

# Is Lead as a Conduit for Water Detrimental to Health?

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*By Joseph P. Gallagher, of St. Louis.*

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We see here before us assembled in convention representative men from the east, from the west, from the north, from the south, who are engaged in one of the noblest works that has yet engaged the attention of man, namely, sanitary and scientific plumbing. No idle curiosity has caused this assemblage, this is a work for the benefit of the human family, and those who labor for humanity sake labor for no selfish end. For example, the subject matter assigned to the Master Plumbers Association of the city of St. Louis is one of more than ordinary importance to the whole plumbing profession.

*Question*—"Is Lead as a Conduit for Water Detrimental to Health?" This question is frequently asked, and for want of an intelligent reply from many of our fellow-craftsmen, much anxiety and needless expense has been incurred by persons of a nervous temperament, in the absence of any evidence that lead as a conduit for water is detrimental to health. And as this question has not been discussed by the plumbers who preceded us in the early part of the present century, if so, our researches fail to give us any data further back than comes within our own personal knowledge. Therefore our answer shall be from that standpoint with practical and personal experiments, beginning with the date, as near as possible, of the time and cause of the alarm in relation to lead as a conduit for water.

On the 14th day of November, 1842, the inauguration of the Croton water was celebrated in the city of New York, then but little more than a country town of the present day; the plumbing business being a branch but little known in this country, and there being no system of drainage at that time, water closets were put up and connected to cesspools in the yards, and, in many cases, these cesspools were made from old cisterns by removing the brick bottoms, and, in addition to this foul system of disposing of excrement, the plumbing was badly done, for in but few cases traps were used in connection with fixtures.

New diseases soon began to be developed, which baffled the skill of the

most eminent physicians of that early day, and as the water supply was a new thing, and lead pipes were exclusively used as a conduit, it was taken for granted by many of the physicians that the use of water conducted through lead pipes and used for culinary and drinking purposes was the cause of these mysterious maladies. Time, however, soon developed that bad drainage, or, more properly speaking, no drainage at all, was the cause; and while this lead pipe question was fresh in the minds of the people, a patent was obtained by David Smith, who was a member of the firm of Thos. Otis Leroy & Co., of 261 and 263 Water street, New York City, for the process of manufacturing pure block tin pipe. This firm, being influential and wealthy, soon obtained certificates from the most eminent physicians of the city, who were, no doubt, honest in their convictions as to the use of lead being unhealthy as a water conduit. These gentlemen recommended the use of block tin pipe as being the only safe conduit for water where used for family use, and we were uncharitable enough to remark, at the time, that it was destined to become more healthy, because it was manufactured by a rich firm who desired a monopoly in that line. Their hopes, however, were not realized, owing principally, to the great difficulty that was found in working; the block tin pipe has never come into general use in the plumbing profession. We never knew of but one house in the city of New York wherein all the service pipes were of block tin. This house was built in 1852, and No. 226 West Twenty-sixth street, between Sixth and Seventh avenues; and from this event dates our many practical experiments with lead pipes. Noting the effect of different kinds of water, and in different cities, also hard spring water, and in no case have we ever found a lead pipe corroded on the inner surface by any of the different kinds of water coming in contact with the lead, therefore we are prepared to state right here and now that we do not believe that water passing through block tin pipe, or any other metallic pipe, even if it were possible to use silver or gold, would be a particle more pure than the water passing through a lead pipe. We would not, however, recommend the use of water that had lain dead in any kind of a pipe for any length of time, as in cases where water has been turned off and lain dead in the pipes frequently for months. We would advise the emptying and cleansing of the pipes by letting the water run long enough to wash out all dead substances before using the water for culinary or drinking purposes.

We have found, in all our experiments with lead as a conduit for water, that there are certain forms of organic matter found in the waters of rivers and springs which coat the inner surface of the lead with an insoluble film, of sufficient thickness as to prevent the waters being acted upon by the lead; we have found this film to be the same in hard and soft waters; we have found this film so firmly attached to the pipe, and of such a thickness, as to form an inner lining, and to require the pipe to be heated and thoroughly dried before the film can be removed. We have frequently drawn pieces of perfect tubing, of from eight to twelve inches in length, thus leaving the inner surface of the pipe almost as bright as when first manufactured, thus showing conclusively that the water had not come in contact with the lead only a very short time

after the pipes had been put in place. We have in our possession specimens of pipe that have been in use five, ten, seventeen and twenty-four years in this city. We put these pipes in with our own hands; we also removed them; therefore, there is no doubt as to the time of their use. We find the film, or inner lining, to be about the same thickness in all the specimens, notwithstanding the difference in the time they have been in use.

We, therefore, have no hesitation in stating, here and now, that, after more than thirty-five years of practical and experimental experience as a master plumber, we believe lead pipe to be the safest and best conduit for water that has yet been *discovered*.

We must say, from all our researches on the subject of lead, that we believe lead to have been one of the first metals known or used. We find the word "plumbum" to be the Latin name of lead, hence, the plumber is a worker of lead, and not a fitter of iron pipes, like many of our present day saints.

We believe that when other material than lead is brought into use, the name of the plumber must necessarily become obsolete. In support of our argument as to lead having been one of the first metals known or used, we find in the seventh chapter of the Book of Amos, 7th and 8th verses, thus: "He showed me, and behold the Lord stood upon a wall made by a plumb-line, with a plumb-line in his hand; and the Lord said unto me: 'Amos, what seest thou?' And I said: 'A plumb-line.' Then said the Lord: 'Behold, I will set a plumb-line in the midst of my people Israel; I will not again pass them by any more.'"

Job refers to the use of lead for writing tablets 1491 years before the Christian era. Iron, tin and lead were enumerated by Ezekiel as among the commercial objects of the Tyrian trips to Tarshish. Ewbank relates that the terraces of Nebuchadnezzar's hanging gardens were covered with sheets of lead, soldered together, to retain moisture in the soil. We also find that the Romans used sheet-lead largely for the purpose of making water pipe; we also find that the plumbers of Pompei used lead pipes, for we are informed by Schiliman that bronze faucets were found in the ruins that had been buried four hundred years, and that the Neapolitan Government sold large quantities of lead pipes as old metal. These facts prove beyond a doubt that lead pipes have been used from the earliest ages as a conduit for water, and that plumbing is one of the earliest arts of which we have any record. The plumber, being a worker of lead, must necessarily have done the work at the gardens of Nebuchadnezzar; from these facts, of lead pipes having been used at so early a period, we must consider that plumbing was one of the lost arts, for we find that in 1539, A. D., Robert Broek is said to have been the first to invent making short lengths of pipe by the use of moulds, and that rolling and milling of lead is said to have been invented by Thos. Hale, A. D. 1670. These gentlemen may have been the discoverers of these arts, and resuscitated an art that had been lost, but could not possibly have been the original inventors, as lead pipe and sheet-lead had been used centuries before the time in which

these gentlemen lived. The first record we have of the manufacture of lead pipe by piston cylinder and press, as now in use, is in 1820.

We have gone over these early periods for the purpose of showing the length of time that lead has been in use as a conduit for water ; and no evidence adducible that it has been detrimental to health, and, in point of fact, there has been no such question asked before our own day and generation.

We know that lead is poisonous under certain conditions, especially so when it is corroded and its original substance destroyed by decomposition, as is the case in the manufacturing process of lead into white lead for paints and other purposes ; this same rule may be applied to all vegetable and animal substances ; when in a state of decomposition they are poisonous ; for example, take decomposed meat, its use would be almost certain death to the human family ; hence, the great necessity for meat inspectors to prevent unscrupulous meat-venders from spreading death and destruction throughout our land.

Another example may be seen by taking an observation of the methods of turning our cereal into alcohol by decomposition and distillation, this being a legal method of turning bread into poison, laying waste homes, and dishonoring every sacred thing, besides sending over sixty thousand victims, in the United States, annually, to their graves, poisoned by the use of alcoholic stimulants as a beverage ; yea, sending more victims to their graves in one year than have died from all the epidemics that have visited the United States since the Declaration of Independence.

We have often wondered why some Nemesis has not swept this nefarious traffic from the face of the earth.

And in the face of these facts, our humanitarians, sanitarians, and philanthropists, come to the front and ask the frivolous question : " Is Lead as a Conduit for Water Detrimental to Health ? " Our answer is given unequivocally : No ! We regard lead as being the best, safest and only material fit for a first-class job of plumbing, and cannot be made first-class with any other material, for the following reasons : First, lead is a soft and pliable metal, and is easily and quickly put in place by a skillful workman. Second, it can be manufactured to stand any pressure, from the lightest to the very heaviest. Third, it will last longer than any other material known to the plumbing profession. Fourth, it is easily, quickly and cheaply repaired, in case of bursting from frost, only requiring the removal of a small piece to put the work in thorough order, and at a trifling expense. Lead pipe is known to have been taken up after having been in use two hundred years, and was found to be of the same weight as when placed in the ground. This case occurred in Paris, France, and a perfect record has been kept, thus showing the exact time the pipes were in use. And now, gentlemen, let me ask if there is one among you who could wish to see a pipe last longer than two hundred years.

Thus, having given our views as to the health of lead as a conduit, also its lasting quality, it may not be out of place to state here that we require legal protection from the quack plumber as well as from the quack doctor, the former being much more dangerous than the latter, and to this end the master

plumbers of the city of St. Louis used every honorable means to have an ordinance passed to have practical plumbers appointed to inspect and test all plumbing work in buildings, and require the work to be done in accordance with the law governing the plumber as required by ordinance, and I will here state that this ordinance has hardly had a hearing, and proved to be an abortive attempt on the part of the master plumbers, and was looked upon in the light that the plumbers were trying to get up a corner in their profession. Instead of this, we were trying to inaugurate a thorough sanitary system of plumbing, and, to the lasting disgrace of the city of St. Louis, this ordinance died before it was born.

And, in conclusion, we would here, most emphatically, say that lead as a material is the only material that should be permitted to be used for any job plumbing, for first-class material of lead throughout, placed in the hands of a first-class workman, who has learned his business in the United States—we say the United States, because our varied experience with plumbers from all countries has long since taught us that the best plumbers, and the best plumbing work in the world, is to be found this day upon the American continent. And here, gentlemen, I will now submit the samples of pipe, marked exhibit A, B, C, D, with the time of use marked thereon, for inspection.

