

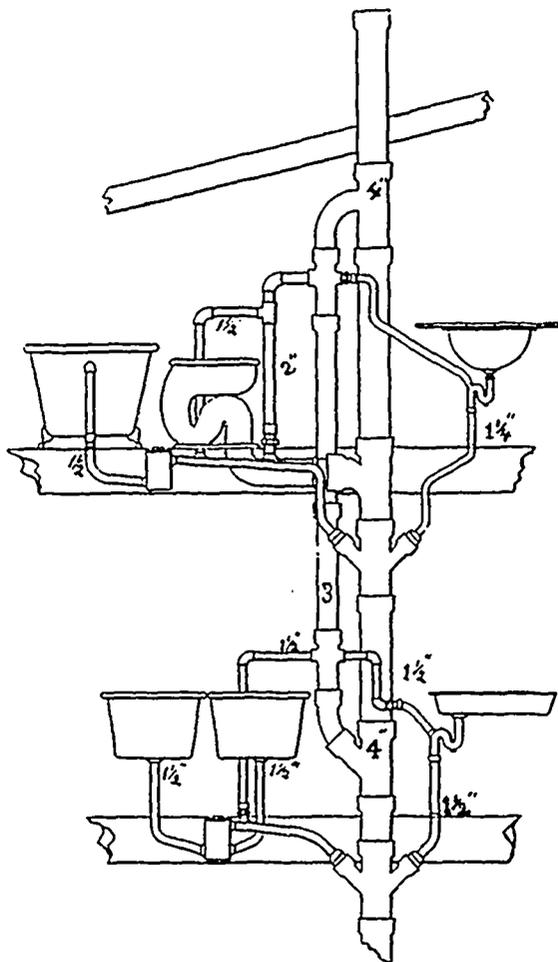
itants living in houses having the interception trap on their drains, and similar houses that have not, so that the public would be enabled to judge for themselves whether or not it is a dangerous innovation. Though this would only show a small part of the danger and the injury done, because the whole sewage system of the town is fouled for the want of the ventilation which the interception trap prohibits.

The introduction of the interception trap has given sanitary theorists a large field wherein they have introduced many kinds of machines to try and aerate the drains, and flush the sluggish sewers, and by so doing prevent the generating of foul gases, but at every point they have met with poor success, and many of the public streets are charged with foul odors coming from the sewer manholes, and people living in elevated places where the town sewer gas is driven have often to suffer contagious illnesses, simply because the town sewers are not ventilated by natural principles, or in other words let me say that nature is not allowed to perform her appointed duty; if it was, then the making of obstructions in the flow of sewage and sewage aeration would cease. Sewage ventilation would be fully secured by using the simple and natural means that is at hand when the interception trap is left out. To do this all private drains must be inserted in the crown of the street sewer, and continue on a rising grade free from any obstruction until the line arrives above the roof of the building, and all the waste pipes of all the conveniences on the premises must be connected with the vertical soil pipe separately by a short branch and trap.

There are more injurious excesses and unscientific obstructions placed in the sewage and plumbing appliances at the present period, than I have ever witnessed during my forty years' experience, and these excesses are as expensive as they are useless, and many of them are dangerous to the public health.

Fads being catching it is only the excessive cost that has prevented many councils from destroying their present system of ventilation by compelling their townspeople to adopt the interception trap principle in their house drains. To show the excess that plumbing has arrived at I ask the reader to study a drawing of R. M. Starbuck's, published in *The Sanitary Journal* of New York, which is a fair drawing, showing how plumbing must be put together in many cities and towns which consider their sanitary business the acme of perfection. The drawing shows at least twice the amount of pipes and joints that are necessary to make safe and first-class sanitary jobs that will work freely. It also shows the waste pipes from the conveniences to be arranged and carried out to the soil pipe connection in a way that cannot meet with approval of an expert experienced plumber. There is too much pipe used, and it is not well arranged. I gave sketches, and the reasons for making this remark in my article on plumbing in February issue of 1899 and September issue, 1898; these two articles give detail reasons for several assertions made in this paper. The 3-inch main line ventilation pipe shown to be joined by a branch to the 4-inch soil pipe near the washtubs, and again at a point just under the roof, cannot have any circulation of air, for no current passing up the soil-pipe can be made to branch off and return into the soil-pipe again without the use of force. It is possible to turn the air round the 3-inch by-pass,

by placing a stop valve in the 4-inch soil pipe, somewhere between the two 3-inch branches, but by no other natural way, so we can safely say that the so-called 3-inch ventilation pipe, together with its five branches that lead to the five different conveniences, are no ventilation pipes at all. The only office they can perform is to form a relief, so that when the contents of the pipes contract or expand they will throw out, or take in the small quantity of air needed to balance the space.



But there is another duty that they are credited with performing, viz., they prevent the key of water (that forms the air valve in all traps), from being syphoned out. When plumbers arrange the waste pipes from the bath and sinks in the way they are shown in this sketch, they do their level best to coax the traps that serve the fixtures to be syphoned, but there are reasons why they never do syphon, when used in the usual domestic way, they never did syphon nor they never will, but if the waste pipes were connected to the soil pipe in a proper mechanical way, they could not be syphoned, if every pipe, including the soil pipe, was running full bore at one flush, which is an action that can never happen in the usual way of using them. Experiments have been repeatedly made, and the results have shown that such vent pipes are no use, but on the other hand do much harm, and are responsible for many premature deaths; this, too, has been personally proved.

The oldest plumber never found a trap on a house pipe dried out by evaporation before the fad of venting all traps was introduced, because the drying influence of the atmosphere on the house side of the trap was balanced by the condensing of the sewer air and moisture present on the sewer side of the same trap. When a vent pipe is connected to the sewer side of the trap it