

## SEWAGE DISPOSAL.\*

By J. Darlington Whitmore.

In preparing this paper on Sewage Disposal, I have not considered it necessary to review all the various methods now adopted, but have confined my remarks to that method which seems most applicable to our province and peculiar local conditions, and as this is a maiden paper for a maiden society I must ask your forbearance for any maidenly coyness that may permeate the following lines.

Sewage disposal methods rightly commence on the property of the producer, and I therefore propose to glance lightly over an imaginary scheme, commencing at an imaginary household and following the sewage to its reception and treatment at the disposal works.

I shall not in this present paper deal with other than water borne sewage; the outside closet and privy, etc., together with the objectionable methods of emptying and cleansing same, being thoroughly familiar to us all.

As you are all no doubt aware, the close of the year 1909 saw the ratification of a very excellent Public Health Act for this province, patterned largely upon the laws and regulations enforced by the various local government boards of Great Britain, and controlling the methods of sewage disposal and water supply, as also the pollution of streams and waterways.

The authority is vested in a "Bureau of Health" acting for the government and having a duly qualified medical man at its head as commissioner, who in turn has a sanitary engineer on his staff to advise with him on the various questions that arise.

No scheme for water supply, sewage disposal or sewerage can now be constructed in this province without the sanction of this body, and as time passes and the various plants now completed or under construction come into use, much valuable information will be obtained, and a careful record of regular tests and analyses at the various works will further enlarge our knowledge of this subject and enable us to take a seat in the forefront in the vexed question of the efficient and sanitary disposal of sewage.

**Plumbing.**—Commencing with the household, our first step in connection with sewage disposal is to install satisfactory plumbing whereby the liquid wastes and faecal matters are quickly passed away into the sewers without causing any nuisance to the occupiers of the premises.

It has been abundantly proved that, where perfect ventilation in the plumbing system does not exist, the foul gases generated by the sewage and ever present in the pipes will force their way through the water seal of the traps to the interior of the dwelling with a consequence of disease and sometimes death to those persons inhaling the impure mixture.

It is, therefore, absolutely necessary to arrange for perfect ventilation to the whole system and in each case all traps should be back vented with efficient vent pipes and every fixture should be trapped.

The system in vogue for many years, of placing an intercepting trap on each individual system, thereby separating the house plumbing from the sewers, has not borne out the expectations conceived for it and the majority of new systems being or to be installed will be without this fixture.

The idea governing the adoption of the intercepting trap was to exclude sewer gases in the main sewers from rising

into habited premises and also to prevent the ingress of rodents; each separate plumbing system was then vented on the house side of the intercepting trap, and it was for a long time considered that the acme of plumbing ventilation had been achieved.

A short vent pipe was connected with the house system close to the intercepting trap, generally in a manhole, whilst the main soil pipe was continued up above the roof; the idea being that the short pipe would always act as an inlet and the long one as an outlet.

This theory was, however, soon exploded, it being discovered that both long and short pipes acted alternately as inlet and outlet, depending upon changes of wind, temperature, etc., and, as the short pipe was always at the lower end of the system, extremely foul odors were often discharged at most dangerous points to passing pedestrians, and, where open windows or doors were near the supposed inlet, the malicious influence of the sewer air soon became only too well manifest.

To overcome these difficulties at the supposed inlet end various valves were made, the chief kind being fitted with a mica flap to allow air to enter from outside but to prevent foul air emanating from within; the success attending the adoption of these expedients was but meagre and unsatisfactory and the adoption of this system cannot be recommended.

Personally I consider that efficient plumbing in the interior of dwellings should be as follows: The soil, waste and vent pipes should be of iron, with the caulked lead joint, all fixtures such as baths, sinks, closets, grease traps, etc., should be of porcelain, and through ventilation with the main sewers be always acting; all traps to all fixtures being vented into either a separate anti-syphonage pipe or into the main soil pipe well above the highest fixture; further, the soil pipe should be carried up well above the ridge of the roof and should discharge clear of all chimneys or open windows.

To be certain of satisfactory and air-tight joints in the plumbing at least two tests are necessary, the hydraulic and smoke test. The hydraulic or roughing in test is applied before the fixtures are installed; the pipes including soil, waste and vents being filled with water and allowed to stand a reasonable time; after this test is satisfactorily accomplished and any faults made good, the fixtures are placed, and a smoke test of sufficient pressure so as just not to break the trap seals is further applied; the plumbing after satisfactorily passing these two tests being ready for use.

**Sewers.**—The sewers can be of either concrete, vitrified tile, vitrified brick or other impervious and smooth construction, and should be so designed as to grade and size as to be self-cleansing.

The velocities of the sewage through the sewers should range from two to six feet per second when flowing half full, and wherever possible should flow by gravity without the aid of pumping.

Where, owing to the topography of the ground, lifting is necessary, it can be accomplished either by some of the various pneumatic devices now on the market or by centrifugal pumps; reciprocating or plunger pumps are not satisfactory for this purpose owing to the excessive wear on the valves and pistons, etc.

In this province the tendency is towards the separate system; the storm water being carried in separate pipes, the advantage of the separate system being that the disposal works can be designed to deal with a known quantity of sewage, and much of the expense and uncertainty attaching to combined systems is thus eliminated.

The ventilation of the sewers is an important feature and should be achieved by through ventilation with all house or

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