case of measles by Drs. Duval and Hibbard. Macroscopic agglutination tests were performed for all 5 of the above organisms before injection, and again 10 days after the last dose of vaccine.

A glance at the parallel agglutination tests gave the impression that there was absolutely no relation between the ability to produce typhoid agglutinins and staphylococcus agglutinins, the latter being of course entirely unrelated to the typhoid bacillus. The impression was confirmed by the correlation coefficient ($-.00031 \pm .101$). On the other hand there appeared to be a high degree of relation between the ability to produce typhoid and *B. paratyphosus A* agglutinins, which are related antigens. This was likewise confirmed by the correlation coefficient ($+.302 \pm .091$). Unfortunately the *B. paratyphosus B* and the measles coccus were poor antigens, failing to stimulate a sufficient amount of agglutinins from which to draw conclusions.

These observations would seem to indicate that the response of an individual to an antigen depends not so much upon a sensitive immunity mechanism in general as to the sensitivity of the individual to the particular antigen.

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The Antibody Response to Injection with Typhoid Vaccine.

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Incidental to the investigation of another problem opportunity was afforded to check the results reported in a previous study upon the significance of the antibodies produced by typhoid vaccine.[1, 2, 3] Forty five students were injected with typhoid vaccine. Agglutination reactions were performed before the injection, and again 10 days after the third dose of vaccine. The results were analysed in the same manner as in the previous study.

It was quite upsetting to note that in this case those who had not had previous vaccine responded by a marked agglutinin production (1/300) instead of a low average (1/66) as before, completely reversing one of the conclusions drawn in the former work. On the other hand, those who had had typhoid fever responded in

[1] Feemster, Roy F., PROC. SOC. EXP. BIOL. AND MED., 1930, **27**, 636.

[2] Feemster, Roy F., PROC. SOC. EXP. BIOL. AND MED., 1930, **27**, 911.

[3] Feemster, Roy F., to be published in an early number of the *J. Infect. Dis.*

about the same manner this time (1/288) as before (1/285). Likewise those who had had previous typhoid vaccine produced agglutinins in comparable titers in this series (1/113) as in the previous group (1/162).

It is interesting to note, however, that when the 2 groups are combined, so that we have a total of 135 individuals instead of 45, the averages again return to the relation found in the first experiment, those who had had typhoid fever averaging 1/287, those who had had previous typhoid vaccine 1/143, and those who had had neither 1/115. The reversal of the average in the one group in the second experiment was produced by the high agglutinin titers of 4 students. There were individuals with just as high titers in the previous study, but chance happened to throw 4 such students into a small group of 9 in the latter instance and there were only 4 with titers as high in a group of 34 in the first experiment. No doubt if there were any way of proving it, we would find that these individuals belong in the group of so-called natural immunes occurring in the population in general.

Practically all of the other conclusions drawn in the study made previously are confirmed by this second series of observations, and the figures will not be repeated here.

This reversal of averages in a small series emphasizes the danger of drawing conclusions from too few observations. If the second experiment had been the only one performed the author would no doubt have published a note including a conclusion which has been drawn by others from similar small series of observations, but which appears to be the reverse of the actual facts.

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Some Effects of the Vitamin B Complex on Appetite and on Utilization of Food.

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The relation of the vitamin B complex to the rate of growth, to the consumption of food and water and to the utilization of food in rats has been studied. The Evans and Burr diet (purified casein—25, sucrose—75, salt mixture—4) was used and was sup-