

of typhoid bacilli or agglutinating properties. The family was advised to undergo inoculation, and this was carried out by the local doctor during the latter part of April, the final doses being given on the 3rd May. A vaccine was used containing *B. typhosus*, 1,000 million per cubic centimetre; *B. paratyphosus A*, 750 million per cubic centimetre; *B. paratyphosus B*, 750 million per cubic centimetre. A. and K. received $\frac{1}{2}$ c.c., followed by 1 c.c., and the boys $\frac{1}{4}$ c.c. and $\frac{1}{2}$ c.c. B. and C. both refused inoculation, and through an oversight D. was not inoculated.

On the 13th June two rabbits were found to be camping on the property, about a mile from the house, near a small stream from which frequently T. W. had been known to drink. Specimens of blood, faeces, and urine were taken from these men, and all proved negative. The water-supply was fully investigated and found to be an unlikely channel of infection.

On the 22nd June F. A., one of the boys, was taken ill, and sent to hospital on the 2nd July, typhoid bacilli being found in the faeces on the 11th July. As a result of his inoculation the attack was a mild one.

Fresh specimens of faeces were obtained from every member both of this household and the nearest neighbouring household. All were negative as regards the presence of typhoid bacilli.

The housekeeper, B., left the farm on the 1st July and came to her home in Dunedin. As soon as this fact was known a visit was paid to her and further specimens of blood, urine, and faeces obtained, all being negative. As shown later, she was then incubating the disease.

On the 11th July D., who had escaped inoculation, was taken ill. He was seen by a doctor and notified as suspected typhoid on the 16th July, and was removed to hospital on the 17th. The attack was a severe one, and he died on the 1st August.

On the 16th July the domestic, C., returned to her home near Dunedin. She was seen on the 19th and interrogated closely as to previous illness, and further specimens of urine and faeces were obtained. These also proved negative. On the same day three samples of water and one of milk from A.'s supply were sent down for bacteriological investigation, but no suspicious organism was discovered.

On the 23rd July a third visit was paid to the house by a medical officer. The area of investigation was considerably narrowed down by this time. The last two cases of the disease had made it practically certain that Mrs. A. and B. J. had died of the disease, and that there was a "carrier" in the house. Disregarding the small boys, the only persons who had been in the house over the period in question were: B., 5th March to 1st July, 1928; C., 22nd February, 1927, to 16th July, 1928; K., since 1st July, 1927; and A.

The two former were in or near Dunedin and under close observation, and attention was turned to K. and A. The latter's past history furnished no clue. He was inoculated in April and had a fairly severe reaction therefrom. K., who is aged sixteen, was questioned closely. He denied having had typhoid fever, but admitted having been in the Dunedin Hospital for several weeks some years previously—he thought, with diphtheria. He also was inoculated in April, and apparently had only a very slight reaction. He usually milked the cows, and had been living on the farm since about six weeks before Mrs. A. was taken ill. Samples of blood were taken from both of these persons.

On the 25th July A.'s blood was found to agglutinate typhoid bacilli up to a dilution of 1/100, and K.'s blood agglutinated up to 1/1000 dilution. This was taken as fairly conclusive evidence that the latter would have given a positive Widal reaction if tested prior to his inoculation. A search through the Dunedin Hospital records also revealed the fact that he was admitted on the 10th September, 1920, when aged seven, as a case of typhoid fever. Blood taken on the day of admission was found to contain typhoid bacilli. Faeces and urine taken on the 13th September, 2nd October, and 9th October, 1920, were free from the organisms, and he was discharged on the 11th October, 1920, as "cured and free from infection." He was immediately wired for, and admitted to the Dunedin Hospital on the 27th July for a more thorough investigation of his infective condition. Meanwhile a third specimen of faeces taken at the farm on the 24th was found to contain typhoid bacilli. This result was known on the 28th July.

On the 18th July B., who had left the farm on the 1st July, showed the first symptoms of the disease, and her blood gave a positive Widal reaction on the 25th July. She had refused inoculation in April. It is interesting to note that a sample of her blood taken on the 17th July gave a negative Widal reaction. The disease ran an uncomplicated course, and she made a good recovery.

The history of K. from the date of his discharge from hospital in October, 1920, is as follows: He returned to his mother's house in Don Street, Dunedin, and lived at home until June, 1924. The family lived at various addresses, and during 1921 moved to a house in West Road. His mother states that during that time there was no illness in the family.

A search through the notification records during this period shows that there were eleven notifications of typhoid fever occurring in Dunedin during 1921, three in 1922, two in 1923, and two in 1924. Of these, two occurred in 1921 in West Road, and the remainder were all from distant parts of the city. The two cases reported from West Road in 1921 were those of a boy of ten and a girl of six, living in adjacent houses. The boy, Charles M., was admitted to hospital on the 16th March, 1921, the illness having begun on the 9th March. It was definitely proved typhoid. The girl, Roma T., became ill on the 17th April and was nursed at home. The medical attendant diagnosed paratyphoid, but no bacteriological examination was made. It was thought that the first case was the cause of the second, but the time interval between the two makes it more likely that each contracted the disease from the same source. Mrs. T. remembers K.'s family, who lived in a small house opposite at the time that her small girl was taken ill. She states that she did not associate with them in any way, but it is possible that their children played together at times. There is a possibility, therefore, that these two children were infected by K., who was then nine years of age.