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INFLUENZA

IN the issues of August and this month appear three papers by a team of workers from the Connaught Laboratories, University of Toronto, assisted by physicians in other centres and medical officers attached to Camp Borden Military Hospital. The first paper, published in August, dealt with the serological response of volunteers to a concentrated vaccine made by a method developed in the Connaught Laboratories. There is evidence that the response is at least as good as that during a clinical infection.

This vaccine was made with influenza A virus, and volunteers were immunized in Toronto, Winnipeg, Edmonton, and Vancouver during the months of November and December 1942 and January 1943. An approximately equal number of controls were "immunized" with saline. It was expected that an epidemic of influenza A would make its appearance during the first quarter of 1943 because this variety seems to appear in two-year cycles, the last visitation being late in 1940. A mild epidemic duly made its appearance but its symptomatology was unlike that of influenza A and serological study of the cases showed that about 19 per cent of the cases were probably influenza B. These diagnoses are based on a serological method in which comparison is made between the serum taken during the acute phase of the infection and convalescent serum.

It is true that the actual isolation of the virus from each case should be the logical method of establishing a diagnosis, but the fact that isolation of a virus is at any time surrounded by its own peculiar perils and that influenza B is in this respect even more than usually troublesome, precludes this as a routine method of establishing the diagnosis. For this reason the practice has grown, in recent years, of making a diagnosis on the basis of an increase in the antibody level of the serum during the illness. If the titre increases four times or more, the infection is considered to have been due to the particular virus, influenza A or B, used for the tests. If the titre does not rise to this amount, the assumption is made that these viruses have not been implicated and the infection is considered to have been of unknown aetiology or, as some authors express it, "influenza Y".

While it is possible to accept a positive result by this method without very much hesitation, a negative result is subject to several interpretations. It is

possible, for instance, that an infection may have occurred but the rise in antibody level was smaller than the fourfold required; that the wrong type, although the right species, of virus was used for the tests; or simply that another aetiological agent was responsible. There has been a tendency to accept the last of these alternatives and to designate the cases "influenza Y".

Following this reasoning, all the recent epidemics have been "mixed". In 1938-39 and 1940-41, for instance, influenza A and "influenza Y" were the causative agents, and although the proportions varied somewhat in different centres, the majority of the cases were due to influenza A. Substantially the same thing occurred in 1943, influenza B and "influenza Y" being the responsible agents. But in this instance the majority of the cases were "influenza Y".

It must, however, be pointed out that these epidemics are extremely widespread. The epidemics of 1938-39 and 1940-41, for instance, extended over large areas of both Europe and North America. That of 1943 certainly infected large areas of North America, insufficient data being as yet available from Europe. And it is a striking fact that, in centre after centre, about the same proportion of the total cases were influenza A or B and "influenza Y". It is, however, extremely difficult to conceive an epidemic travelling thousands of miles in which two infective agents are involved without one or the other being left behind in the process. It is therefore a matter for serious consideration whether the cases returned as "influenza Y", or, more correctly, as of unknown aetiology, were not in reality infected by the same virus as that responsible for the cases which could be diagnosed.

The third paper, written in collaboration with two officers from Camp Borden Military Hospital, gives an account of the same epidemic as it appeared in that military establishment, and also details the results obtained in four other epidemics observed in the same camp during the period 1940-43. This emphasizes once again the protean nature of influenza, for of the five outbreaks two were due to influenza A, one to influenza B, and the remainder were of undetermined aetiology.

Spectacular as have been the advances of recent years in research in influenza, it cannot be said that, faced with a disaster such as that of 1918, we are yet in a position to do anything very dramatic in order to prevent its spread. The virus responsible for the next pandemic will almost certainly be one that is unrelated to those now isolated. For this reason it will be necessary first to isolate the virus. This in itself may be a difficult proceeding, for a susceptible animal will first have to be found. Even supposing this proved to be possible, the manufacture of vaccine in sufficient time for use in the epidemic is—by all present indications—a sheer impossibility. And vaccines compounded from known strains will almost certainly be useless.