

that in so doing I am departing from the more natural order of my subject.

It has been well remarked that "unventilated sewers are more dangerous than steam-boilers without safety valves;" and yet how very little attention do we find given to this matter; and into what obloquy does this neglect sometimes throw the whole matter of sewerage:—witness the extract we have quoted from "*La France Medicale*:" In an English town typhoid fever broke out in one of a row of houses; some houses of the row were connected with a common drain, others were not. In all of the houses so connected the fever broke out, in the others it did not. This was looked upon as a conclusive practical argument against sewers, instead of being considered as an argument for having them so constructed that air laden with the emanations from one cannot blow through the others either into adjoining or remote houses; for it is found that with an unventilated system of sewerage, the higher, and once more healthy, districts of a city become the more pestilential.

Some noxious forms of sewer gas are not *always* to be detected by the nose, and hence are more subtle in their action. Among the gases more commonly evolved from sewers, I may mention sulphuretted hydrogen, carbonic acid, carburetted hydrogen, nitrogen and ammonia.

The *causes* operating in the evolution of sewer gas, besides those operating more generally, such as the natural *diffusion of gases*, are:—

1. *Difference of temperature* between sewer and external air, causing a rapid interchange under the laws of diffusion of unequal weights of air.

2. *Upward draught* in houses (caused in this way) acts as a ventilating shaft, in the wake of which the sewer air will follow if allowed.

3. The *expansion force* created by the sudden accession of heat in the drain. viz., by pouring down hot soap suds or boiling water. Air expands 1-491 of its bulk for each degree of heat. If then the temperature of the air in the drain be raised from 50° to 150° the result would be a pressure of 6 7-10 ft. head of water, enough you will see to force any trap, unless some other means be provided for its escape. And this raise of temperature is not at all an improbable one.

4. The *ebb and flow* of water in the drain is in itself an expulsive force. When water is poured into a drain it must, of course, displace its own bulk of air, (less the small amount