

alteration of the same will be allowed except on a written application of the owner, or of the agent of the owner, to the City Engineer.

(8). (a) Each house or building must have its own separate soil pipe and drain, and such soil pipe or drain shall be so placed as to be always readily inspected without excavation or destruction to walls or floors, and the Plumber shall be responsible for the proper connection of his work with the system of drainage, which connection shall be made by a cast iron bend and three feet of pipe from the vertical soil pipe; and no two or more houses or buildings shall have drain in common until each separate drain shall have passed outside the walls of the house or building which it serves. (b). No pan closets shall be fitted up or used in any building, and no closet or other convenience which allows the escape into the house of air or gas which has been confined in any part of it, or from the drain or soil pipe, or which allows the accumulation of filth in or about it shall be fitted or used. (c). Every connection between lead and iron pipes shall be made with brass thimbles or ferrules having properly wiped joints, and the ferrules shall be properly gasketed, leaded and caulked into the said pipe. Ferrules for four inch pipes shall weigh not less than 2½ lbs., for three inch pipes not less than 1½ lbs., and for two inch pipes not less than 1½ lbs., each ferrule not to be less than four inches in length. (d). All water supplies within a house or building must be graded down to a stop and waste cock, which is to be placed just inside the outer wall of the building or cellar. (e). The Inspector must be satisfied that all water pipes are laid with due regard to freedom from danger of freezing, and every service pipe must be provided with a stop and waste cock for each consumer, easily accessible, placed so as not to be endangered by frost and so situated that the water can be conveniently shut off and drained from the pipes.

(9). All work done by licensed plumbers shall be subject to the inspection, supervision and approval of the City Engineer, Medical Health Officer, or Inspector appointed by the Corporation of the City of Toronto for that purpose, and all faulty or defective work which may at any time be discovered shall be made satisfactory to the said City Engineer, Medical Health Officer or Inspector, as the case may be.

(10). Any plumber whose license shall be declared forfeited by the City Engineer for a violation of any provisions of this or any other By-law relating to drainage, plumbing, sanitary matters, or the Toronto Water Works and the supply of water to the City of Toronto, shall not again be entitled to a license until the said declaration of forfeiture shall be revoked by the City Engineer.

(11). The City Engineer, Medical Health Officer, or any Inspector appointed for that purpose, shall have the right, and they are each and every of them is hereby authorized and empowered to enter upon and into any premises at all reasonable hours, and from time to time, as the occasion may require, for the purpose of enforcing compliance with the provisions of this or any other By-law, Rule or Regulation which may at any time be in force in the City of Toronto respecting the Toronto Water Works, licensing and regulating plumbers and plumbing, sanitary and drainage matters.

(12). The Council of the Corporation of the City of Toronto shall from time to time, as occasion may require, on the nomination of the Local Board of Health, appoint such and so many Inspectors of Plumbing as may be found necessary, but no person shall be eligible to such appointment who shall not have passed a satisfactory examination for proficiency in both the practice and theory of plumbing and draining, before a Board of Examiners consisting of the said City Engineer, Medical Health Officer, two practical master plumbers in good standing in Toronto, to be chosen by the Master Plumbers' Association, and an architect or sanitary engineer, to be chosen by the Sanitary Association of Toronto, to hold office for one year.

(13). Any candidate for a plumber's license shall be examined before and by the Board of Examiners named in the preceding section of this By-law, and their certificate, or the certificate of a majority of them, shall determine the right of the candidate to a license.

(14). That any person or persons guilty of an infraction of any of the provisions of this By-law shall, upon conviction before the Mayor, Police Magistrate, or any Justice or Justices of the Peace for the City of Toronto, on the oath or affirmation of any credible witness, forfeit and pay, at the discretion of the said Mayor, Police Magistrate, Justice or Justices convicting, a penalty not exceeding the sum of fifty dollars for each offence, together with the costs of prosecution; and in default of payment thereof forthwith, it shall and may be lawful for the Mayor, Police Magistrate, or Justice convicting as

foresaid, to issue a warrant under his hand and seal; or in case the said Mayor, Police Magistrate, Justice or Justices, or any two or more of them, are acting together therein, then under the hand and seal of one of them to levy the said penalty and costs, or costs only, by distress and sale of the offender's or offenders' goods and chattels; and in case of no sufficient distress to satisfy the said penalty and costs, it shall and may be lawful for the Mayor, Police Magistrate, Justice or Justices convicting as aforesaid, to commit the offender or offenders to the Common Jail of the said City of Toronto, with or without hard labor, for any period not exceeding six calendar months, unless the said penalty and costs be sooner paid.

INTERESTING EXPERIMENTS WITH TYPHOID GERMS.

THE village of Iron Mountain, Michigan, was last summer ravaged by typhoid fever, epidemic in its nature. It was suspected that impure drinking water was the cause of the trouble, and to settle this point a sample of the water was sent to Dr. Vaughn, of the School of Hygiene, at the State University, for an analysis. The epidemic was so severe that 350 cases were reported, first and last, and 35 deaths. One part of the town has a public water supply and escaped the scourge, but the other part, whose inhabitants are supplied with water from shallow wells of from 6 to 20 feet in depth, was sorely visited by the disease. The examinations of Dr. Vaughn led to the conclusive discovery of germs in the water capable of producing typhoid fever. The doctor inoculated sterilized meat preparations and sterilized milk with the well water, and kept the preparation at the temperature of the body for seven days. During this time the germ developed in both the meat and the milk.

He then resorted to a further experiment, which is said to be the first of its kind, and which may prove to be of the greatest possible interest and value. Taking some of these typhoid germs, the doctor inoculated several cats with them, and in each case a disease similar to typhoid fever was developed, thus apparently establishing the certainty of the source of the epidemic and also the possibility of using the lower animals to trace such a disease back to its cause. In a report covering these interesting facts, just made to the State Board of Health, Dr. Vaughn says that there are annually in Michigan 1,000 deaths and 10,000 cases of sickness from typhoid fever, adding his conviction that nearly all this may be prevented if the people will only stop polluting the soil and the water. He adds some other important practical conclusions. A succession of freezing and thawing may ultimately result in the destruction of the typhoid germs in the water, but it matters not how cold the winter may be if there is not a continued succession of freezing and thawing the typhoid germ will not be affected. The same is true with regard to ice formed on impure water. The poisonous germs will be preserved intact to do their deadly work the moment the ice is brought into use. As in so many cases typhoid fever arises from the use of impure water and impurely diluted milk, the doctor recommends, where any doubt exists as to the purity of the water, that it should always be boiled.

The Port Arthur Water and Light Company has recently been incorporated.

The city authorities of Winnipeg propose to extend the city sewers and provide for the proper flushing of them.

The Board of Health of Quebec province report that during the year 1887 not a single case of small-pox appeared in the province.

Stratford is discussing the electric light. A proposition has been made to buy a Royal plant at a cost of \$10,000, to run fifty lamps.

Cholera has broken out in some of the South American ports. Our quarantine officials will doubtless keep a careful look-out in that direction.

A committee appointed by the Ontario Provincial Board of Health has reported that the recent fever epidemic at Ottawa was caused by the use of river water of inferior quality.

The Goderich local papers are calling on the town authorities to take measures for preventing the spread of infectious diseases, in view of the prevalence of diphtheria in the town lately.

It will be remembered that last year Sir Donald Smith and Sir George Stephen gave half a million dollars apiece towards the erection of a public hospital in Montreal. The city thereupon gave a site for the building at the foot of the mountain, above the reservoir. The Local Board of Health has decided to ask the Council to get the opinion of a scientific commission as

to whether the city water supply would be likely to be affected by the nearness of the hospital.

The Drain Inspector of Montreal says that housekeepers should not think so hardly of draughty, cool houses in winter. He believes that many people are saved from sickness in badly drained houses owing to unremediated ventilation. "Often and often," said Mr. Lowe, "the house we would consider the warmest, best and nicest fixed is the one where sickness stays longest owing to the imperfect drainage. There is nothing like ventilation. Housekeepers, too, do not pay sufficient attention to the sinks. Closed sinks get especially dirty, and prove little hotbeds of disease."

A system of steam heating for railway cars is said to be in successful operation on the Canada Atlantic Railway. It is known as the Sewall system, and consists of a main pipe with radiators in the cars. Heating is supplied by the engine; and provision is also made for supplying heat, independent of the engine, in case of a car being side tracked or waiting at junctions for incoming trains, or in event of accident interrupting the connection with the main supply of steam. In such cases heating steam is supplied from a small boiler in each car, that receives the drip of condensed water from the pipes, having a small fire box under it.

The proceedings of the second annual meeting of the Association of Executive Health Officers of Ontario, just closed in this city, were of a most interesting and profitable character. The programme included reports of committees on "House and Land Drainage and Disposal of Sewage"; "Ventilation of Houses, Schools and Public Halls"; "Food, its Adulteration and Unwholesome Supply"; "Milk Supply, its Sources and Contamination"; "Water Supplies and their Contamination"; "Removal of Night Soil and Garbage"; "Control and Prevention of Disease"; "Dangerous and Unhealthy Occupations"; "Sanitary Legislation." Instructive and valuable papers were read on "Methods of Dealing with City Sewage," by P. Drayton, Chairman Local Board of Health, Toronto; "Recent Methods in Milk Analysis," by N. B. Nesbitt, B.A. M.D., Toronto; "The Duty of the State in Investigating the Causes of Disease," by Prof. Victor C. Vaughan, of the Laboratory of Hygiene, Ann Arbor, Mich.; "Methods of Biological Analysis of Drinking Water," by Prof. Ramsay Wright, M.A., University College, Toronto; "Compensation of Health Officers," by Francis Rae, M.D., Chairman Provincial Board of Health; "Cremation of Town Refuse," by Prof. W. Oldright, M.A. M.D., University Medical Faculty, Toronto; "Condition of Factories in Ontario," by J. R. Brown, Inspector under the Factories Act. We may have more to say regarding the work done at this convention in our March number.

WHAT CONSTITUTES JUDICIOUS ADVERTISING?

AS to the advantages of judicious advertising, most business men are agreed; but judging from the vast amount of money wasted annually by advertisers, the methods of judicious advertising are but very imperfectly understood. The following extract from an article in the *Toronto Saturday Night*, on "Advertising as a Fine Art," is in accord with common sense, as well as the experience of successful advertisers. Our contemporary says:

"Promiscuous advertising is most injudicious. A man who wants to express goods to a certain town will not ship them over half-a-dozen roundabout roads. He will send them by the most direct route, get them to his patrons quicker and save himself annoyance and expense. It is practically the same in advertising, although the only-tongued advertising agents who flood the country and earn a precarious living by assurance and gab, would endeavor to convince the advertiser that all roads lead to Rome. It is a mistake to suppose that advertising in a paper with a large circulation is necessarily judicious advertising. No greater error could be made. I spoke a while back of the wholesale grocer and his advertisement in the widely-circulated daily as compared with the same advertisement in a trade paper. The same illustration answers here. The trade paper may not have the circulation of the daily, but IT GETS TO THE PEOPLE THE ADVERTISER WANTS TO REACH, which is all he wants, while he saves the percentage of money he would have to spend to put his advertisement before those readers of the daily not affected by it, and who are consequently of no use to him. If he desires to reach a thousand people in a certain walk in life, it is cheaper for him to utilize the columns of a paper that goes to those thousand people and no others, than it is to pay five or six times more for the use of a paper which only reaches about half the people he is anxious to appeal to, although its outside circulation may amount to forty thousand."