THE INFLUENCE OF SCHOOL ATTENDANCE ON THE WEEKLY INCIDENCE OF SCARLET FEVER AND DIPHTHERIA IN LONDON DURING 1892 AND 1893.

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A.—SCARLET FEVER.

WITH a view to showing the number of cases in each week in relation to the mean of the year, Diagrams VIII. and IX. for the years 1892 and 1893 respectively have been prepared (of which Diagram IX. is here reproduced). It will be observed that in the "all age" curves for these years there is a depression in that part of the curve which relates to the month of August, the August depression in the curve for 1893 being much greater than the August depression in the curve for the year 1892. The curve for the year 1893 deserves, therefore, closer examination. If, for this purpose, the cases of scarlatina notified in that year be divided into three classes—(a) those occurring in children from 0—3 years of age, (b) those occurring in children from 3—13 years of age, and (c) those occurring in persons above 13 years of age—the cases may be considered in relation to school operations, these three groups representing practically (a) those who are too young to attend school, (b) those at the school age period of life, and (c) those who have in great part left school. If curves be constructed with the cases included in these three groups it will be seen that the August depression is much accentuated in the curve relating to children from 3—13 years of age, and that the depression in the curve relating to infants from 0—3 years occurs a little later. This striking diminution of scarlet fever in the month of August, occurring especially among children at the school age period of life, necessarily raises the question whether disease had been spreading in schools, and whether the summer holiday has arrested the spread of disease due to this cause.

At this season of the year there is, however, another condition which deserves consideration. Coincident with the closing of schools, children in considerable numbers migrate from London, and it may be that the diminution in the number of cases of scarlet fever in August is in some part attributable to this migration. Such inquiry as I have been able to make does not, however, lead me to the conclusion that this circumstance affords sufficient explanation of the reduction of scarlatina during the month of August. School operations must therefore be further considered. I am not able to show for each week the number of children in London who are attending school, but so far as the operations of the schools of the London School Board are concerned the dates at which the schools generally close and re-open can be given. It is probable that the times of the closing and re-opening of many other London schools correspond

with the times of the closing and re-opening of the schools of the Board.

In 1892 the schools of the London School Board generally closed for the summer holidays on the 21st of July, *i.e.*, towards the end of the 29th week, and re-opened on the 22nd of August, *i.e.*, the beginning of the 34th week. If time is allowed for the period of incubation and a little delay in notification, any effect of school closure on the number of scarlatinal cases notified might be expected to be manifested in the returns for the 31st, 32nd, 33rd, and 34th weeks, and the diagram shows that the August depression corresponds with these weeks. Comparison between the number of cases in three periods of four weeks, (1) the 27th—30th week, (2) the 31st—34th week, and (3) 35th—38th week at several ages gives the following results:—

	Under 3 years.	3—13 years.	13 years and above.
Increase or decrease per cent. of number of cases in 2nd period in relation to that of 1st	+ 25	— 9	+ 9
Increase per cent. of number of cases in 3rd period in relation to that of 2nd ...	Nil.	+ 52	+ 15

In the diagram for the year 1893 the August depression is still more marked. In this year the schools generally closed on the 27th July, *i.e.*, nearly the end of the 30th week, and reopened on the 28th of August, *i.e.*, the beginning of the 35th week. Diminution in the number of cases notified might be expected therefore in the 32nd, 33rd, 34th and 35th weeks, and the August depression in the diagram corresponds with these weeks.

If comparison be again made between three periods of four weeks, *i.e.*, 28th—31st, 32nd—35th, and 36th—39th, the following results are obtained:

	Under 3 years.	3—13 years.	13 years and above.
Decrease per cent. of number of cases in 2nd period in relation to that of 1st ...	— 1	— 26	— 17
Increase per cent. of cases in 3rd period in relation to that of 2nd	+ 9	+ 65	+ 26

There appears, therefore, to be a very close relation between the August holidays and the diminution in the amount of scarlatina.

B.—DIPHTHERIA.

In view of the change in the age incidence of diphtheria mortality shown in my special report,* it is desirable that diagrams illustrating the number of cases notified in each week in the years 1892 and 1893 should be studied as in the case of scarlet fever. Diagrams XII. and XIII. have therefore been prepared for this purpose (Diagram XIII. is here reproduced).

It is unnecessary to repeat here the observations on the subject of school influence which have

* Preliminary Memorandum on the Increase of Diphtheria in London.

NOTIFIED CASES.

Scarlet Fever, 1893.

NOTIFIED CASES.

Diphtheria, 1893.

already been made in discussing the decrease of scarlet fever in the month of August. It may however be pointed out that the August depression in the all-age diphtheria curve of 1892 is not obvious, but that of 1893 is distinct, and is especially conspicuous in the curve relating to children from three to thirteen years of age.

Comparison of three periods of four weeks, in 1892, viz., (1) 27th—30th, (2) 31st—34th, and (3) 35th—38th, gives the following results—

	Under 3 years.	3—13 years.	13 years and above.
Increase or decrease per cent. of number of cases in 2nd period in relation to that of the 1st	+ 20	— 3	— 10
Increase or decrease per cent. of number of cases in 3rd period in relation to that of the 2nd... ..	— 7	+ 29	+ 34

If comparison be made between the three periods of 1893 (1) 28th—31st week, (2) 32nd—35th week, and (3) 36th—39th week, the following results are obtained :—

	Under 3 years.	3—13 years.	13 years and above.
Increase or decrease per cent. of number of cases in 2nd period in relation to that of the 1st	+ 8	— 27	+ 1
Increase or decrease per cent. of number of cases in 3rd period in relation to that of the 2nd... ..	+ 6	+ 81	+ 33

NOTES ON "A MILK-OUTBREAK" OF THROAT AFFECTION RESEMBLING DIPHTHERIA.

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A MARKED epidemic of throat-illness made its appearance in the Finchley District on the 8th and 9th of November, 1894, and by the 18th the cases had numbered nearly 100. By the courtesy of those medical men who were called in to treat such cases I was permitted to personally examine many of them, and we unanimously agreed that the disease in question was not diphtheria, although the appearance of the throat was in many cases markedly diphtheritic. The symptoms were: A sudden onset of inflammation with marked swelling of one or both tonsils and to a less extent of the uvula, soft palate and pillars of the fauces; considerable constitutional disturbance; swelling of the glands beneath the angle of the jaw; furred tongue and foul breath. Within forty-eight hours one or both tonsils (most frequently one, and that the left) presented whitish-yellow patches—sometimes partially, at others completely—covering the tonsil and spreading over the

adjacent parts. The patches generally looked very wash-leathery, and in one or two cases I detached small thick leathery pieces, leaving a somewhat raw surface behind; and frequently one or more little white superficial ulcers were to be seen on the fauces. I did not make an ordinary microscopical examination of these patches, but I have little doubt that "the membrane" in these cases consisted mainly of inspissated secretion from the mouths of the follicles. The constitutional symptoms of this stage were very pronounced; the temperature generally varied from 101°—105°, there was a marked amount of collapse, great thirst and complete anorexia; headache was complained of and the tongue became very thickly furred. I was informed that there was albumenuria in two or three cases. I made tube cultures from six different throats, but a microscopic examination, though it showed abundance of micrococci, disclosed nothing resembling the Klebs-Löffler bacillus. The general duration of the disease was about a week, when in at least a dozen cases a remarkable circumstance arose: The original throat-affection had markedly cleared up, and after a day or two of comparative convalescence the temperature suddenly rose, and more or less true diphtheritic symptoms supervened, and in the three cases examined the Klebs-Löffler bacillus was present. As to the true explanation of this, our present knowledge admits of no more than conjecture; it is one of the many problems in bacteriology that have yet to be solved. It is a common experience to find cases of true diphtheria crop up in connection with such outbreaks. I am informed that two of those who did *not* experience such a relapse, and who were not thought to be victims of diphtheria, have subsequently developed paralytic symptoms.

Next as to the etiology of the outbreak. A significant fact was the grouping of the initial cases within a very limited area; twelve of the first twenty-four cases, representing infection in five different households, were in Hendon Lane, and the other twelve cropped up in the immediate vicinity of that street; later on the area of incidence had become extended (though unequally) over the whole district.

Although the weather during the preceding fortnight was such as would in itself account for many so-called "sore-throats," there was sufficient in the appearance of the throats in question and in the concomitant symptoms to stamp them as something more than simple catarrhal conditions. In addition to exceptional conditions of rainfall, the range in the temperatures recorded during the preceding three weeks had been 36·9° Fahr.; the maximum daily range had been 14·7°, and the humidity of the air had averaged 90·4 per cent. of complete saturation. These atmospheric conditions, especially in the autumn of the year, and in a district naturally somewhat cold and damp by