

POTOMAC WATER LEAD-PIPES.

To the Editors of the *National Intelligencer* :

"The advent of a supply of water to our city conveyed by pipes had to some minds suggested the necessity of considering the suitable material from which service-pipes should be made, and objection having been raised to the use of lead as the proper metal, I have taken the liberty of placing a few facts in connexion therewith before the notice of the public.

In the year 1853, in Paris, the Minister of Agriculture and Commerce issued a letter to the Prefects forbidding in breweries and liquor stores the use of lead, copper, or zinc pipes, and cites as examples the numerous cases of poisoning arising from the employment of such pipes to convey liquors capable of fermentation. The circular also alludes to the accidental poisoning of water at Claremont, where the Orleans family suffered, and the statements and authority of Chevalier as to the danger arising from the contact of water with lead. To obviate this inconvenience, the Minister only allowed for such usage tin pipes, which do not contain more than 16 per cent. of lead, or pipes of any other unoffensive matter. One might ask, if the Minister had a real consideration for the public, would it not be better to get rid of lead totally, rather than expose them to the least danger from lead by alloying the tin with it?

But, it may be asked, what are the materials from which pipes may be made which are inoffensive, and not subject to grave objections to their practical use?

In 1853 Dr. W. H. Ellett, of New York, published some letters on the effect of Croton water on lead-pipes, and his recommendation to use tin pipes instead. The Cochituate water has had the same effect of acting on the lead-pipes, and my own experience of the western part of Massachusetts is that every where lead pipe was laid to convey spring water to houses symptoms of lead poison showed themselves, and the water was always darkened on the addition of sulphuretted hydrogen. There is no doubt that lead-pipes are objectionable as means of transport for water, especially if the distance be great.

It is many years ago since Dr. Christian pointed out the circumstances under which the clean surface of lead-pipe was corroded by water, and with it pointed out the readiest means of remedy. He showed that it was pure water, soft water, or water containing alkaline salts as carbonates or chlorides, which acted on the lead; that hard water, containing lime or earth, in the form of sulphates and phosphates, did not sensibly attack the lead, or at least formed insoluble salts on the inner surface of the pipe, and thus saved the lead from any further corrosion; and to make a new lead-pipe serviceable it was only necessary to coat the inside with a deposit of sulphate of phosphate, which could be done in twenty four hours, and the injurious effect was no longer imminent; and in point of fact we know that practically old leaden pipes are safe conveyers of water where the nature of the water remains the same.

But, happily, the dangers which await us from the use of lead-pipe are not so immediate as they would be in New York or in the Eastern cities, where the water is derived from granitic or primary water-sheds. Potomac water is largely loaded with earthy salts, containing sufficient sulphate of lime to coat a fresh surface of pipe in a very short time. Of the safety of pipes so coated, when long in use, there was given a good instance in the examination of the water used (during the period of the epidemic) in the kitchen of the National Hotel for ordinary purposes, which was conveyed from the top of the house down through four stories, yet the water delivered did not contain a trace of lead in two quarts of water examined by me.

The effect of the circular of the Minister of Agriculture in France was to introduce tin pipes extensively into the streets of Paris as water conveyors; and the effect of Dr. Ellett's letters was to lead to the partial adoption of tin piping into hotels and houses in New York. But these have gradually disappeared, and are replaced by leaden pipes. Tin always bears too high a price to be a substitute, and unless made very strongly it will not resist the effect of the frosts of our winters, and when split it cannot be mended so readily as lead after rupture. Small iron pipes are still more inefficient, for they clog so readily with rust where the bore is small, and where there is the slightest bend for a lodgment. All organic materials, such as caoutchouc and gutta percha, are inadmissible from their nature, and there is not any material at present cheaply attainable which contains all the properties required in a conduit pipe of an inch diameter and downwards. Glass and earthenware are objectionable, as being too brittle, and the former containing lead; and yet I incline to believe that it is from the class of earthy or mixed silicates, either baked or fused, that future piping is to be obtained. In fact, we have not that material yet presented to us; and until it does appear there is nothing which can economically supplant the use of lead.

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