

It is evident, therefore, that the glass-method is superior to the Endo-plate method in diagnosing para-typhoid and Gärtner cases while it is inferior in diagnosing typhoid cases. The advantages of the glass-method are its simplicity, rapid results and greater accuracy in detecting para-typhoid and Gärtner cases.

**Ricerche sperimentali sulla vaccinazione anti-paratifica per via orale.**

PROF. DR. GIORGETTO NEGRO (*Turin*). Read by title.

L'Autore ha studiato l'azione profilattica e terapeutica di vaccini costituiti da lisati alcalini di stipiti di *Salmonella paratyphi* A e di *Salmonella schottmülleri* somministrati per via orale. In base ai risultati ottenuti l'Autore conclude sull'efficacia di tali vaccini.

**Variations of *B. coli* in Relation with Bacterial Inhibitory Agents.** PROF.

DR. ANDRÉ GRATIA (*Liège*).

Most of the variations of a strain of *B. coli* (no. 6 of our collection) we have observed in relation with bacteriophage since 1921, proved to be not actively adapted organisms but passively selected preexisting forms.

In 1926, we found another inhibiting agent for the same strain of *B. coli* 6 which was secreted by an antagonistic strain, *B. coli* 7. Although it could have been mistaken for phage, this inhibiting agent is entirely different. As is the case for phage, when this agent is poured on an agar culture of *B. coli* 6, no growth occurs with the exception of a few resistant colonies.

One of our assistants, Mrs. Demelenne Jaminon, has recently resumed this study with the following results:

Two types of resistant colonies were found: the first ones grow normally and have the same appearance as the original sensitive colonies; the second are strikingly different as they do not show well before 48 hours and remain extremely small even after numerous transplantations on plain broth or plain agar during one year. While the first colonies consist most likely of passively selected preexisting germs, the second ones might represent organisms intermediate between sensitive and resistant ones. On the verge of destruction, they have just been able to survive and acclimatize themselves to the inhibiting agent. They seem to grow better in the presence of the latter than on plain agar and have never been found in the original culture. It is true, though, that in order to get one chance of finding one of them it would be necessary to plate 4000 Petri dishes each containing 100 normal colonies, an experiment beyond our technical possibilities.

As these two resistant variations were obtained without the use of phage,

d'Herelle's recent claim according to which all variations are bacteria living in symbiosis with phage can only be an occasional occurrence. We have found only one such instance, with a *B. megatherium*; and yet in this case symbiosis might be more likely the result than the cause of the variation.

*Discussion by DR. FRITZ SCHIFF (New York):*

The finding of eight *Salmonella* types, hitherto not recovered from human beings in this country, is reported. Among them is a new type, *S. wichita*, which combines the O-antigen of *S. worthington* with a specific flagellar antigen related to the d-antigen of *S. typhi* (isolated by B. McKinlay in 1935 in Kansas). Other types found are *S. amersfoort* (first occurrence in man), *S. chester*, *S. oranienburg*, *S. muenchen*, *S. morbificans bovis*, *S. thompson*, *S. panama*. The last mentioned is culturally different from the original panama strain. The New York variety was found in 1936, 1937, 1938, and 1939 and was further identified among stock cultures of 1930.

Systematic investigations throughout the country are desirable. The *Salmonella* Centre established in New York City—Beth Israel Hospital, Department of Bacteriology—is now in a position to undertake the investigation of doubtful cultures, chiefly of human origin.