

If repair and maintenance work is done so much the better.

It will generally be found that in a comparatively small works the youth's ability will be more fully utilized, the necessity for quickness and accuracy more quickly brought home to him, and he will also have the advantage of being more directly under the eye of the master.

As against this view, it is often considered that training with a well-known firm more than counterbalances the advantages obtainable in a small general workshop, and it must be admitted that training in a great works, especially if followed by a pupilage or subsequent experience in one of the best offices, is still looked upon as a good introduction to the profession, particularly for those desirous of taking up work of a public character.

For the youth who does not propose to remain in the workshop it is not, I think, so necessary that he should learn to equal the workman in his knowledge and ability to execute any one class of work as that he should acquire an intelligent knowledge of the processes and methods of treatment of the various metals and other engineering materials.

Perhaps of greater importance than anything else is the ability to form a correct opinion of the capability of the men in a workshop, a knowledge of their methods of thought and work, a study of the systems adopted to get work pushed through to completion, and generally such knowledge as will enable him to handle men advantageously when occasion requires."

**SOME EXTRACTS FROM THE REPORT ON THE EPIDEMIC OF TYPHOID FEVER IN THE CITY OF OTTAWA, ONT., 1911.**

The City of Ottawa, Ont., the seat of the Federal Government, was visited in the opening months of the present year with an epidemic of typhoid fever, which for devastation and destruction of human life has probably never been equalled in the history of Canada.

The immediate cause of the epidemic was the pollution of the drinking water supply from infectious matter, chiefly sewage, which was carried into the intake from the south shore of the river. Ottawa's water supply is equipped with an emergency valve, which was opened quite frequently. It was through this, and very probably through the joints of the intake, that the water was inoculated.

The Ottawa River at many points above the city receive the raw sewage from many smaller municipalities.

The object of the report and investigation was to determine the cause of the outbreak.

An epidemiologic study of several cases was made.

A sanitary survey of the premises where cases had been reported.

A sanitary survey of the north shore of the river.

A sanitary survey of the south shore of the river.

A study of the city's milk supply.

An enquiry into the sewerage system.

An enquiry into the waterworks system.

An examination of the plumbing in some of the infected houses.

A study of meteorological and other climatic conditions.

The cases by the month, as reported, might be arranged as:—

December 1910 .....	10
January 1911 .....	382
February 1911 .....	454
March 1911 .....	65
<b>Total .....</b>	<b>911</b>

After the investigation had commenced work it was brought to the attention of the commissioners that certain unsanitary conditions existed in respect to the disposal of typhoid excreta in some of the homes, which was regarded as a menace to public health.

In every instance the diagnosis as made by the attending physician was accepted.

The inspection of the premises of the individual milk vendors showed that the precautions taken to immune milk from contamination were somewhat open to criticism. In one case a dark underground, badly lighted, unventilated cellar, without either a wooden or a concrete floor, with an open drain was used for dairy purposes.

The normal water supply as derived from the river cannot be regarded as the immediate cause of the outbreak.

The City of Hull, P.Q., receives its water supply from the river at a point 3,000 ft. distant from the Ottawa intake. The City of Hull was practically free from typhoid fever while the epidemic was severe in Ottawa.

The unsanitary conditions which effected the water from which Ottawa was being supplied previous to the outbreak were:—

- (1) The unusually low water in the river.
- (2) The low temperature which allowed the water to freeze to the bottom, in many cases thereby blocking some of the channels.
- (3) The occurrence of typhoid fever in some municipalities above the city in the autumn preceding the outbreak.

The opening of the emergency valve at Pier No. 1.

The pollution of the old aqueduct by sewage.

The possibility of contamination while the water was in passage through the intake pipe.

The neglect to carry out a suggestion to apply hypochlorite treatment.

The cause of the continuance of the epidemic was, in the main, due to a continued contaminated water supply.

After steps had been taken to apply the hypochlorite treatment, which was in full effect by the latter portion of February 1911, there was a marked decrease in the number of cases.

No doubt many secondary causes were operative after the epidemic had made a foothold on the community, such as personal contact, the washing of uncooked food stuffs, and household utensils in the infected water, also the defective plumbing and general unsanitary conditions which existed in many premises.

**PROPORTIONS OF CONCRETE MATERIALS.**

Engineers frequently have occasion, in ordering material for concrete, to estimate the quantities of various materials needed. The following table is sufficiently accurate for all ordinary purposes and gives the amount of the various materials needed per yard of concrete:—

Mixture	Cement Barrels.	Sand (Cu. Yds.)	Stone (Cu. Yds.)
1-2-3	1.83	0.51	0.77
1-2-4	1.57	0.44	0.88
1-2½-5	1.29	0.45	0.91
1-3-5	1.22	0.51	0.86
1-3-6	1.10	0.46	0.93