

vision of cases of illness, which means the requirement of morbidity returns and the prompt notification of all suspicious cases, protection of milk and other foods from typhoid contamination, elimination of flies and their breeding-places, control of typhoid carriers, and the use of anti-typhoid vaccine wherever feasible.

Dr. Freeman's viewpoint is unquestionably sound, but in the broad analysis his estimates of what filtration would do are perhaps a little too low. For years it has been recognized that efficient filtration of the public water supply of a community will result in a reduction of from two-thirds to three-quarters in the typhoid fever death rate. Where the initial rate is high the percentage reduction following filtration of the water supply usually is correspondingly high, as noted particularly in the cities of Albany, Cincinnati, Columbus, Lawrence, Philadelphia and Pittsburgh. In these cities the average typhoid fever death rate for the five-year periods before and after filtration, respectively, showed a reduction of 76 per cent., or a typhoid fever death rate per 100,000 population of seventy-nine reduced to nineteen. The combined result of water filtration in twenty representative cities showed that filtration was followed by an average reduction in the typhoid fever death rate of 65 per cent.

Table 16.

Reduction in typhoid fever death rates in American cities following the filtration of their public water supplies (averages for five years before and five years after filtration):—

City	Average Typhoid Fever Death Rate		Per cent. reduction in Typhoid Fever Death Rates which followed the filtration of the Public Water Supply
	Before Filtration	After Filtration	
Albany, N.Y.	109	28	74
Charleston, S.C.	106	62	41
Cincinnati, O.	56	11	80
Columbus, O.	83	17	78
Harrisburg, Pa.	72	33	54
Hoboken, N.J.	18	13	28
Indianapolis, Ind.	46	28	39
Lawrence, Mass.	110	23	79
Louisville, Ky.	57	24	58
New Haven, Conn.	40	25	38
New Orleans, La.	39	26	33
Paterson, N.J.	29	9	69
Philadelphia, Pa.	63	20	68
Pittsburgh, Pa.	132	19	85
Providence, R.I.	19	13	31
Reading, Pa.	53	35	34
Scranton, Pa.	25	10	60
Springfield, Mass.	22	22	0
Washington, D.C.	55	31	43
Wilmington, Del.	35	24	31
Weighted averages...	60	21	65

Among sanitarians there appears to be little, if any, dissension from the view that modern filtration practices actually eliminate the water-borne diseases, or typhoid fever and allied disorders at the very least. That is to say, where the plants are properly designed, well constructed, and intelligently operated, water filtration, in practical terms, is one hundred per cent. hygienically efficient.

Table 17.

Relationship between the increase in population supplied with filtered water and the decrease in the typhoid fever death rate in the registration cities of the United States:—

Year	Populations		Per cent. which filtered water population was of		
	Total for registration cities	Total in United States supplied with filtered water	Total population of United States	Total population registration cities	Typhoid fever death rate in registration cities
1900 ..	21,477,000	1,860,000	2.4	8.7	36
1 ..	22,146,000	2,400,000	3.1	10.8	34
2 ..	22,679,000	2,700,000	3.4	11.9	37
3 ..	23,221,000	3,100,000	3.8	13.3	38
4 ..	23,724,000	3,800,000	4.6	16.0	35
5 ..	24,729,000	4,300,000	5.1	17.4	30
6 ..	26,342,000	5,400,000	6.7	20.5	33
7 ..	27,145,000	6,300,000	7.2	23.2	32
8 ..	28,501,000	7,500,000	8.4	23.3	25
9 ..	29,655,000	8,900,000	9.8	30.1	21
1910 ..	21,342,000	10,805,000	11.7	34.6	24
11 ..	32,376,000	12,000,000	12.8	37.2	20
12 ..	33,304,000	14,100,000	14.7	42.4	16
13 ..	34,230,000	16,500,000	17.0	48.0	16

In Table 17 and Plate VIII. some instructive statistics are presented to show how the urban typhoid fever death rate has been reduced as water filtration developed. The relationship between the two is strikingly proportional, and holds out every good promise for the future.

FIRE PROTECTION ON RAILWAYS.

The Board of Railway Commissioners' Fire Inspection Department issued orders recently, under general order 107, directing the C.P.R., the Canadian Northern Railway and the Grand Trunk Pacific Railway to maintain a sufficient force of fire rangers for efficient patrol and fire fighting duty on their lines, between April 1 and November 1, except in so far as they may be relieved from so doing by an order in writing from an authorized officer of the Board. The directions of the order are specific in each case, and the areas within which the patrols are to be maintained are fully set out. The directions to the C.P.R. cover mileages on the Manitoba, Alberta and British Columbia Divisions; to the Canadian Northern Railway, mileages on the Central Division, and to the Grand Trunk Pacific Railway, mileages on the Mountain Division. For the supervision of the work, the Board has appointed inspectors, located as follows: E. J. Zavitz, Toronto; Thos. McNaughton, Prince Albert, Sask.; P. C. B. Hervey, Edmonton, Alta.; E. H. Finlayson, Calgary, Alta.; D. R. Cameron, Kamloops, B.C.; M. A. Grainger, Victoria, B.C.; H. S. Irwin, Prince Rupert, B.C.; R. E. Allen, Hazelton, B.C.; H. G. Marvin, South Fort George, B.C., and P. S. Bonney, Tete Jaune, B.C. The object sought to be obtained is the prevention of fires along railways, and to avoid as far as possible the imposition of unnecessary expenditure upon the companies for that purpose. An efficient system of fire patrol can be established at a minimum expenditure, and as the conditions vary from time to time and from place to place, the fire inspectors appointed by the Board have authority to waive the requirements wholly or in part from time to time as practicable. The order in each case calls for the minimum of adequate protection.