

## INFANTILE PARALYSIS.

Professor C. A. Kling, who is the Director of the State Bacteriological Institute in Stockholm, and who represents the Swedish Red Cross on the Advisory Health Committee of the League of Red Cross Societies, has pointed out how useful a part the Red Cross can play in spreading the knowledge already acquired concerning infantile paralysis or acute anterior poliomyelitis. If it must be confessed that certain important elements of this particular jigsaw puzzle are still missing, enough is known about it to dispel the panic which goes with the wholly unknown.

What is known is that the disease proves rapidly fatal in many cases, that in many others it leaves permanent paralysis, that these are due to changes in the spinal cord, that the virus responsible for the disease passes through filters holding back germs visible under the microscope, and that the same disease can be conveyed to experimental animals.

In addition to these facts which have been established for

longer than ten days, and in more than half the families, this interval was one of five days or less. These observations suggest that the infections to which these families were exposed must have been simultaneous or almost simultaneous.

Another curious observation was that in the families in which there were several cases, those which developed latest usually ran the mildest course. Linked up with this observation may be the well-known experience that in experimental poliomyelitis the disease runs a course whose mildness is directly proportional to the length of the incubation period. It would seem, therefore, that the human cases of infantile paralysis which are least severe are those whose incubation period is longest.

When the cases of infantile paralysis in the County of Bohus in 1936 were mapped out in order of their occurrence, it was found that peaks occurred at the same time at many widely separated points. This sudden outbreak of many cases far apart from one another suggested some simultaneous, common cause rather than spread of infection from one point to another. The appearance of the disease at different points some 1,000 kilometres apart could not possibly be explained on the assumption that it had travelled from one to another; there must have been some external factor operating simultaneously at the different points.

The marked tendency of the disease to show a preference for special seasons of the year suggests that meteorological factors play an important part in its evolution. What are these factors? It has been found that an outbreak is arrested when the temperature falls definitely below freezing point; the disease does not resume its former course till, in Sweden at any rate, the temperature has again risen above freezing point about the beginning of March. But it is not till about the beginning of July, when the temperature of the air has reached its maximum, that the disease also reaches its maximum. Thereafter there is a decline in both the temperature of the air and in the frequency of the disease.

What is still more interesting, and what research workers in Sweden have but recently observed, is the uniformity with which the disease breaks out within a given period of heavy falls of rain. If an epidemiological chart be superimposed on a meteorological chart showing the periods of heavy rainfall, it will be seen that between the first day of rain and the first new case of an outbreak of poliomyelitis there is an interval of 6 to 24 days. This sequence—heavy rainfall, an interval of one to three weeks, and then the beginning of a new outbreak of poliomyelitis—has recurred with such regularity and uniformity as to create the impression that the degree of rainfall and the number of days it lasts determine in some way or another the subsequent behaviour of an outbreak of the disease.

These observations may thus be interpreted: the virus of the disease may exist somewhere outside the human body, and heavy rains carry this virus through water to the human body, either directly or indirectly through milk, vegetables, etc. The differences in the behaviour of the disease in town and country may find their explanation in the theory that the infection is carried from the latter to the former in farm produce and non-pasteurized milk. In this connection it was noticed in the Swedish town of



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Treatment of child suffering from Infantile Paralysis  
In an "Iron Lung" at Lord Mayor Treloar's Hospital, Alton.

several years, there are other facts whose discovery is of more recent date. In a communication to that international health Parliament, the Office International d'Hygiène Publique, Professor Kling presented on behalf of his compatriot, Dr. Sven Gard, a report on certain most interesting observations recently made in Sweden where there has been a considerable rise in the frequency of infantile paralysis during the last few years. It may be said at once that many of these observations are confirmatory of the theory held by Professor Kling for some time that infantile paralysis is a water-borne disease, though it may not necessarily be conveyed to man in the same way that certain other water-borne diseases are.

In the first place it has been observed that infantile paralysis appears to be endemic in certain localities in Sweden, and to afflict certain families heavily. Thus in the County of Bohus in 1936, there were as many as 41 families in each of which more than one case occurred. There was indeed one family with five cases, and another with seven. In only three of these families was the interval between the beginning of the first and of the last case

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