

sults, the wheels of our machine must run smoothly and with as little friction as possible.

7. It is the duty of every one of us to help to develop public opinion to the point when the dangerous and incorrigible consumptive can be accorded the treatment which he deserves. We must not, however, allow public opinion to reach the point where every person who is unfortunate enough to contract tuberculosis, is looked upon as a leper and ostracized from society; finally, I would urge that we remember at all times, and particularly those who are doing purely administrative work, that we are dealing with human beings who happen to have pulmonary tuberculosis, and not merely with "cases."

EPIDEMIOLOGY OF TYPHOID FEVER IN A NEW ENGLAND CITY.

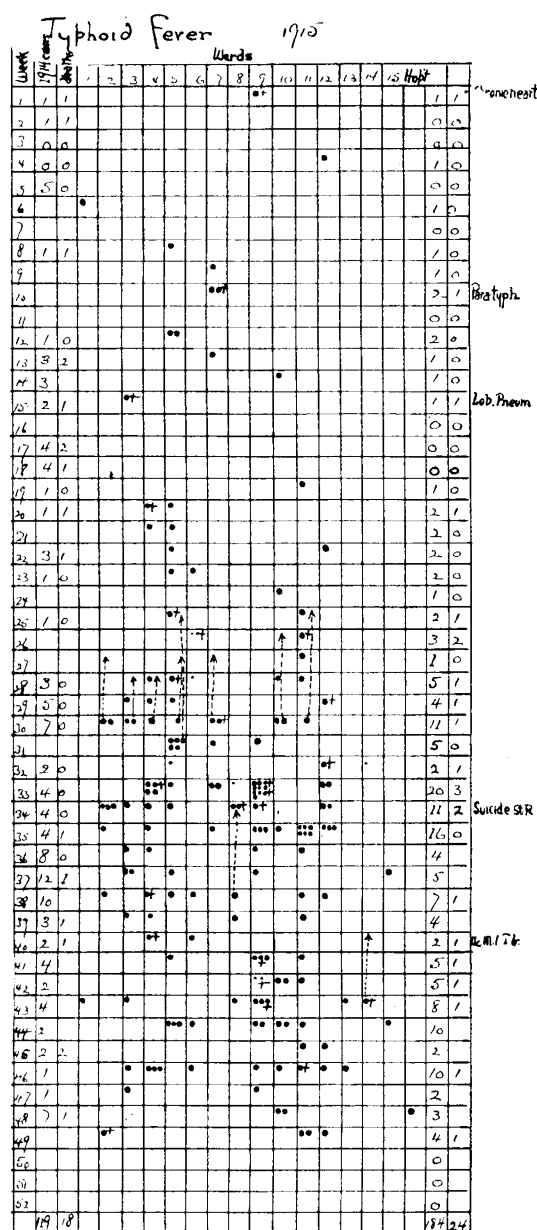
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IN no other field of preventive medicine have more brilliant results been obtained than in the reduction of typhoid fever by elimination of polluted sources of drinking supplies. Together with milk-borne epidemics of frequency, these factors represent the usual causes for investigation of all communities which have any continued yearly frequency of the disease. In being unusual but equally satisfactory from the standpoint of results, I believe the demonstration that a high frequency may show another factor is of especial interest and value from the standpoint of a Northern city.

Beginning the study of this disease in 1914, there was a very definite record of a past history, which was divided in two parts; the first comprised a period of twenty-five years following the incorporation of the Board of Health, 1872, during which period the yearly reports of the Board were almost entirely devoted to privy vaults, cesspools and typhoid fever. In 1885 there was made a survey of the city, which extended through the following two years and showed the following facts: There were 21,600 houses on sewered streets that were not sewer connected. There were 7771 outside privies and 4794 cesspools. As records of Prof. William H. Brewer and Dr. C. A. Lindsley, the two ablest sanitarians in the history of the city, the relation of such to typhoid

fever was most convincing. The second period was one of complacency. In 1897 there had been abolished 1236 of these privies and 164 cesspools. In 1914 it was estimated that there were but 100 privies existing on sewered streets. During this latter period, in 1901, there had ensued a water-borne epidemic of typhoid, which resulted in making the sources safe by cleaning off all habitations from the watersheds. There was also on record an institutional epidemic, where defective sanitation of the premises was found causal. The report was unsatisfactory to the county authorities who had charge of the institution, and an outside expert, on investigating, reported that the evidence was clearly from neighboring vaults and flies. In that this factor was on record then for the first time, and because of the later absence of such findings, it is emphasized for its bearing on this paper.

At the end of the first year's work, 1914, the general impression that the larger proportion of the typhoid was from privy vaults was fairly evident from the distribution of the cases by weeks and by wards and in the presence of neighboring outside vaults or outside sewer-connected hopper closets. In the absence of any milk factor both during this year and the nine previous years, which also had very generally a distribution around privy vaults, it was not until 1915 that definite results were obtained. Reporting the data on the case in the Board of Health Bulletin of this city for September, 1915, it was shown that one individual caused 13 recorded cases in a localized neighborhood where there was no record of any typhoid previous to her residence there, during the ensuing four years—1906-1909. Two of the cases were members of her own family. Removing to another neighborhood more thickly settled, there were immediate neighborhood cases to the reported number of 33 in the three following years, the next two years giving 6 reported. One further child and one boarder during the first two years of the latter residence were also cases in the family of this carrier. Well shown in the chart for 1915, this carrier was a reported hospital case in the 31st week (9th ward). She had returned from a visit of three weeks in another State to her home here, where she was ill for six days before her hospital admission. The 24 cases of the ensuing three weeks all dated their incubation period from the duration of illness to the



fact that those for 1915 dated to the two weeks that the fecal contents were exposed in the privy.

Although we have never had repeated such a chain of circumstances as proving our case in all instances, the reported cases in the 4th ward for 1915 were as satisfactorily traced to a neighborhood outside hopper closet, which was definitely a comfort station for a large population. The reported cases were similarly distributed as to age, sex, scattering and absence of other common factors. Ordered padlocked for family use only, the following two years has seen but 5 reported cases in the

whole ward, all of which were accounted for by other factors. As sharp were the demonstrations of the relation between cases and vaults in Wards 11 and 12, with correspondingly less reports for the following two years. Similarly, the yearly record for Wards 6, 7, and 8, all presumed sewer wards, led to neighborhood filthy outside hopper closets or to remaining privy vaults. Ward 5 alone has been a striking example of apparent house-to-house contact infection.

The logical and satisfactory end-result of our proof is that during the first half of the fifth year (1918) there have been in twenty-five weeks 10 reported cases and 1 death (an im-

