

Louisville, Kentucky, July 18, 1932.

Doctor A. T. McCormick, being sworn, states that he is a resident of Louisville, Kentucky; that he was Assistant Secretary of the State Board of Health of Kentucky from 1897 to 1912; that he has been Secretary of the State Board of Health and State Health Officer of Kentucky since 1912; and that he practiced medicine in Bowling Green and Warren County from 1897 to 1920 inclusive; and that he was a property owner in the district in which it is proposed to start the construction of a sanitary sewerage system for the City of Bowling Green.

Affiant states that about 1890 or 1891, following the installation of the sanitary sewerage system in the City of Memphis, Tennessee, a sanitary survey of Bowling Green was made at the request of a Common Council of the City by the engineer who had constructed the Memphis system. At that time he was a clerk in the office of the State Board of Health and was familiar with this survey; that said survey called the attention of the people of Bowling Green to the danger to the health of its citizens from the use of underlying caves and cavernous streams through its underlying limestone sub-strata.

The building of a sanitary sewerage system at that time was not undertaken and during subsequent years Bowling Green had a very high sick and death rate from typhoid fever and other intestinal diseases. As a property owner, I was familiar with the method of the disposal of sewage into the underground streams through the caves and it was generally ineffective, expensive and troublesome. Sewage discharged in the higher levels of the city flowed to the surface and into the cellars or lower levels and was and is a source of disease and cause of filth.

At our residence at the corner of Twelfth and State Streets, at different times, we opened five different caves at considerable expense. When the last of these had filled up we installed a septic tank under the back porch, which discharged its effluent under the grass in the front yard. The initial cost of its installation was over five hundred dollars and there was an annual cost for repairs.

When we built our building at the corner of Tenth and State Streets we found two under-ground streams emptying into the excavation made for the cellar and it cost something more than twelve thousand dollars to build the concrete retaining walls and the necessary septic tanks for the relief of this condition. Both of these streams contained obvious sewage contamination.

During the time when I was engaged as a practicing physician in Bowling Green the incidence of typhoid fever and other intestinal diseases was very high. Since 1910 we have had accurate vital statistics for Kentucky and Bowling Green has had a higher death rate from typhoid fever than any other incorporated city of the first, second or third class. In my opinion, this has been largely due to the crude methods of sewage disposal.

In 1911, at the request of the Common Council and Mayor, a sanitary survey of Bowling Green was made by Paul Hansen, State Sanitary Engineer. Mr. Hansen had previously been State Sanitary Engineer of Ohio and was subsequently State Sanitary Engineer of Illinois and is now one of the most distinguished sanitary engineers in private practice in this country. From his report I quote:

"Bowling Green occupies a natural amphitheatre formed by a crescent shaped ridge in the southeastern portion of the city. The slope of the site upon which the city is built is in a general way toward Great Barron River to the northward, but the greater portion of the drainage from the city, and this includes the main business district, is intercepted by a small stream passing through the center of the city and commonly known as "Whiskey Run Sewer". This designation is derived from the fact that the stream is generally used to receive various sorts of liquid wastes.

In former years much sewage entered the ditch causing it to be exceedingly foul and offensive, but at the present time sewage has been almost entirely eliminated and such as does enter is subjected to a more or less prolonged period of retention in cess pools or tanks. The result of this treatment is to render the sewage free from the coarser suspended matters and for this reason its presence in the waters of the stream is

scarcely perceptible to the eye. The most objectionable contamination so far as appearance and odor is concerned consists of large volumes of soapy liquids from a laundry and wastes from a gas house. Aside from this the stream is exceptionally free from the gross contamination that is ordinarily found in streams which pass through unserved towns the size of Bowling Green.

The explanation of this lies in the peculiar character of the local geological formation, which permits of the disposal of sewage and drainage through subterranean passages. The underlying rock, which in most parts of the city reaches to within a very few feet of the surface, is a very pure limestone which is readily soluble in water containing carbonic acid. The result has been the formation of innumerable channels within the rock varying from very small size to passage ways that may properly be called caverns. These channels are entered from the surface by natural sink holes or through holes drilled or excavated for the purpose. Practically all of the buildings in Bowling Green which have indoor plumbing have connection with one of these sink holes for disposing of sewage. If by this means the sewage could be effectively removed so that it would not appear elsewhere to contaminate wells or emerge at the surface and create offensive odors, the final disposal of the sewage might be considered satisfactory.

The first thought that naturally occurs is that such disposal of sewage must inevitably endanger wells and this is certainly true but the people of Bowling Green have long since learned of the danger to wells in open limestone formations so that at the present time there are no wells whatever in use within the city. There are other dangers also resulting from the promiscuous discharge of sewage into sink holes, the most important of which is the general flooding of cellars by sewage contaminated waters. As an example there may be mentioned the excavation made for the McCormack Building at the corner of State and 10th Streets in which a large stream of water was found which showed unmistakable evidences of the presence of sewage. Other instances have been related of sink holes being rendered ineffective by the water proofing of neighboring cellars.

Perhaps the greatest practical objection to the use of sink holes is the element of uncertainty in their operation. A few sink holes have been known to operate successfully for years and then suddenly become clogged. Removal of clogging is usually expensive and frequently is entirely impossible. It therefore happens that large sums of money have been expended to secure sewage disposal sometimes without avail. As might be expected there are a number of house lots on which sink holes cannot be found so that houses built upon them must remain without the convenience of modern plumbing.

Most property owners in Bowling Green who have experienced difficulties with sinks are quick to appreciate the great advantages that would result from a system of sewers which would remove quickly and effectively all liquid household wastes and cellar drainage. Even many of those who have been so fortunate as to discover upon their property good sink holes are, because of a commendable sympathy with their neighbors or because of an ever present fear that their own sink holes may become clogged, also favorably disposed toward the introduction of a good system of sewers. In short it may be positively stated that the greatest municipal need of Bowling Green today is a system of sewers.

The matter of sewerage has several times been before the public of Bowling Green. In 1892 the services of J. H. Humphreys were secured through the efforts of Dr. J. H. McCormack and Colonel Smith, then Mayor, which resulted in the planning of a fairly comprehensive system of sewers for the entire city. The plans were in every way satisfactory but the estimated cost was so great that the matter of installing sewerage was dropped.

The matter of a sewerage system again came to the front in 1907 and Mr. Granberry Jackson, consulting engineer of Nashville, Tennessee, was engaged to formulate plans and submit a preliminary estimate of cost. The plans of Mr. Jackson followed very close those of Mr. Humphreys, but were extended to show more in detail the location and point of discharge of the main outfall sewer. Again the estimated cost was so great that nothing was done at that time.

The great need of a sewerage system was so apparent, however, that public officials and prominent citizens have not lost sight of the ultimate necessity of installing same, and special attention has been directed toward ways and means for lessening the cost or at least minimizing the burden upon the people in the form of increased taxation."

In 1914, at the request of the Common Council to the State Board of Health, a sanitary survey of Bowling Green was made by Doctor W. H. Frost, then a Past Assistant Surgeon of the United States Public Health Service, who afterward was an Assistant Surgeon General of the United States Public Health Service, and who is now head of the Department of Public Health Administration of the Johns Hopkins University. From Doctor Frost's comprehensive survey, which included the public water supply system, I quote:

"Although so much space has been devoted to a discussion of the public water supply, this constitutes by no means the most important or menacing of the sanitary conditions observed in the city. It may be said without hesitation that the most imminent danger to the health of the city lies in the entire absence of any system of sewage disposal with the resultant gross accumulation of human filth in the city."

"A sink", as the term is used in Bowling Green, signifies an opening into an underground sewer or water-course, such as may be found by careful search in almost every yard in the city. It is customary, when a sink has been located, to test its capacity by turning in a considerable stream of water and, if this is completely and promptly carried away, the sink is considered suitable for receiving house sewage. Sometimes these sinks open directly into water courses of considerable size and such sinks may be used for years without clogging. More commonly the sinks are merely sewers, drained probably through small openings in the limestone, which sooner or later become clogged with the solid matter of sewage, so that the sink overflows. Blasting with a charge of dynamite frequently opens up a clogged sink, making it available for further use; but if this fails the practice is to abandon the clogged sink and try another one. Where sewage is discharged through septic tanks such clogging is less likely to occur.

The first and most obvious objection to this convenient method of sewage disposal is that it is an entirely "blind" method. There is ordinarily no knowledge of where the sink discharges, but there is good reason to at least suspect that all too frequently they discharge into nearby or even distant cellars or surface depressions, so that, while a sink may form a convenient means of removing sewage from a man's premises, it often amounts to discharging it in his neighbor's yard. Another objection to this method of sewage disposal is that in spite of its apparent simplicity and convenience it is, on the whole, a costly method. That with the expense of locating a sink, often succeeding only after numerous attempts, opening up clogged sinks, the construction of septic tanks, and cementing cellars to make them proof against others' sewage, it is probable that the total cost to the householders using them is frequently more than would be their share in payment for the construction of city sewers.

Even the discharge of sewage into sinks however, is less objectionable than the other and more common practice of emptying discharges directly into open surface privies. Sinks, as compared to privies, have at least the advantage that they are underground, protecting the discharges from exposure to flies, preventing the unsightly nuisance of exposed discharges, and affording at least the hope that they may carry the sewage to distant places, where it will do no harm. All things considered, the most important and serious of all the unsanitary conditions noted in the city is the common use of surface privies, and consequently, considerable time was spent in arriving at an estimate of their number, character, care and distribution. Information was collected by a personal inspection of the alleys in various sections of the city, and by a house-to-house canvass of 40 residences located in five representative, well-sattered, city blocks, selected mostly in the better residence sections.

In the canvass of these 40 residences, 26 were found to be provided with water-closets, the other 12 having no provision for sewage disposal except open privies; and of the 26 premises having water-closets, 18 were found to have, also, open privies in the rear for the use of servants. In one of the choicest residence blocks in the city, where all premises have water-closet connections, 10 premises were inspected and 8 were found to have open privies in the yards for the use of servants. So far as may be judged from the results of this limited canvass, two-thirds of the premises connected with water-closets also have open privies. While this percentage may not hold generally true, it may be conservatively estimated that at least one-half of the premises having water-closets use privies also. So far as could be ascertained by observation and inquiry, every house not connected with a water-closet has a privy.

As to their construction and care, or rather lack of care, these privies are as bad as possible. In an inspection of many blocks, noting altogether over one hundred privies, only two were observed in which the discharges were kept off the grounds in one by the use of a pail, and in the other by the use of a box. Both these privies were, however, entirely open, the discharges being freely exposed to flies. The other privies seen were, without exception, surface privies, their contents being discharged upon the ground, exposed not only to flies, but in most cases also to small animals, the backs of the privies being usually open. Occasionally, a privy was seen giving evidence of having been recently cleaned and of some attempt to at least minimize the nuisance by the use of dry earth and lime to cover the discharges. Even this, however, is rare; the majority of the privies seen being in a filthy condition with large accumulations of discharges. There is absolutely no municipal regulation of the construction, care, or cleaning of privies or of the disposal of their contents. Inquiries at the houses visited elicited the information that privies were cleaned occasionally by the owners or by scavengers employed for the purpose, their contents being carted away to parts unknown, or, very commonly, being buried upon the premises.

As to the distribution of privies, they are, of course, somewhat more numerous in the poorer and more congested residence sections; but, as already stated, they are very common even in the business section. In the rear of the public square, which is the business center of the city, the site of the most flourishing and attractive shops, are numerous filthy open privies used by a large number of business employees, and utterly neglected. On the whole, it seems safe to say that there is probably not a block in the city without at least one privy, more commonly a dozen.

It is virtually impossible to exaggerate the filthiness of this condition, or its sanitary menace. Such a condition may be expected in a poverty stricken industrial settlement of ignorant laborers, or in a small village where municipal authority is loosely organized, or non-existent, but in a city of the size of Bowling Green, a city in which

the municipal authority has been organized for a hundred years, and which bears such evidences of prosperity, the tolerance of such conditions is almost as incomprehensible as it is inexcusable. It can be understood only on the assumption that the residents, accustomed by long usage to the conditions surrounding them, have failed to realize their full significance and gravity. It needs, however, but a brief consideration to show how intimately the conditions must affect the health and even the decency of every citizen.

Every block in Bowling Green has one or more open privies, usually five to a dozen, each being used by an average of perhaps four or five persons, so that, in virtually every block are to be found the exposed discharges of twenty to fifty people, accumulated often for months. Every kitchen and dining-room, every restaurant and soda-fountain, fruit-stand, bakery and grocery in the city is within easy fly-range of from one to a dozen such accumulations of filth. It needs only the most casual knowledge of the habits of houseflies and a moment's consideration of their swarming prevalence to see how universal must be the contamination of food with human discharges through this agency alone. But this is not the only route of contamination. Privy contents are scattered by chickens, or washed by rains into yards, alleys, and streets, whence they are carried upon the feet of people or domestic pets into residences. Considering the habits of young children, whose dirty-motions do not deter them from rubbing their hands, playthings, or food upon the floor one moment, and putting them into their mouths the next, it is but a short route from the floor to the baby's mouth. Again, the practice of burying privy-contents in gardens constitutes still another source of danger, through the possibility of contaminating vegetables which are grown in contact with the soil and are eaten raw, such as celery, radishes, turnips, etc.

The citizen who, realizing the repulsiveness and danger of these conditions, earnestly desires to protect himself and his family, may remove his own privy but that leaves him unprotected against the privies of his neighbors, which may be even closer to his own house. He may thoroughly screen his house and wage constant warfare against flies, and still be exposed to the nuisance and danger of his yard or cellar being polluted with the contents of his neighbor's privy or sink. The remedy of the condition lies not in individual but in concerted and common action."

The records of the State Board of Health show that the average death rate from typhoid fever in Bowling Green from 1911 to 1931, inclusive, is more than twice as high as for any other city of more than ten thousand inhabitants in the State of Kentucky. A study of these cases and deaths show that most of the cases occurred during the hot months. Doctor Frost well stated:

"The close study of typhoid fever in many communities has established the general rule that when the excessive prevalence of typhoid fever is due chiefly to the use of polluted surface water, the disease is more prevalent in the cool months of late autumn, winter and spring; and where the chief factor in causing the disease is the spread of infection from case to case, through flies and other agencies, spreading infection from open privies, etc., the season of greatest prevalence is in the summer and earlier fall months.

In order to determine accurately the relative importance of various factors in causing a high prevalence of typhoid fever in a community, it is necessary to have such detailed information as can be obtained only by a close study of each case. However, even in the absence of such extensive data, it is safe to conclude that in Bowling Green the condition chiefly responsible for such an excessive prevalence of typhoid fever is the faulty method of sewage disposal, the emptying of human discharges into sinks and open privies, affording such abundant opportunities for contamination of food in the ways already discussed. This conclusion, justified by a general survey of the status of sewage disposal in Bowling Green, and a general knowledge of the quality of the city's water-supply, is confirmed by the seasonal prevalence of typhoid fever, consistently greatest in the summer and autumn.

This does not mean that the universal use of sinks and privies is the only condition responsible for typhoid fever in Bowling Green. Beyond a doubt, the lack of proper precautions in the disinfection of the discharges of typhoid patients and personal contact with typhoid fever patients and carriers are important contributory causes. In all probability, infection of milk supplies has, from time to time caused outbreaks, which, without prompt reporting and investigation of cases, would not be recognized. The failure to enforce the removal of manure and garbage, by affording to flies their favorite breeding-places and so increasing the numbers, together with carelessness in regard to screening of homes and public places is a factor of importance, increasing the opportunity for fly-contamination, and finally, the public water-supply while not the chief cause of typhoid fever in the city, can not, under existing conditions, be considered safe; it has doubtless been a contributing factor of some importance, and unless carefully safeguarded may at any time cause an epidemic."

Dr. Frost states that "The first and most urgent recommendation is that the city construct a sanitary sewerage system. It is not within the province of this report to give advice as to the financing and construction of a system of sewers, other than that the system should be broadly/systematically planned to cover all sections of the city, and of sufficient capacity to serve all probable

future needs. As to its cost, no estimate will be attempted; but, whatever the cost of construction, it will be less than the price which the city has paid and will continue to pay for attempting to do without a sewerage system. The planning and constructing of this system should be begun immediately, there being no other one matter of such vital importance to the city."

Due to the location of Western Kentucky Normal School and the Southern Business University in Bowling Green, health conditions are of importance to every family in Kentucky and to many in other states. Almost every year there have been one or more deaths amongst young students coming from other counties in the State to Bowling Green for an education. The State Board of Health considers the sanitary sewage disposal problem of Bowling Green as one of the most important public health problems of the State of Kentucky. Through its Bureau of Sanitary Engineering it has studied, and upon its recommendation, has approved the plan of the J. H. Chester Engineers, Pittsburgh, for the installation of a sanitary sewerage system and by a formal action of the Board it has determined that this is a safe, effective and economical plan of sewage disposal.

Charles T. Brown

Personally appeared before me this eighteenth day of July, 1933,
A. T. McCormack, of Louisville, who swears that these statements are
true to the best of his knowledge and belief.

Maecina Sullivan