

much danger in practice comes from the situation as it is? Mind you I am not approving of it, not necessarily; but what is the practical danger? It is that you may get in four or five million gallons of water one drop that has a typhoid germ. Now then the question arises does that constitute, or has it constituted a practical danger? Not that it may not do so, I will not say that it may not, but does it, or has it ever? To-day we know that we have had three epidemics since the first one I investigated here in 1887 when that wooden pipe in the aqueduct here had strips torn off it, and the water from the aqueduct got into the pipe.

Q. It was the anchor ice did it, was it?—A. No, it was in the autumn when it occurred, the winter ice had gradually worn off the surface of the old oak staves in the pipe; that was the first epidemic, and I was sure it was a water epidemic because it spread to Sandy Hill and every part of the city. Next year when they closed the end of the pipe, they found they got as much water at the pumps as before it was closed, and they took it out and put in an iron pipe. Now then, what happened? The same water had been going from up above that intake to Hull for 25 or 30 years, there had never been an epidemic in that city and there was no evidence from the number of deaths in the town that there was such a thing as pollution, while in Ottawa we only had eleven, or fifteen deaths from typhoid in the city in a year, and some of those people came from rural places, outside towns, summer resorts and other places. In 1911, in January there was a sudden pollution, but we know the reason; a valve in the aqueduct was opened in order to get enough water for the fire in the Inland Revenue building and immediately there was gross pollution and you got an epidemic. Last summer it was exactly the same way, when in the dry weather everybody was putting more water on the lawns, and there was a great consumption of water in the city, the pressure outward on the pipe ceased, and the joints at the various piers probably began to suck, and admitted the water, the pipe being unable to stand the pressure when they put the pumps more rapidly at work in order to increase the supply. That was last July. Now then, eliminating that gross pollution, you have this great dilution of the sewage in daily operation and the record is that the people of the city of Hull have taken their water supply from the Ottawa river for 25 years and there is no evidence of pollution from the epidemic standpoint. This spring you all saw the excited condition of the people in Ottawa, because we were putting 100 pounds of hypochlorite into each million gallons of water. Hull was taking its water from the same river and was not putting any hypochlorite into it and yet their town did not have one case of typhoid, so far as I know during that period.

Q. Just a few?—A. Just a few, but they may have come from anywhere. Now then, the point is, can we depend upon that situation owing to the great dilution of the sewage in that large body of water? So far it is quite clear we can.

*By the Chairman:*

Q. Just excuse me breaking in there; if I understand your argument it is that the sewage put into the river at Aylmer practically does not injure the city of Ottawa?—A. I say it has not.

Q. Well now, if that be the case; how do you account for the epidemic at Hawkesbury last winter? Dr. McCullough, of Ontario, whom you know very well, blames that outbreak to sewage from the city of Ottawa, and that town is sixty miles away.—A. In reply I may say this that after 33 years observation of our own outbreak and of outbreaks in the United States and in England I know of no evidence to show that with anything like the dilution that has necessarily gone on in the Ottawa river, with the sedimentation that has gone on, and with the rapid destruction of the bacteria, bacillus coli and bacillus typhosus in a medium foreign to them, that is water, I have no evidence to show me at all that any epidemic that has occurred during that period has been caused by pollution reduced to the extent the evidence shows the Ottawa does.