The Plumber as a Health Expert

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Mr. Chairman and gentlemen of the Sanitary Engineering Association, it gives me a great deal of pleasure to be here this afternoon among the engineers and the plumbers, for the reason that I personally feel the plumber was the original health officer and that the foundations of preventative medicine and public health were founded upon the activities of the engineer and the plumber in the very beginning. So that basically the things we take for granted in public health are those things that the engineer and the plumber are responsible for.

In speaking of plumbing we are apt to forget its very ancient origin. The remains of extensive and well constructed sewers, dating from the time of the Assyrians, the eighth or ninth century, B.C., are still to be seen in the City of Nimrud. Similarly the great sewer of Rome, the Cloaca Maxima, is probably three thousand years old, and still in use. This year I was privileged to make a visit to the old country and in the ancient City of Bath, where a splendid Roman bath has been discovered in perfect preservation with the exception of the roof. I had pointed out to me some lead pipes rolled and welded by those ancient Roman plumbers, and here and there showing a perfect wiped joint that neither you nor any other plumbers could improve upon from the point of technical skill. Plumbing is surely an art, and nowadays indeed a science, that has been handed down from master to journeyman and apprentice through the ages, and many of its principles have reached us little changed from the original intent of the craft.

The magnificent engineering and plumbing triumphs of the time of the Greeks and Romans were, however, like all the other arts, swept away by the blight of the invading barbarians from the North who for a thousand years produced a desolation known as the Dark Ages. During that period plumbing was at its lowest ebb, and as far as household sanitation was concerned, ceased to exist. The Romans and Greeks, addicted to a high degree of personal hygiene and cleanliness, as well as a national love of physical development of the body, attained a constitution that apparently kept diseases and plagues at bay. In ancient histories we read only of such epidemics as existing among the barbarian or uncivilized hordes who lived beyond the borders of the then civilized Greek and Roman empires.

With the overthrow of the ancient civilization and the reversion of all the world into ignorance and chaos, arose those terrible visitations of epidemic diseases of plagues and pestilences that swept Europe and carried away millions of the unfortunate people. Ancient ideas of cleanliness and rules of health were forgotten or swallowed up in a mist of superstition and ignorance. Modern sanitation and sanitary engineering, as we know it today, is of quite recent origin. The first book written upon sewers was that of Baldwin Latham, published in 1873.

The real renaissance of sanitary engineering, however, occurred at an earlier date and was coincident with the distressful conditions found to exist in many of the large cities of England, as a result of the enormous influx of people from the country districts to towns in search of employment in the mills and factories and a higher standard of wages. It is very nearly impossible for us today to visualize what really existed in many millions of homes of the working people during the early and middle part of the Nineteenth Century, say 1825 to 1870. Writing of the outbreak of Cholera in London in 1866, Sir John Simon stated, "The diffusion of Cholera among us depends entirely upon the numberless filthy facilities which are allowed to exist and especially in our larger towns, for the fouling of earth, water and air, and thus secondarily for the infection of man with whatever contagion may be contained in the miscellaneous outflowings of the population. Excrement-sodden earth, excrement-reeking air, excrement-tainted water; these are for us the causes of Cholera."

In America things were no better. In 1864 the City Inspector ill New York reported that there were 6,000 families comprising 18,000 individuals living in underground cellars. "These dark, damp and dreary abodes," said Dr. Stephen Smith, "are seldom penetrated by a ray of sunshine or enlivened by a breath of fresh air. At high tide in the River the water often wells up through the floors, submerging them to a considerable depth. In very many cases the vaults of privies are situated on the same or higher level and their contents frequently ooze through the walls into the occupied apartments beside them. Was it any wonder that in such befouled environment that within two weeks the medical inspectors of the Committee on Public Health found twelve hundred unreported cases of Smallpox and
two thousand cases of Typhus Fever." The death rate for the City of New York at that period was 28 per 1,000 population, as compared with the 11 or 12 of today. The sanitary conditions of the hospitals of the period was little better than that of the poor dwellings and the mortality terrible. In the Hotel Dieu in Paris more than twenty-two per cent of all patients died. Overcrowding and congestion of the wards was common in nearly every hospital, a condition much aggravated by defective sewerage and a total lack of modern ideas of cleanliness. In Simpson's account of the hospitals in England and Scotland at that time, he stated that as a result of amputations in St. Bartholomew's Hospital the mortality was 36%, in the London Hospital 47%, Guys Hospital 38% and St. George's 38%. In nine London Hospitals an average of 41%. On the other hand, the mortality among amputations done in private practice was only 10%.

It is hard for us, of course, to visualize the conditions which brought about such frightful sacrifices of life in these days. The main features were, undoubtedly, lack of public water supplies (private or public wells nearly always polluted), lack of sewers (foul and always overflowing privy vaults or closets), difficulty in preparing hot water, public streets and thoroughfares reeking with garbage and unmentionable filth, for indeed everything was thrown into the streets and there allowed to fester and putrefy. It was the awakening from these conditions which witnessed the development of plumbing as we know it today. Public indignation was aroused and the authorities compelled to shoulder the responsibility for an abundant supply of pure drinking water, convenient for every household. It was the plumber and sanitary engineer who had to devise means whereby this scheme could be carried out, to design the necessary pipes, equipment and install necessary fixtures.

It was at last recognized that health could not be maintained in a dwelling surrounded by a sewage contaminated soil, and the only safe and efficient method of handling crude sewage, the water carriage system, was reluctantly adopted by city authorities. Here, again, it was the job of the plumber to devise means whereby this could best be accomplished, to plan and construct the house drainage system, to provide for the collection from each dwelling and ultimately to take care of the final disposal in river or ocean. From somewhat modest beginnings plumbing and sanitary engineering has become a full-fledged science, with a multitude of ramifications and a number of associated trades and specialties.

Plumbing requirements have changed vastly even within twenty years, so that what were considered luxuries then of the few and rich are now considered the minimum necessities of the masses. I need only mention the individual home supply of pure drinking water, of a hot and cold water supply for family needs, baths with bountiful water supply, and generally artistic fixtures in bathroom and kitchen. I remember, upon a visit to the Palace of Versailles, being shown by the guide the glories of the Grand and Petit Trianon or residences of Napoleon and his consorts. I noticed the absence of baths, and upon inquiry was shown the bath of the great Emperor Napoleon, pulled from a cupboard, a tin receptacle about four feet long and two feet wide, which would be scorned by any domestic or farm hand to take his weekly tub in.

We are housed in this age like princes, and sometimes forget that we look upon our sanitary conveniences as common-places which would have been the wonder and admiration of kings. Much of the work of the plumber has been pioneer efforts along the lines of improving the house surroundings, the condition of streets and alleys, insofar as these were dangerous from accumulation of refuse and storm water. More than in any other trade has the master plumber had his eye upon health, and it was this attitude that naturally moved him to associate with health departments. These latter, also recognizing the importance of the plumber in any scheme to improve the dwellings of the people, have nearly always appointed plumbing inspectors as among the first of such officials, and indeed in many instances in small towns the plumbing inspector was the sole official of the health boards, and his efficient work in this respect has become a tradition in Public Health history.

The master plumber was the first to realize the need for a standard method of doing plumbing work and for the various types of equipment and fixtures necessary. To intelligently gauge the requirements for proper craftsmanship, plumbing codes or ordinances were drawn up for every large city, and in some cases for states. The plumber himself voluntarily submitted himself to the necessity of taking a qualifying examination as master plumber so that the public could be assured of high class workmanship with the added safeguard to health. It has been asked why a plumbing code? The advantages of this are so obvious as to require little defense from me. It is sufficient to say briefly that plumbing regulations are necessary to prevent polluted water and leaking house sewers, for serious epidemics have been traced to defective plumbing. Experienced and trained men are necessary to properly install pipes and fixtures and to layout plans for dwelling houses and other systems. The legal requirements are really only the minimum recognized safeguards as set by experts.

It has been common experience that a house with defective plumbing is a bad investment and will keep its owner poor in health as well as wealth, I could relate to you many stories of plumbing work found to have been illegally installed of such a nature as to be dangerous not only to health but also to life and limb, of wastes from restaurant sinks drained into open toilet bowls, of vent pipes bured into blind ends in walls, of house sewers laid without regard to grade and without caulking or visible connection; in fact, a whole chamber of horrors could be filled from the experience of any plumbing inspector of a large city.

It has become quite an occupation among some of the "modernists", and by these I mean so-called health experts, who are impatient of tradition and of old-established and well-founded practices, to decry the value of the plumber in health preservation and to relegate him to a minor role in such obscure corner of a building department. Such an attitude of mind totally ignores the basic need for the care in installing sanitary appliances in the home and the very definite angle of health as a first consideration in the installation of any fixture for sanitary purposes. Much of this state of mind is due to ignorance of what plumbing really is and a blind avocation of the particular kind of specialty the speaker has been trained in. I was reminded of this attitude by a well-known professor of hygiene who, in reminiscing before an audience of the days he spent as assistant health officer, said: "My recollection is only of going up and down ladders to see plumbing installations which I did not understand and whose usefulness or danger I was totally ignorant of," and yet the professor is one of the most active in favor of divorcing plumbers from their old time allegiance to Boards of Health.

It is also quite a common argument nowadays to doubt the need for the laws and ordi-
nances adopted in former years for the maintenance of health and the prevention of disease, it being maintained that the conditions have so changed that many of the health laws are obsolete. Of course, the control of wells and cesspools in cities now is unnecessary, as they have practically ceased to exist. The laws, however, which require proper water supply pipes and their safe installation, for a safe and effective drainage system so that ground and houses shall not become polluted as of yore, are fundamentally needed at all times and cannot be dispensed with.

It is a favorite slogan among these ultra-modernists that "Sewer gas is not harmful," and therefore complicated and expensive venting systems are unnecessary. We will be willing to admit the harmlessness of sewer gas per se, but anyone who wishes to live in a house filled with this noxious compound must be mentally unsound, and there are few who will deny the lowered resistance, the loss of appetite, the headache and general malaise of any household unfortunate enough to be the victims of such a visitation from the nearest street sewer.

The plumber has earned his place as a sanitarian of the first importance, and indeed he occupies, so to speak, the first line of trenches in the attack of the health officer upon the forces that bring about disease and mortality in nearly every kind of community. According to modern scientific opinion, the requirements of first class plumbing are not excessive when it is considered how important the work is and how high the premium on knowledge and skill has increased in recent years. Such an item as proper ventilation of all fixtures and the use of proper size and style of pipes and traps is not often clear to a layperson, and even the professor of hygiene of whom I have just spoken, but to the knowledge of trained men they are vitally necessary in order to prevent disagreeable and undesirable conditions from existing, and what of the plumber himself? It would appear that his art and science have suffered tremendous changes in recent years. No more is he a worker in lead, and little of this formerly indispensable metal is found in modern plumbing except to caulk drain or sewer pipes.

The advent of the skyscraper buildings has introduced new problems into the plumbing business. One of these jobs alone represents in the aggregate the detail and work of many hundreds of smaller jobs. New forces have to be considered and forces and pressures formerly unknown in smaller buildings have to be reckoned with and provision made for a multitude of entirely new situations.

With the increasing demands for every kind of sanitary appliance in the home, office and shop, the sanitary engineer and master plumber require a great deal of skill in drafting plans and specifications for such plumbing, and it requires an equal amount of skill on the part of the plumber who installs it, although in some localities there seems to be a tendency for plumbers to specialize in one branch of the trade. This is not a healthy condition, for it produces so high a degree of specialist that it would shock the old-time plumber. The man who does the roughing-in does not install the fixtures, and visa versa.

It is necessary for apprentices to be compelled to go through every branch of the work, for only by such a rounded experience can he become a thorough mechanic. The journeyman should not be allowed to so narrow his activities as to make him useless for any but one kind of plumbing work. The problem before the plumber today is to determine whether the trade shall be broken up into a number of separate types of work or be retained under one master plumber with skilled assistants in all branches of the science; shall the plumbing business resolve itself into a few large wholesale manufacturers who will send out upon specification certain numbered parts which a common mechanic can assemble with the assistance of an instruction chart sent therewith.

There is no doubt that the modern movement is for simplification, but even this should demand the services of the trained and expert craftsman. The master and journeyman plumbers are now cooperating to compel the apprentice to attend trade and vocational schools. This is a step in the right direction, and indeed the school is much needed not only for the apprentices to the trade but the journeymen themselves.

The ability to screw up a pipe or to caulk a joint should not be the limit of craftsmanship required to pass the examination for master plumber. Modern conditions need at least a good schooling, a definite term of apprenticeship and a certain number of hours in class at night school or college, so that the essentials of plumbing and sanitary engineering can be taught. It is only by such an education as this that the plumber will be equipped to meet the present day demand for high technical skill combined with intelligence and sanitary knowledge. The plumber assuredly must become the domestic sanitary engineer, the increasing demand being for those who have expert knowledge of water, sewerage, heating, lighting, ventilation and of electrical appliances of every kind. How shall we obtain knowledge of these things except through study and technical instruction.

Finally, only the ignorant will dispute that the basic requirements of modern comfort in the home, for health as well as convenience, are those things which have been developed by the knowledge and skill of the plumbers as a profession, to facilitate the carrying out of a high degree of personal cleanliness (the modern bath and kitchen are triumphs of progress and convenience) and the efficient and inconspicuous handling of wastes both solid and liquid from the dwellings of the community.

To accurate and skilled plumbing must we depend as health officers for the installation of those safeguards to health which time and use have shown to be most important. As one of your authorities so aptly states: "Plumbing is therefore neither in fact or opinion a matter of simple living for the rich and delicate, but is rather an important subject of deep salutary interest on the one hand and of business acumen on the other, a matter of essentials deeply affecting the best interests of our own health and that of our neighbors, with which mere sentiment has no ground for association. Sanitary plumbing stands in closer relation to the health of the people than any other art or science."

I feel that the plumber and the engineer have made a success of the work, and although I feel the public does not realize just what this work is and the importance of it, yet it has been successful. I had occasion to attend a demonstration in Newark and listen to the remarks of Mrs. Gorson, a Channel swimmer, and when the little demonstration was over they asked her various questions, some of them very personal questions, and there was one that appealed to me particularly. She was asked, "What are you going to do with all the money you will make?" and she said, "I am going to use it to give those things to my children that I did not have myself and could not afford.

It seems to me the sanitary engineer and the plumber are doing that very thing. They are making things happier, making things pleasanter, and making conditions generally more livable for the people who are coming after them, and it is really work of a very high
class nature.

In the course of my health office work, of course, you realize, I have a lot of routine work in the office and therefore I want you to excuse me if I read this paper which I have prepared. I have not had time to memorize it, and I hope you will bear with me and excuse me for not giving you an extemporaneous address.