A HUNDRED YEARS AGO

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OUTBREAK OF MILK-BORNE DIPHTHERIA

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A RECENT OUTBREAK of milk-borne diphtheria in Upper Norwood presents several features of interest.

A total of 117 cases (one death) were traced, occurring in Lambeth and several neighbouring districts. Twenty-six of the cases were secondary. The type of the disease was very mild, and the incidence was upon adults (women chiefly), the patients living in better, or even the best, class houses. A total of 17 of the persons notified were under 10 years of age (2 under 5 years) and 100 were over 10 years of age (18 over 40 and 4 over 60 years).

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The incidence of the outbreak was more or less localized, and pointed to some factor or factors at work over circumscribed area or areas, such factors proving to be:

A Infected cows and cowmen (infecting centrally)
B Infected milk distributors (infecting locally)

Infected cows and cowmen (infecting centrally)

The infected farm was discovered in Sussex, where several cows were found to be ill, two with mastitis, giving milk unfit for use, and the others with teat eruptions; and several milkers with sores on their hands, and one cowman (also a milker) with an ulcerated finger.

This cowman was found to be suffering from an indolent ulcer on the back of one of his fingers, the wound having commenced apparently with a scratch received from a thorn, the scratch becoming ulcerated and remaining so for a month, when the finger (being a hindrance to milking) was amputated.

The medical man in attendance suspected tuberculosis or malignant growth, but bacteriological examinations of the amputated finger showed that the ulcer was simply of an inflammatory nature. The ulcer was found to be infected with organisms indistinguishable culturally from true diphtheria (Klebs-Loeffler) bacilli, which proved by inoculation experiment on guinea pigs to be virulent. There was no evidence found of tubercle, syphilis, or malignant growth.

Prior to having his finger amputated, the cowman had been at work assisting in milking the cows with the ulcer present upon his finger and simply wrapped round with a rag or bandage. The ulcer was, therefore, diphtheria-infected and capable or adding germs to the milk, and by inoculation transferring them to the cows and through the cows to the other milkers, one of whom was found to be infected also in a sore in the hand with the true diphtheria (Klebs-Loeffler) bacillus.

If the cowman infected the cows, he may have contracted the diphtheria in his ulcer from his own throat or nose, during the well-known habit of milkers of spitting upon their hands prior to starting milking. However, no true diphtheria, nor any other suspected bacilli, were obtained from the cowman's throat or nose on examination, nor were there cases of disease nor of sore throat known in that particular neighbourhood.

The alternative explanation is that the cows infected the cowman and the other milkers by inoculation, but there is no direct evidence to show that the cow's mastitis or teat eruptions were diphtheria-infected, the teat sores being dried up and scaled and giving no results on bacteriological examination.

The cowman's ulcerated finger was infectious for about a month. Diphtheria-infected milk was sent from the farm to the dairy for distribution in Lambeth Borough and in the surrounding districts at the rate of 75 to 90 imperial gallons a day. At the dairy, the infected milk was mixed with the non-infected milk from other farms and other wholesale sources.

It was seen that the infection suddenly ceased coincidently with the whole of the milk supplied from the suspected dairy being pasteurized before distribution to the public. It is difficult to understand why more cases of diphtheria were not notified and why the outbreak was not wider spread.

Infected milk distributors (infecting locally)

The suspected dairy supplied about 10,000 consumers daily at the time of the outbreak. There were 22 regular distributors (and three "odd" men helping the regular distributors at the dairy, and others. Two of the regular distributors were actual "carriers of bacillus Klebs-Loeffler in their throats, whilst one other regular distributor and one "odd" man were probable "carriers," i.e. showed bacillus diphtheroides.

There was evidence of cases being particularly localised to particular roads consistent with the rounds or distributing areas of these "carrier" distributors: 28/44 (66.6 per cent) of cases notified occurred in a small localized area, the round of one of the actual "carrier" distributors.

This suggested a sort of contact infection between distributor and consumer, or what may be termed a limited milk-can or milk-pail infection as opposed to a general milk supply infection.

So diphtheria-infected farm-milk was sent to the dairy, and distributed from there over wide areas, giving rise to cases of diphtheria in many different districts, but more or less sporadic cases amongst the consumers of the milk. Amongst the consumers were the milk distributors, some of whom, in their turn, appear to have caused crops of cases in certain roads by contact infection or milk-can or milk-pail infection, through distributors who were actual or probable "carriers."

Cooking of milk

The incidence of the disease was not upon children and invalids, who are generally speaking the principal milk consumers. The children may have escaped owing to the custom in better class houses of cooking milk that is to be consumed by them, or it may be that they consumed nursery milk, obtained locally, and not from the Sussex infected farm.

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