or less similar results. Although we are aware of the fact that agglutinins do not necessarily represent immunity, this observation suggests that if a stimulating dose of pertussis vaccine is given to an already vaccinated child shortly after exposure to infection, it may increase the amount of antibody during the incubation period of the disease so as to enhance the chance of protection.

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### A Dialyzable Component of Complement.

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When serum of a normal guinea pig is dialyzed against a normal saline solution with a cellophane tube\* the hemolytic activity of the solution decreases rapidly. A prolonged dialysis will destroy almost all of the original activity. We have now found that this loss of activity is due to the loss of one of the components of complement which passes through the membrane into the saline solution, and that the original activity may be almost completely restored by the addition of the dialyzable to the non-dialyzable fraction.

A typical experiment of the dialysis is as follows: 10 cc of fresh guinea pig serum containing 80 units of complement per cc were

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\* Obtainable from DuPont Cellophane Co.