

This table is a record of deaths in children under five years occurring in our four chief centres during the same decade. Again Auckland heads the list, and again the chief causes of death are diarrhoeal and dietetic diseases, no less than 58 per cent. of the deaths in Auckland in children under five years being due to these diseases; Christchurch, 47; Wellington, 42; Dunedin, 36: average for four centres, 48. The diarrhoeal and dietetic diseases have been taken together because both are probably due to some error in dietary.

What is the cause, or what are the causes of this large mortality from diarrhoeal and dietetic diseases in children? Health Officers in the United Kingdom and in the colony agree that a polluted milk-supply is one of the chief causes of infantile mortality—a preventable cause.

In Brighton in 1901, Dr. Newsholme states that of 226 deaths from diarrhoea in children, it was possible to trace 191 of these fatal cases to the milk-supply.

### (3.) *The Infection of certain Diseases being Milk-borne.*

**Typhoid Fever.**—It was as long ago as 1857 that Dr. Michael Taylor, of Penrith, first declared that the infection of typhoid could be carried by milk. Since that date no less than 160 epidemics of this disease have been traced to that source in the United Kingdom. Certainly two outbreaks of typhoid in this colony have been due to milk. It is stated that 17 per cent. of all typhoid epidemics are due to milk. The germs of this disease are contained in the excreta, urine, expectoration, and sweat, so that it can be easily understood how infection may be propagated by a milker suffering or recovering from the disease.

Typhoid infection may be transmitted by milk by the following means: (1) By infection from typhoid patients; (2) by washing cans with water infected by typhoid excreta; (3) by the fraudulent addition of infected water to milk; (4) by dust from dried excreta containing the bacilli; (5) by contaminated clothes; (6) by cooling milk by placing it in infected water. (Swithinbank and Newman.)

Of the two epidemics of typhoid fever transmitted by milk in this colony, the first recorded was in Wanganui in 1897, when some thirty cases were traced to a dairy where a case of typhoid fever had occurred in one of the employees. When the milk-supply from this dairy was stopped the epidemic ceased.

In 1901 Dr. Makgill, Health Officer for the Auckland District, investigated an epidemic of typhoid fever at the Thames, where forty-three cases occurred in thirty-seven houses. This epidemic was manifestly due to an infected milk-supply from a dairy where the first case of typhoid occurred; cutting off the milk therefrom speedily arrested the epidemic.

**Scarlet Fever.**—It was Dr. Michael Taylor also who first reported that the infection of scarlet fever could be borne by milk. Some 100 epidemics are known to have been caused by this means. In 1903 in Wellington a good many cases of scarlet fever were traced to an infected farm in the suburbs, whence milk was being distributed.

"Throughout the year attention was paid to the possibility of this means of disseminating the disease, and the dairies supplying milk to the city were carefully watched. It was not till the 24th December that anything happened to throw suspicion on milk as the means of carrying infection. On that date seven cases were notified in houses which were all supplied with milk from the same dairy. Inspector Watson was accordingly despatched to the farm, where he found that one of the employees who had been milking until quite recently had been ill with a sore throat—he was subsequently found to be 'peeling.' Another employee developed a rash and sore throat on the following day. The milk was seized and the dairy closed that afternoon."—*D.H.O.'s Report*, 1903.

Altogether fourteen cases were subsequently traced to this dairy.

"In September there was an outbreak of about twenty-five cases in the Papanui district, which was certainly caused by infected milk. The cause of the outbreak was carefully inquired into by me, in conjunction with Inspector McPherson of the Stock Department, but the source of infection could not be found. From the incidence of cases I was inclined to believe that the cases were infected on the same day, and that there must have been some accidental source of infection in the distribution of the milk, and that the infection did not occur on the premises of the dairy."—*D.H.O.'s Report*, 1904.

**Diphtheria.**—Many epidemics of this disease have been reported as having been caused by milk, which is particularly favourable to the *Bacillus diphtheræ*. This organism lives and thrives in sterilised milk. In ordinary milk the organism is often crowded out by other bacilli. There are a few cases, however, in which the actual bacillus has been isolated from the suspected milk (Bowhill, Ayre, and Dean), and the organism so isolated has been injected into guinea-pigs with fatal results.

It is questionable how milk becomes infected by the diphtheria bacillus. It may possibly gain entrance by means of dust, but almost always by means of persons suffering from mild attacks of diphtheria. There are about forty recorded epidemics of milk-borne diphtheria. In this colony one striking epidemic is recorded by Dr. Finch, District Health Officer for Canterbury:—

"In consequence of diphtheria being reported from time to time in Lyttelton, and a large proportion coming from one milk-supply, I asked the Dairy Inspector, Mr. McPherson, to inspect the dairy and send some samples up for bacteriological examination to Wellington. This was done on the 14th July. He informs me that in the samples from one cow there was distinct evidence of suppurative mammitis. The milk-supply from that cow was stopped, and up to the present there have been no more cases reported in Lyttelton."

**Sore Throats.**—It is well known that many epidemics of sore throat have been caused by milk. Instances of this have occurred in this colony, the cause of the disease being the drinking of milk from cows suffering from a particular form of inflammation of the udder—mammitis, which is very prevalent in the colony. (See Chief Veterinarian's Report, 1904.)

Evidence goes to show that the chief danger exists in the cream from such cows. In the United Kingdom several fatal cases of sore throat have been traced to this cause.