

Influenza does not leave any great degree of immunity in the individual attacked, so that it is always certain of finding a sufficient number of susceptible individuals to enable it to become epidemic, given the general conditions—climatic and otherwise—necessary for its full development. A pandemic of influenza therefore provides a favourable opportunity for an organism associating itself with the influenza bacillus to attain a high degree of virulence. Doubtless this has been the case in the pandemic of 1918, and we shall presently learn what was this complicating organism attached in symbiosis with the influenzal virus. It is obvious on this hypothesis that where preliminary infection, be it measles or influenza, strikes a community of low resistance the epidemic is likely to assume serious characters.

It may be noted here that the reports of the Principal Medical Officers show that the disease was primarily an influenzal infection with potentialities for pneumonic or septicæmic complications in a large proportion of cases, and to a much lesser degree leading to meningococcal infection. Out of 4,740 cases in Featherston and Trentham in November 523 pneumonic cases arose—i.e., in slightly over 11 per cent. of the cases. In no case has the pneumonic type been reported without the preliminary influenzal symptoms, so that the symbiosis of infecting agents seems to have been complete.

The complications arose in the cases independently of their admission to the hospitals. The conclusion, then, is that the complicating organisms were already of a sufficient degree of virulence to be able to invade without the rapid transference of infection and consequent heightening of potency which occurs when cases of acute infection are crowded. Where such crowding took place naturally the virulence would increase, but this was not essential to the development of pneumonic complications.

Protection following Attack.

The evidence as to the degree of immunity conferred by an attack of influenza of the first-wave type against the severe pneumonic form is indefinite. I have already suggested that in Trentham there was evidence of a partial immunity, but in the shifting population of a camp it is not safe to draw conclusions, for in two months a large part of the population may have changed. The Principal Medical Officer, Trentham, found that generally the cases who had suffered during the earlier wave of infection did not suffer in the second. He quotes one case in which a man discharged on the 31st October was readmitted on the 4th November with a second attack, but did not show any pneumonic symptoms; and similar cases are known in which the second attack seems to have been modified. I know of several cases in which one member of a family attacked in September or October remained immune in November, while others of the family who escaped the earlier infection suffered in the second. On the other hand it seems probable that the Narrow Neck troops showed little acquired immunity. The Commandant at Awapuni also reports that the first attack did not confer immunity from the second. At Featherston the Principal Medical Officer reports that those who suffered from four to six weeks before escaped lightly in the second epidemic. The records kept by the Sanitary Officer, Featherston, show that out of 301 cases of pneumonic infection in November 23 had suffered from a prior attack in August, September, or October, and of these 14 died. This high death-rate suggests that these were cases specially susceptible to infection, but the total number is not great. Had there been no conferred immunity one would have expected a higher proportion of severe second attacks, as there must have been many hundreds of soldiers in Featherston who had suffered in one or other camp during the previous months, and, judging by the general proportion of cases developing pneumonic complications, one might have expected at least 50 to 60 such cases amongst them. It is evident that a partial immunity is established for some weeks. The point is of importance, since by the existence or absence of such immunity one may judge as to the value of the use of a vaccine. The opinions of observers in other countries differ greatly, but on the whole it seems likely that if we knew the specific organism concerned a vaccine made therefrom would have a measure of success. The fact that there was a degree of immunity conferred by the first epidemic establishes also the bacteriological identity of the two outbreaks; they differed only in degree of virulence.

Value of Isolation.

No one who has studied the history of influenzal epidemics can doubt that complete isolation would absolutely protect a community. Many cases can be quoted, and in regard to military units the freedom from infection of the German internment camps in New Zealand can be cited. Theoretically it is possible, but in actual practice no means exist whereby we can secure perfect isolation if the country's work is to be carried on, since the disease is of so insidious a character that any developing catarrh would have to be isolated as a possible harbinger of more serious infection. Sir Arthur Newsholme, President of the Local Government Board, London—an eminent authority on epidemiology—says he knows no measures which can resist the spread of a pandemic of influenza. (*Lancet*, 23rd November, 1918.)

Inhalation Chambers.

The experience in the camps since the systematic inhalation treatment of recruits and contacts was adopted has been emphatically in favour of this measure as a means of coping with all catarrhal infections of the naso-pharynx, especially measles. The absence of diphtheria in the camps during the past two years, despite the existence of widespread epidemic in the civil population, is significant, as also the fact that since its adoption measles has been kept in check, and such cases as arose have not been followed by serious complications.

A reference to the last table shows that the troops on embarkation are almost wholly free from suspicious throat-infections, a result in which the inhalation chamber plays a large part.