

# The Canadian Engineer

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## THE MODERN METHOD OF SEWER VENTILATION

OUTLINE OF ESSENTIAL FEATURES OF THE MOST POPULAR SYSTEM—  
IMPORTANT CONSIDERATIONS TO GOVERN STORM AND DRY WEATHER FLOW.

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**T**HE modern method of sewer ventilation consists of numerous openings to the sewers from the atmosphere. This system has met with great success in Germany and in the United States of America, as it promotes an ample circulation of fresh air in the sewers.

This system is the direct opposite of that in which the circulation of air or the ventilation is promoted by using, artificially, individual factors as motive powers for the process, as it favors the co-operation of all the factors which have any influence on ventilation by a continual motion in all parts of the sewerage system through numerous openings, and the resulting continuous circulation of air tends to restrict the formation of obnoxious gases.

If the sewerage system is properly designed and constructed with grades sufficient to ensure a self-cleansing velocity, the sewage will always be in a fresh condition, and thus the generation of gases would be reduced to a minimum, for in spite of the best designed systems there will be, to a certain extent, a small deposit of sewage adhering to the walls of the sewers caused by the constant fluctuation of the flow and with it the generation of gas, but by proper ventilation this danger is overcome, as the oxygen contained in the atmosphere destroys all substances adhering to the walls or otherwise deposited in the sewers by oxidation, thus by the strong dilution of the sewer air with the fresh air the nuisances caused by sewer gases are avoided.

This system of ventilation consists of the installation of two groups of connections between the sewer and the atmosphere, the one at the lowest possible point (such as the openings in manhole covers) and the other at the highest possible point (such as the rain water and soil pipes on houses). The differences in the levels of inlet (the lowest point) and outlet (the highest point) form the main movement of the current of air.

First we will consider the high level group. If the down pipes are connected directly to the sewer, that is without any trap, there would be created a series of highly located connections with the atmosphere, which, in combination with the manhole orifices, would present favorable conditions for the forming of such a considerable difference in levels. To produce an upward current in the down pipes, it is necessary to have a source of heat so that the air in these pipes would exceed the temperature of the atmosphere. In cold weather the source of heat is promoted from heated buildings, and a very small excess of temperature is necessary to promote a velocity sufficient

to influence the process of ventilation. Even in winter the co-operation of these down pipes can be relied on for the circulation. In summer the conditions are much more favorable, as are also those times during the action of the sun's rays.

This system of ventilation is much more efficient in streets which are located east and west, and the efficiency extends annually to 2216.2 hours or 25% of the year.

In times of storm, the upward current is eliminated. This condition has often been cited against the use of down pipes for the purpose of the ventilation of public sewers, but when it is considered that the rain duration is only 518 hours annually, or 6% of the total, and the sewers during rain are cleansed by the indraught of air, there is no reason why this should be considered seriously, especially when we consider that this system requires no artificial assistance and, therefore, no expense. However, in residential districts, or in houses where the attics are used for dwelling purposes, it is not advisable to use the down pipes for the purposes of ventilation, so that only the soil pipes could be used.

The pipes most suited for ventilation are those in proximity to the furnace or kitchen chimneys, as the surroundings during the whole of the year have a heat exceeding that of the sewer air, and correctly, soil pipes have been termed the "natural chimneys of ventilation."

The temperature always being higher in the soil pipes causes the motion of the air, and if these pipes were extended to a height above the roof, either of the same or larger diameter, they would form a perfect means of maintaining the continuous current of air from the manhole inlets through the sewers into the atmosphere, and even in times of storm their efficiency is not impaired if a protecting cowl is provided to prevent the admission of rain or air attracted by rain. (Fig. 1.) In draughty locations, the efficiency of these pipes as a means of ventilation may be increased by providing a revolving cowl, but if this is provided, provision must also be made to protect the house traps from their seal being broken, which is done by secondary ventilating pipes. Experiments were made in Cologne by Dr. Unna\* with the revolving cowl without protection to the house traps, when it was found that the seal was broken.

In reference to the irregularity of the direction of the current, this is governed by local conditions. Frequently there are special conduits for sinks and bath waste which also partake in the process of ventilation. If these are

\*Gesundheits-Ing., 1898, 21 Jahrg., No. 4 and No. 5.