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W. P. WHITE, M. D.,

Health Officer.

LOUISVILLE, KENTUCKY.

1897.

CITY SANITATION, WATER, GARBAGE AND SEWERS.

BY W. P. WHITE, M. D.,

Health Officer of the City of Louisville.

Reprinted from the American Practitioner, August 25, 1894.

The effects of city life upon the health and vitality of those subjected to it form an increasingly important subject for investigation and study by the physician, sanitarian and philanthropist. Within recent years there has been a marked advance in the apprehension and the improved method of dealing with the complicated and difficult questions involved in the relations of public health to municipal government in our rapidly growing cities

The history of the profession presents in every branch a record of ever-spreading additions to our knowledge acquired by careful observation and experiment. Among the divisions of our complex science, not a few of which are becoming differentiated and distinct, none has pursued a path of more uninterrupted progress than sanitation.

Sanitary science is no longer founded on ignorance and empiricism, and made to fit in with notions engendered by prejudice or imperfect information; but it is pursued on lines of careful and systematic investigation, influenced by, but not entirely subjugated to, the prevailing speculations and discoveries in pathology.

Primitive, crude and inefficient sanitary methods are gradually yielding to the obvious necessity for better and more effectual protection of the public health and comfort;

still, it must be conceded that the sanitary condition of our cities is far from what it could and should be.

The most important features of city sanitation are embraced in the disposition of garbage, sewer connections, drainage, and, especially, pure water.

The necessity of pure and wholesome water may at once be appreciated when we recall the following facts; about seven-eighths of the human body is water; at least three-quarters of the earth's surface is covered with it; the air is full of it in the form of vapor; and all animal and vegetable substances, and many mineral substances, are largely made up of it. But though water is so plentiful, it is never wholly pure; even that which falls as rain is soiled with matter washed out of the air, such as dust and smoke.

J. W. Hill, in an article on Typhoid Fever in American Cities, published in the Engineering Record, gives as the result of a compilation of the statistics of that fever from the seventeen principal cities of the United States the following average mortality per 1,000 population for the four years, 1890 to 1893, inclusive: Boston, 0.34; Providence, 0 37; New York, 0.21; Brooklyn, 0.20; Philadelphia, 0.52; Baltimore, 0.45; Washington City, 0.76; Pittsburg, 1.04; Buffalo, 0.40; Cleveland, 0.55; Detroit, 0.35; Chicago, 1.00; Milwaukee, 0.33; St. Louis, 0.51; San Francisco, 0.41; Cincinnati, 0.53; Louisville, 0.81.

He also cites the statement from Dr. Louis C. Parkes' Treatise on Hygiene, that in the city of London for the decade 1871–80, the death-rate from typhoid fever was 0.24 per 1,000 of population, and for the decade of 1881–90, it was 0.18 per 1,000 of population, adding "that six of the eight London water companies take their water from the river Thames, a stream nearly as vile as the Chicago river, yet by careful filtration of the Thames water the quality is so much improved that the typhoid death-rate of London is but one-fifth that of Chicago. And thus, cities like New York, Brooklyn and Boston, which depend upon impounded

water, gathered on watersheds at considerable elevation above the respective cities, suffer less from typhoid fever than cities like Philadelphia, Pittsburg, Cincinnati, Louisville and St. Louis, which draw their water supplies from sewage-polluted rivers."

There is a pretty general concensus that river and lake waters are purer than spring and well waters, because they consist of rain water, which is the purest, and the water of streams which run only over the earth's surface, while spring and well waters come up through the earth, where they become mixed with solid matter. When water flows through a town, or near sewers connecting miles of houses together, it takes up impurities from the drainage, and the spores or seeds of disease find their way from house to house. It thus sometimes becomes even poisonous, and often causes typhoid fever.

The different cities adopt various modes for disposing of the garbage. Seaport towns put their refuse matter into scows, towing it out to sea and burying it beneath the waves. But it has been discovered that, under cover of darkness, the limitation within which these scows are allowed to discharge their death-laden cargoes is disregarded and this vile matter is frequently washed back to the adjacent shores. Some cities have tried the experiment of collecting the garbage and offal for purposes of sale. This presents dangerous and insuperable difficulties. Its necessary detention at some point where gathered together, even for a few hours before it is taken away, results in poisonous exhalations; then its transportation through the streets is offensive; and the last, but by no means the least, objection to this system is the fact that this vile stuff, as a rule, when sold, is used to feed animals, which are in turn killed and brought into the city markets. In this connection it may be said that the report of the Massachusetts State Board of Health for 1888 shows that in swine fed upon the city refuse of Boston over twelve per cent were found to be infected with

trichinosis, and in those fed upon the garbage at the public institutions of the State, seventeen per cent.

Other cities have used the garbage for filling ponds and lowlands; for these purposes coal ashes are unobjectionable, but they should be kept free from putrescible matter, for which and any other form of disease-germinating waste, fire is the only safe end to which it can be committed, for it is nature's greatest disinfectant. All cities will eventually come to the cremation of garbage as the simplest, safest and cheapest solution of the question.

Cleanliness is a paramount necessity for freedom from diseases of contagious character; plagues and pestilences of various kinds show a strong affinity for the filthy. I am an earnest advocate of thorough and general sewer systems, constructed upon the most approved plans. And, so far as practicable, these sewers should be placed in the alleys. The street drainage should be to the alleys, and certainly a transfer of the catch-basins from the front of our houses to the rear would be a welcome change. In reference to this our city has a most excellent ordinance that I would commend to the attention of health boards. It requires, first, "That all owners of houses in the city, situated upon lots abutting upon a street or alley in which there is a public sewer, shall connect all drain pipes of such houses with said sewer." Second, "It shall be unlawful for the owner of such house to keep or maintain a dry-well on such lot or to drain any privy matter into same." Its purpose is to break up the practice of using drain-pipes to empty filthy water and other refuse into the gutters, streets or alleys, where, with dampness and solar heat in the summer months, they produce the most deleterious effects.

The first object of medicine, it has been well said, is to prevent disease, and the next to cure or relieve it; and the nearer we approach to these ends the more successful may we claim to be. Hopes for the future clearly lie in the direction toward a better comprehension of the nature of

life, and inferentially, of disease; toward improvement in the methods of research into the causation of disease, and the avoidable or preventible causes of disease. Vital statistics furnish us with ample data for estimating the increasing value of preventive and remedial processes or agencies in improving health and lengthening life.

Etiology must be sought chiefly in our surroundings—the air we breathe, the water we drink, the food we eat. How immeasurable is the distance which separates the mental attitude of the inquirer of to-day, engaged in tracing the causation of an epidemic disease, from the mystics who bewildered themselves with the notions of malignant spirits, of evil humors, or even of "epidemic waves!"

Until the evolution of bacteriology into a distinct department of science, we had no clear ideas as to how pure air and pure water operated in bringing us health, and along this line sanitary science has made great development. Sanitary science seeks to check the growth of disease-germs, and to destroy those already developed. To fight an invisible foe is difficult work, but we are steadily improving our ways of doing it. Measures, which the experience of a comparatively recent period has taught us to practice, have produced results so satisfactory as to encourage us in their further extension. For example, there is now no need of much interruption to commerce on account of cholera, because we know the cholera organism, can tell whether it is present, and know how to destroy it. Parasitic pathology has made great strides, and there is no question that the study of bacteria and bacilli has greatly widened our views of the nature of the disease and led to the most practical results of the first importance as regards its prevention and modification. Especially has this been true when employed in certain infectious diseases, such as cholera, scarlet fever, typhoid fever and diphtheria. In many instances this better knowledge of the nature of the disease and of its remedy has enabled us to extinguish it at its primary focus.

Sanitary science clearly points out certain duties for us to perform for self-protection that are yet imperfectly carried out, and, in many instances, sadly neglected. There is need for more definite and precise knowledge as to the causes of disease and the relations which they have to circumstances which may and should be controlled by the community as a body, and not be left to individual action. There are things affecting the health of citizens over which the city has chief or exclusive control, and for the existence and condition of which it should therefore be held to a corresponding amount of responsibility. But it must be remembered that the requirements of a city as regards public health and comfort must be considered in connection with its other needs. Its means are limited, and it can only apportion these to the manifold requirements as wisely as possible.

P. S. This article was included in the Municipal Report of 1894.

VACCINATION.

BY W. P. WHITE, M. D.

Health Officer City of Louisville.

Reprinted from the Louisville Medical Monthly, January, 1895.

It is difficult for those who live in that security from the horrible and universal plague of small-pox, for which we are indebted to Jenner's immortal discovery, to realize the greatness of the blessing he conferred upon mankind.

Dr. Jenner's attention was first excited by the circumstance of finding that some individuals, to whom he attempted to communicate the small-pox by inoculation, were not susceptible of the disease; and, on inquiry, found that all such patients, though they had never had the small-pox, had undergone the casual cow-pox, a disease common among the farmers and dairy servants of Gloucestershire, who had some idea of its preventive effect.

Instead of treating this common belief among the simple agricultural classes as a vulgar error, founded upon superstition or credulity, Dr. Jenner pursued the subject with great patience and sagacity for many years, making a thorough study of the various forms of varioloid eruptions and their distinguishing characteristics. He became satisfied that the *variolæ vaccinæ*, as the complaint has since been termed, having, in the first instance, been produced by the accidental or designed inoculation of the matter afforded by a peculiar disease affecting the udder of a cow, could be propogated

from one human subject to another by inoculation, rendering all who passed through it secure from the small-pox. His investigations commenced about the year 1776, but not until 1796 did his discovery receive the public recognition of the profession by its introduction into St. Thomas' Hospital in London, and its adoption in the English army and navy.

Many of the world's greatest discoveries are attributed to accident, but such accidents happen only to the most trained and observant minds. Dr. Jenner was an ingenious practitioner, a man of varied accomplishments, and possessing, especially, the talents of patient observation and reflection. It is to the man of talent and science that the world is indebted for the procedure by which that dire disease, small-pox, can be prevented or greatly modified. Cuvier justly claims, "if vaccination were the only discovery of the epoch, it would serve to make it illustrious forever."

It is useless here to discuss the various objections which have been raised, and the suspicions which have been thrown out, against the permanent efficacy of this perventive, since the wide, extended and unbiased experience of the most skillful observers seems amply to have proved, that when the vesicle has gone through its regular stages, the person is afterwards insusceptible of natural and of inoculated small-pox; the exceptions being so few as either to be referable to imperfect vaccination or to idiosyncrasy.

In order to receive its full protective influence, vaccination should be accompanied by a strict regard to all the essentials developed by observation and science for its perfect consummation. Imperfect or ineffectual vaccination leads the unfortunate victim, under the cloak of an imaginary security, into danger which he would otherwise avoid.

In all doubtful cases vaccination should always be repeated; and as no inconvenience results from a repetition of its inoculation, and the disease is not infectious by effluvia, it may be performed at certain intervals, or may even be

tested as to its efficacy by variolous inoculation. If the first vaccination has been perfect, the second will result only in spurious or irregular pox.

The incubative stage of small-pox is twelve days, that of cow-pox is nine days.

My experience favors humanized virus of about one or two removes, as the most reliable vaccine virus that could be used. About the third day after inoculation the puncture generally becomes red and elevated, but the periods of its incipient progress are very uncertain; it then continues to enlarge and become vesicular, and is in full perfection about the eighth or ninth day, at which period also the surrounding circle of inflammation, or *areola*, is at its height. About the eleventh or twelfth day this declines, and the center of the vesicle becomes brown, and gradually dries up into a dark brown circular scab, depressed in the center. During the progress and scabbing off of the vesicle great care should be taken to avoid all external injury; and if much inflammation comes on spontaneously two or three days after inoculation, and especially if suppuration ensues, the probability is that the operation has failed, and in all such cases the inoculation should be repeated. Although if one of the vesicles has gone through the above described progress, the failure or irregularity of the other is of less consequence. Therefore the development and appearance of the vesicles, their proper size, the successive stages, duration of the affection, the areola, and constitutional symptoms are the criteria to be watched. A distinct circular, radiated, punctuated, and not very large cicatrix may be regarded as a very conclusive indication that the inoculation is perfect. On the other hand, when the scar is large and bears the marks of having been formed by high local inflammation, and does not present the distinctive characteristics above mentioned, there is much reason to apprehend that the vaccination is incomplete.

Dr. Cyrus Edson, Chief Inspector of Contagious Dis-

eases, New York Health Department, in his annual report of 1890, says: "Small-pox is fatal in a very large proportion of those whom it attacks; it kills from thirty to forty per cent. of its victims." And he adds, "during the seventeenth and eighteenth centuries not a decade passed without an occurrence of fearful epidemics of small-pox. In England from seven to nine per cent of all the deaths were due to it." We may add that during the sixteenth century it claimed 3,500,000 victims in Mexico; in 1734 nearly two-thirds of the population of Greenland were swept away by an epidemic of this disease, and in Iceland, during the same year 18,000 persons died from it, out of a population of 50,000.

Vaccination should be made a precedent to admission to all schools, and especially public schools. In the public schools of Louisville no pupil is admitted without producing a certificate of vaccination from a reputable physician.

The following order is issued by the Health Office to Superintendents, Principals and Teachers of the schools in the city:

Your attention is called to Section 42, Page 673, of the City Code, viz: "No principal of any school, and no principal or teacher of any private, sectarian or other school, shall admit to any such school, such child or minor, who shall not have been vaccinated, etc." Also, Section 14, Page 365, viz: "That every person being the guardian or having the care, custody or control of any minor or other individual, except such as have had small-pox or varioloid, shall cause and procure such minor or individual to be so promptly, frequently and effectively vaccinated that such minor or individual shall not take, or be liable to take, the small-pox. Any person violating this section shall be liable to a fine in the City Court of not less than ten nor more than twenty dollars, and shall also be liable to a like fine for every ten days thereafter they shall delay having the operation of vaccination performed."

You are requested to call at the Health Office to procure tickets for distribution to the children attending your respective schools, as it is my duty to enforce the above provisions of the law.

[FACE OF CARD]

PRINCIPALS MAY SIGN TICKET IF CHILD HAS BEEN REGISTERED VACCINATED.

This Certifies that .....

HAS BEEN VACCINATED.

.....*M. D.*

Date.....

Or.....*Principal,* .....*School.*

[BACK OF CARD.]

By recent legislation the presentation of this Certificate filled by some reputable Physician is made a condition precedent to admission to any school in Louisville. Parents or Guardians can have their children vaccinated by City Physician free, by signing this card.

Teachers are required to report all unvaccinated children, through the Principal or Superintendent, to the Health Department.

The first year these tickets were issued for distribution over eight thousand chlldren applied for vaccination. Last year only about four thousand applied, showing a reduction of fifty per cent in the number requiring vaccination.

While not favoring compulsory laws generally, I hold that no one should be permitted to endanger the health and life of a community by his ignorance or neglect. The rights of private foolishness, in rejecting what is known and in believing what is preposterous, should not be allowed to assert themselves to such a baneful consequence.

The general problem, of which Jenner's discovery was a particular case, has been grasped in a manner and with results which are simply unimaginable. The results are calculated, not only to arouse public interest, but to excite public hope and wonder.

Dr. Jenner's suggestions first met with much hostility.

A great scientific theory has never been accepted without opposition. The theory of gravitation, the theory of undulation, the theory of evolution, the dynamical theory of heat, all had to push their way through conflict to victory. And so it has been with the germ theory of communicable diseases. Some persons dispute it still—even denying the communicability of cholera. Such must always be the course of things as long as men are endowed with different degrees of insight. Where the mind of genius discovers the distant truth, which it pursues, the mind not so gifted often discovers nothing but extravagance which it avoids.

However, the most progressive field of our profession is the practice of arresting the diffusion of disease by limiting the spread of contagion; the establishment and firm enforcement of sanitary regulations having primarily for their purpose the safeguarding and protection of the people, as far as practicable, from the causes which produce and spread disease. In the grand system of preventive treatment we have rational grounds for the belief if the spread of infection were restricted by law, that contagious diseases would practically be extinguished, resulting in a gradual but constant diminishing of the flood of mortal ills now prevailing.

CITY WATER SUPPLY AND FILTRATION.

BY W. P. WHITE, M. D.,

Health Officer of the City of Louisville.

Reprinted From the American Practitioner, April, 1896.)

The supply of an abundant quantity of pure water, best fitted for drinking and other dietetic uses, to cities and towns has become one of the most important topics which can engage public attention. The habits incident to an advancing civilization involve continually the consumption of a larger amount of water per head of the population. The procurement, besides a sufficient supply and distribution, of proper wholesomeness in the water is a very serious problem with many of our larger cities. The connection of purity of the water used for domestic purposes with the condition of the public health, has been proved most conclusively; and it is found that the ravages of epidemic diseases in any district are widespread and fatal very nearly in the proportion of the impurity of the water, especially in organic contamination, supplied for the use of the inhabitants.

The condition and quality of the water supply and its influence on the public health being irrefutable, sanitary rules, based on the most careful study, should aim to secure a quality of water which will satisfy the requirements of the most advanced hygienic regulations for potable water.

All natural water is more or less contaminated by foreign matters. The impurities present in natural waters are mechanical, gaseous, dissolved mineral and organic impurities; organic suspended impurities consisting of animal and vegetable organisms, either living or dead, of animal remains and refuse, and of vegetable matter. Of soluble

organic impurities, the vegetable matters are not usually of a very deleterious character, but it is the animal matters which are most dangerous, and are frequently the means of spreading contagious diseases. A polluted water supply is one of the greatest of disease breeders, containing a large number of bacteria, many of which are disease-producing germs. It is the universal opinion of all investigators, that typhoid fever is a water-carried disease. While typhoid fever is the most important one in its disastrous results, there can be no doubt that other diseases owe their existence directly to the use of polluted water, and that the use of such water is detrimental to the general health.

Rain water, collected at a distance from inhabited places and upon insoluble surfaces of rock or sand, is the purest kind of natural water. Yet even common rain water is usually yellowish on account of the fine dust, smoke, and other impurities which it gathers in falling through the air. But after it has been strained through the earth it is sweet, clear and bright, because the beds of sand and gravel through which it trickles are natural filters which take out all colors and impurities.

The common and most eligible sources of public water supply are rivers and lakes. These are by far the most available, and usually supply all requirements excepting that of hygiene; and only with methods devised for eliminating from these waters all organic matter and bacteria inimical to health can they be wholly satisfactory.

Chemical and biological examinations demonstrate that river water is at all times, and occasionally, grossly polluted. Every one recognizes the dangers lurking in water from a large river carrying the sewage and drainage from many thousand square miles of settled and built-up territory, and made the channel for the waste and filth of every city and town on its banks, as well as on the banks of its tributaries. Since the adoption and extended use of water-closets, the waste-water of towns has become more offensive than it used

to be in the old days of privies and cesspools, and therefore the consequent increasing pollution of the rivers. And it can not be claimed that the germs, productive of typhoid fever and other diseases communicable by ingestion, are entirely removed or destroyed by the self-purification of these streams.

The Ohio River water unpurified can scarcely be classed among safely potable waters. Before it reaches Louisville the Ohio River receives the sewage and surface drainage from many cities and towns, aggregating a population of probably two millions of people; carrying, with the sewage of these two millions of people and the urban drainage from the cities and towns on its banks, the germs of all infectious diseases directly or indirectly coming into it from this vast territory and population. The result of this contamination is forcibly illustrated by the vital statistics compiled from official reports of health departments. For the three principal cities taking their water supply from the Ohio River or its tributaries, the death-rates from typhoid fever for the calendar year 1895 are given as follows:

Pittsburgh, 77 per 100,000 population;

Cincinnati, 36 per 100,000 population;

Louisville, 77 per 100,000 population.

On the other hand, in New York, Boston, and Brooklyn, which depend upon impounded water gathered in large reservoirs and carried in storage for many months, the typhoid fever death-rates are, by the last reports, shown to be:

New York, 17 per 100,000 population;

Boston, 28 per 100,000 population;

Brooklyn, 16 per 100,000 population.

And in Vienna and Munich, where the water is obtained from springs in mountainous districts, the death-rate from typhoid has been reduced to 7.0 and 7.1 respectively per 100,000 population.

Where a city's water supply is available only from sources

within reach of sewage and drainage contamination, the best methods in vogue for the purification of the water should be adopted. The water, before distribution to the people for domestic uses, should be subjected to such treatment as to make it comply with the requirements of the highest practical standards for purity.

Sedimentation and filtration may not furnish chemically and bacterially pure water, but viewed from a practical standpoint such water will be so far advanced in purity and in the arrest of disease germs that no one can object to its use for all purposes. The purification of polluted river water obtained by filtration combined with proper subsidence has accomplished the most satisfactory results. The introduction of filters at Hamburg is credited with reducing the death-rate from typhoid fever from 28 to 6 per 100,000 population. After the filters of the London waterworks were operated to meet the requirements of a bacterial standard, the typhoid rates fell from nearly 90 deaths per 100,000 of population for the decade 1861–70, to 24 for the decade 1871–80, 19 for the decade 1881–90, and finally to 15 per 100,000 of the population for the period 1890–94. In a recent discourse by Dr. Frankland before the Royal Institution of London, referring to the uniformly excellent filtration that had been reached in the water supply of London since filtration was made compulsory in 1856, he said, "that the effect of sand filtration, as carried out by the London water companies, upon the living matter contained in raw water was simply astounding. A single drop of unfiltered Thames water sometimes contained nearly 3,000 separate living organisms, but after filtration only two or three would be found, and sometimes the filtered water was absolutely sterile."

Mr. Hazen, the late chemist of the Massachusetts State Board of Health, states that "in parts of Germany, where the water is of exceptional purity and under governmental control, typhoid fever has ceased nearly to exist."

The change of source from the two-mile to the four-mile intake crib of the Chicago water supply reduced the typhoid fever death-rate from 104 in 1892 to 42 and 31 in 1893 and 1894, respectively, per 100,000 population. In fact it is established that the spread of diseases, such as cholera and typhoid, through the agency of drinking-water is occasioned by living organisms of extreme minuteness; and vital statistics furnish conclusive proof that high quality of water supply goes hand in hand with low typhoid fever rates and a general betterment of the public health.

The Louisville Water Company is at present making tests of the various systems of filtration and is exhibiting a commendable desire, by persistent and intelligent investigations, to ascertain the best method of purification, with the purpose to construct a filtration plant that will supply our people with a quality of water which, as far as practicable, shall equal the water of any large city in the country. When this is done the wells and pumps, of which we have 653—open or wood pumps numbering 532 and tube wells numbering 121—should be condemned and filled as fast as analysis shows them to be impure, and the use of hydrant water delivered through the public mains substituted. The changes in our domestic habits which involved the construction of sewers for conducting away the refuse from every house, have led to more or less contamination of the wells and pumps by infiltration from the sewers, receiving considerable of the sewage and all surface drainage. It is certain that money, labor, and study can not be spent to better advantage than in meeting the demand for a public water supply which, at least, shall not be the cause of disease and death in our households.

Water being universally recognized as the chief agency by which germ diseases are conveyed and disseminated, its purification, by a concensus of medical opinion, is regarded as the most efficient and promising instrumentality for the protection of the public health.

ANNUAL HEALTH REPORT.

LOUISVILLE, KY., August 31, 1897.

To the Honorable Board of Public Safety:

GENTLEMEN:—In submitting the report of the Health Office for the fiscal year ending August 31, 1897, I take the liberty of presenting a summary of the work accomplished by this office during the four years of my incumbency under your honorable body. Animated by an earnest wish to be able to grasp successfully with the various difficulties that surround this very important branch of the public service, my labors have been directed toward one common end—the promotion of the public health; and the gratifying results that have crowned these endeavors must, in a large degree, be ascribed to the ready advice and active co-operation received from the Board of Public Safety, working together with great advantage in making more secure, day by day, the life, health and comfort of every citizen.

With pardonable pride, the Health Office may claim to have secured during the past four years the original enactment, or material revision necessary for effective execution, or the rigid enforcement heretofore neglected, of the following ordinances pregnant with the highest consequences in safeguarding the public against the causes which produce and spread disease.

First—An ordinance concerning the sale of live stock for food, making it unlawful for any person, firm or corporation to sell or offer for sale, or to have in his or their possession for sale, any cattle, sheep, hogs, or any other animals for food, which is diseased, or in any wise unhealthy or unfit

for food. For the violation of this ordinance there is a penalty of not less than $25 nor more than $100 for each offense.

SECOND—An ordinance for the condemnation of diseased live stock or meat offered for sale for food, authorizing the Live Stock Inspector to condemn and have killed all such live stock, and deliver their carcasses to the dead animal contractor, and he is to make the same disposition of any diseased meat held or offered for sale. Any person interfering with or preventing the proper officers from executing the ordinance shall be fined for each offense not less than $10 nor more than $100. Under its operation during the fiscal year 1896 there were 724 diseased cattle killed and 4,514 condemned and sent out of the city; in 1897 432 killed and 1,576 condemned and sent out of the city.

Third—An ordinance to prevent the spreading of infectious and contagious diseases. This ordinance was prepared with great care to the end of intercepting, as far as practicable, the access and approach of disease generators. Being very elaborate and minute in its details, embracing sixteen sections, it is only possible to indicate its most salient provisions. It requires every physician to report forthwith in writing to the Health Department, and to give the name, age, sex and residence of every person within his professional knowledge who has diphtheria, diphtheretic croup, scarlet fever, small-pox or varioloid. Upon receipt of this notice the Health Officer shall cause to be placed on the house or premises where said case may be located, a placard, upon which shall be written in large letters the words "Diphtheria here," "Scarlet Fever here" (as it may be), and the display of a yellow flag for small-pox or varioloid; said placard or flag to remain for such time as the regulations of the Health Office shall designate for the destruction

or disinfection of infected bedding, clothing, etc. A fine or penalty is provided for the removal, defacement, destruction or concealment of said placard or flag before the time as above fixed. It shall be the duty of any one having in charge the body of a person dying of any of the above-named diseases to thoroughly disinfect and place such body in a coffin within six hours after being called upon to take charge of the same, if the call is made between the hours of 5 a. m. and 11 p. m., or otherwise, within twelve hours. The body of a person dying of any of these diseases shall not remain unburied for a longer period than thirty-six hours; and all funeral services in such cases must be private, the attendance limited to the immediate adult relatives, and the necessary number of adult pall-bearers. In no instance shall the corpse be taken into any church, chapel, public hall or building for funeral services. No child or other person residing on the premises where such diseases have been placarded or flagged, shall attend any public, private or parochial school, and this exclusion is to continue for twenty days following the recovery or death of the person last afflicted on the premises. Any one having control or custody of a minor or other individual, shall cause said minor or individual to be promptly and effectively vaccinated; and no principal of a school shall admit a child who has not been properly vaccinated, which fact must be shown by a certificate from the Health Office or a practicing physician. The effect of a vigilant enforcement of these precautionary provisions in reference to vaccination and the prompt isolation of small-pox patients is strikingly shown in the marked reduction of vaccinations found necessary each successive year; the number in 1894 being 8,039; in 1895 being 6,400; in 1896, 2,283; and in 1897 only 1,640. We may confidently expect the number of

vaccinations in the future to be practically limited by the number of children arriving at school age, and with a faithful observance, by those in authority, of this ordinance, our city may continue in its comparative exemption from this horrible scourge, which has so devastated other places. The germ theory of infectious diseases has become immensely practical and new possibilities are constantly looming up in public hygiene, and this ordinance was inspired by a firm belief in the increasing importance of preventive and remediary processes or agencies which arrest the diffusion of disease by circumscribing the sphere of the contagion.

Fourth—An ordinance authorizing the Health Officer to order the removal, abatement or prevention of any and every sanitary nuisance and specify a reasonable time within which it shall be done. In pursuance of this ordinance, during the fiscal year ending August 31, 1896, there were 2,187 nuisances abated and 1,163 vaults cleaned. For the fiscal year ending August 31, 1897, 7,115 notices were issued to abate nuisances and about 80 per cent. abated, and 986 vaults cleaned. Policemen are required to report the following nuisances: filthy alleys, filthy premises, dangerous gratings, filthy water-closets, dangerous cellar doors, cisterns not in use, foul cellars, foul vaults, dangerous buildings, water running into street or dry wells, where there is a sewer adjacent to the premises. The encouraging fact has been demonstrated that the prevalence of typhoid fever is not influenced so much by climatic conditions as by local unsanitary factors, and therefore to a great extent preventable.

Fifth—An ordinance concerning sewerage, compelling owners of occupied houses situated on lots abutting on a street or alley in which there is a public sewer to connect

drain pipes with said sewer. During the fiscal year ending August 31, 1896, sewer connections to the number of 485 were made by order from this office, and for the fiscal year 1897, 510 were made. The proper disposition of sewage has not been satisfactorily solved. There are advocates for its cremation and others for its utilization as a fertilizer. It is recently claimed that appliances have been invented by which ten tons of garbage, such as we have so much trouble in getting rid of in our cities, are made to be worth as much as a ton of coal for producing heat, light and manufacturing powers. Should this method for making such use of offensive wastes prove successful it certainly would be one of the greatest of modern discoveries.

Sixth—An ordinance making it unlawful for any one to throw or pour, or permit or cause to be run over any sidewalk, street or alley, any slop, refuse matter of any kind, filthy or hot water, steam water of any kind, impure liquids or offal of any kind.

Seventh—An ordinance regulating the sale of milk. First, a permit from the Board of Health, subject to approval by the Health Officer, is required, and this is granted only on condition that none but pure and undiluted milk be sold. Grocers and others offering milk for sale must expose in a conspicuous place the name of the dairyman from whom the milk is obtained. It is prohibited under heavy penalty for any person to offer for sale any unwholesome, watered or adulterated milk, or milk from cows that for the most part are kept tied up in stables, or fed on garbage, swill or other deleterious substance. When this ordinance was first put in force, inspection of samples of the milk taken from the carts, resulted in twelve dairymen being fined and published for selling adulterated milk. The knowledge that at any time, without notice, these

samples may be demanded for inspection, has promoted a salutary regard for the law and secured a notable improvement in the quality of our milk supply.

Eighth—An ordinance concerning the removal of stagnant water from vacant lots upon the inspection and condemnation by the Health Officer, or on the petition of two-thirds of the property owners, renters or residents on the square or block in which the stagnant water is located.

All of these ordinances have in view the better meeting of those sanitary problems which inevitably arise when large communities occur in close proximity, and it is the aim of the Health Office to enforce them without unnecessary harshness, but with strict impartiality and unbending regard for the public good.

In addition to these ordinances, it may be safely stated, that many improvements have been introduced in the management of the Health Office, such as the regular compilation and preservation of vital statistics and sanitary records, in a way to be easily examined and understood by those seeking such information. A variety of blank forms have been devised and printed, materially assisting and simplifying the work of the office and serving to preserve its records in a permanent and systematic form for future reference.

Especial mention may be made of the forms used for a physician's certificate of death, and the undertaker's certificate of burial, whereby a complete record is made; the one showing the full name of the deceased, with sex, color, married or single, age, date and cause of death; the other showing occupation, name of father and mother, place of birth, residence by number, street and ward, date and place of interment.

Recognizing that chief among the sanitary problems

pressing upon every city are those relating to water supply and sewerage, the efforts of this office have been steadily directed to guarding the public interest and the public health in its relation with a pure and adequate water supply, and the correction of objectionable methods of sewerage. Knowing contaminated water, frequently swarming with the germs of putrefaction and decay, to be a most fruitful factor in the causation and dissemination of disease, the Health Office has aimed to keep a constant supervision over the city's pumps, with frequent tests by careful analysis, and the prompt condemnation of all showing any dangerous contamination. The greater part of our public water supply comes from the Ohio river, and is furnished by the Louisville Water Company. Some time since, at my earnest suggestion, the Water Company connected its reservoirs with Beargrass creek, thereby enabling it to thoroughly flush and clean its basins. There is ample and indisputable evidence that with the introduction of a pure water supply, the general mortality in our cities has been largely reduced. For the past year the Louisville Water Company has been conducting extensive filtration tests, and it has just announced through its Board of Directors that it is prepared to consider plans and specifications for the construction and equipment of a plant best suited for filtering and purifying the water supplied to the city and citizens of Louisville, and the President expresses the hope of having the filters in operation before winter.

The interests of life and health in a great city are many-sided, and intimately concern, not the medical profession alone, but the industrial, the financial, the legal and other aspects of society as well. It is true that a city's means are limited, and it can only apportion them to the manifold demands as wisely as possible. Our city during the last

four years has made substantial progress in the recognition and promotion of the most advanced sanitary regulations, bringing to their solution both practical and scientific methods, and its mortality statistics furnish eloquent and conclusive arguments as to the success of sanitary reforms.

That our mortality per 1,000 population during the last fiscal year was only 14.4, will be best appreciated when compared with that of the following cities, as given by the report of July, 1897, issued by the United States Marine Hospital, Washington, D. C.:

Annual Mortality Report per 1,000 of Estimated Population.

New York city	20.86
Philadelphia	20.70
Boston	22.53
San Francisco	16.76
New Orleans	27.25
St. Louis	17.36
Baltimore	19.58
Cincinnati	16.90
Louisville, (fiscal year ending August 31, 1897)	***14.40***

Taking a period of twenty-four years, from 1874 to 1897, both inclusive, it appears from the following table, carefully compiled, that there were less deaths during the last fiscal year than in any year since 1891, and less deaths by typhoid fever than in any year since 1883. It also shows the remarkable fact that the number of deaths per 1,000 inhabitants for the last fiscal year was less than in any year of the city's history.

YEAR.	Estimated Population	Number of Deaths	Number of Deaths per 1,000 inhabitants	Deaths from Typhoid	Percentage of Typhoid Deaths to Total Deaths	Typhoid Deaths per 10,000 inhabitants	If Typho-Malarial Fever and Typho-Pneumonia be Classed with Typhoid Fever we would have				
							Deaths from Typho-Malaria	Deaths from Typho-Pneumonia	Total deaths from Typhoid	Percentage Typhoid to total deaths	Typhoid Deaths per 10,000 inhabitants
1874	110,022	2,476	22.5	68	2.7	6.0		15	83	3.4	7.5
1875	112,339	★									
1876	114,656	1,775	24.2	46	2.7	4.0	6	9	61	3.4	5.3
1877	116 974	1,989	17.0	44	2.2	3.6			44	2.2	3 8
1878	119,291	2,221	18.6	59	2.7	4.8	13	3	75	3.4	6.3
1879	121,608	2,580	21.2	75	2.9	6.1	11	19	105	4.0	8.6
1880	123,762	2,775	22.4	81	3.0	6.5	15	23	119	4.3	9.6
1881	127,475	2,761	21.6	135	5.0	10.0	11	21	167	6.0	13.0
1882	131,188	★									
1883	134,901	2,288	16.9	58	2.6	4.4	2	9	69	3.0	5.1
1884	138,614	2,851	20.6	155	5.4	11.2			155	5.4	11.2
1885	142,327	★									
1886	146,040	2,742	18.8	117	4.2	8.0			117	4.2	8.0
1887	149,753	2,862	19.0	120	4.2	8.0			120	4.2	8.0
1888	153,466	3,101	20.0	133	4.3	8.7			133	4.3	8.7
1889	157,179	3,192	20.3	144	4.5	9.0			144	4.5	9.0
1890	161,129	3,162	19.0	142	4.5	9.0			142	4.5	9.0
1891	165,500	3,087	18.6	130	4 2	7.8			130	4.2	7.8
1892	170,000	3,384	19.9	116	3 4	6.8			116	3.4	6.8
1893	175,500	3,266	18.6	135	4.1	6.7			135	4.1	6.7
1894	200,000	3,140	15.7	145	4.6	7.2			145	4.6	7.2
1895	205,000	3,369	16.4	126	3.7	6.1			126	3.7	6.1
1896	211,100	3,295	15.5	131	4.0	6 1			131	4.0	6.1
1897	215,572	3,105	14.4	93	2.9	4.3			93	2.9	4.3

★ No report.
Population from 1874 to 1880 based on United States census of 1880.
Population from 1880 to 1890 based on United States census of 1890.
Population from 1891 to 1897, inclusive, estimated from Caron's City Directory and other sources.

Respectfully submitted,

W. P. WHITE, M. D.,

Health Officer.

ANNUAL STATEMENT OF MORTALITY IN THE CITY OF LOUISVILLE,

FOR THE YEAR ENDING AUGUST 31ST, 1897.

CAUSE OF DEATH.	September	October	November	December	January	February	March	April	May	June	July	August	Total
Abscess of Brain,	1			1									2
Abscess of Liver,		2	1	2						1	1		7
Abscess of Lungs,				1									1
Abscess, all others,	2	1	2		3	2		2	3	1			16
Angina Pectoris,	1	1		4	1		1	1	1	2		2	14
Aneurism,						2			2	1			5
Anæmia,			2	1	2		1	1	3		1		11
Apoplexy,	5	6	2	9	3	4	7	4	7	7	2	2	58
Ascites,						3				1	2		6
Asthma,	4	6	6	4	4		6	7	1	5	6	2	51
Atelectasis Pulmonum,													
Appendicitis,	2		1	1	1			1	1	2	2	2	13
Anthrax,										1			1
Bowels, Obstruction of	3	2	1	2		1	2		2	1	1	4	19
Brain, Congestion of	7	5	6	3	1	2	6	1	7	4	4	8	54
Bronchitis,	5	7	5	10	14	9	6	4	10	9	4	5	88
Colitis, Tubercular		2		1									3
Calculi,	1												1
Cancer of Liver,		1			1				1	1		1	5
Cancer of Womb,		2		2		1	1		1	1		2	10
Cancer of Stomach,	2	2	1	1	2		2		1	2	3	2	18
Cancer, all others,	1	3	3	3	2	7	7	6	2	2	10	3	49
Cellulitis,										1			1

Cerebritis		1	1			1	1					1	6
Cholera Infantum,	5	1					1	1		10	15	9	42
Consumption,	39	27	26	43	29	41	62	39	34	33	34	34	441
Convulsions,	8	9	6	10	4	9	6	6	10	11	3	5	87
Cramp,		1		1				1					3
Cystitis,	1	1	1	2	1								6
Cholera Morbus,									1	1	1		3
Croup,	9	5	3	4	3	2	2			1			29
Cyanosis,		1		1	2	2	2			1			9
Diarrhœa, Acute	3	1		4		1		2				3	14
Diarrhœa, Chronic										1			1
Diabetes,				1		2	2			1		1	7
Diphtheria,	16	12	8	8	2		1	2	2		1		53
Dysentery, Acute	1		3	3	1	3	4	1	1	1	3	4	25
Dysentery, Chronic	2									1			3
Dropsy,	2	1	3	2		2	1	2	3	2	2	2	22
Debility, General	9	5	7	2	2	6	7	2	2	4	6	3	55
Enteritis,	4	4	6	1			1		1	3	3	4	27
Entero-colitis		1	1	1		2	2			3	13	5	28
Epilepsy,					1	1	2		1		1		6
Erysipelas,	2				1	2		1		2			8
Emphysema,	1								1				2
Embolism,	1							1		1			3
Endocarditis,		2		1		1	1		1	2			8
Encephalosis,											1		1
Empyemia,	1	1							1	2	4	1	10
Femur Fracture,										1		1	2
Fracture Skull	2	1	1								1		6
Fever, Puerperal		1	2				1				1		5
Fever, Remittant	3		1	2			1		2	1	1	2	13
Fever, Scarlet	1	1		1	1								4
Carried forward,													

MORTUARY REPORT—Continued.

CAUSE OF DEATH.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	Total.
Brought forward													
Fever, Typhoid	16	10	3	7	7	5	5	7	6	5	4	18	93
Fistula,	1								1				2
Gangrene,	1						1				2	1	5
Glottis, Œdema of		1	1		1								3
Gastritis,		1	2	4	2	1			3	2	2	4	21
Gastro Enteritis,					1					1	1		3
Heart, Fatty Degenerat'n,	2				3							3	8
Heart Disease, Organic	17	17	15	19	18	19	19	18	13	22	9	12	198
Hemorrhage of Bowels,				1					2				3
Hemorrhage of Lungs,	1			1	1	1				1	1	4	10
Hemorrhage, all others	3	7	6	4	10	3	4	2			2		41
Hodgkin's Disease,					1		1						2
Hernia,	2	3		1		2	1	2	1	2		2	16
Hydrocephalus,			1	2	1	2	1	1	1	1			10
Hepatitis,	1	2	3	1	2		2	1	2	1	2	2	19
Inanition,	14	19	6	13	10	13	14	4	5	21	15	16	150
Influenza,					1	2							3
Intemperance,		1	2	1						2	2		8
Icterus,											1		1
Jaundice,					1	1			2				4
Kidneys Bright's Disease of	6	8	4	3	3	2	3	3	1	7	6	2	48
Kidneys, Inflammation of			1			1				2	2		6
Lagrippe,			3	3	3	6	1		2				18

Lungs, Odœma of		2	1		3		1			1				8
Laryngitis,		3	1	1		1	2			2				10
Leucocythemia,								1	1		1			3
Liver, Cirrhosis of	1	1	2	3	3	3	5	3	3	1	3	1		29
Liver, Inflammation of	1	2	1	1				1	1		1			8
Lungs, Congestion of		2	3	3	1					2				11
Locomotor Ataxia,				1										1
Mania,				1		1	1	2	2		3			10
Marasmus,	5	4	3	1	2	1	2	3	1	3	3	1		29
Measles,						4								4
Meningitis, Cerebral	4	7	6	9	10	15	13	2	6	16	12	6		106
Meningitis, Cer. Spinal,										1				1
Myelitis,		1	1											2
Neurasthenia,		1	1	1						1	1			5
Nephritis,	1	2	5	6	5		11	3	3	6	2	4		48
Œsophagus, Stricture of		1												1
Old age	1	12	6	6	12	8	10	7	7	6	6	9		90
Paralysis,	4	3	7	5	6	7	10	6	1	6	4	7		66
Peritonitis,	3	3	5	2	7	2	6	5	1	4	1	5		44
Pleurisy,					1	1		1		5				8
Pneumonia,	25	12	11	29	44	39	53	20	15	12	5	5		270
Pyæmia,	1								2	2				5
Pericarditis,			1				1		1	1	1			5
Pertussis,							2		2	1				5
Pyelitis,						1								1
Rheumatism,	3		1		1	1		1						7
Rickets,	1		1						1		1			4
Sarcoma,				1										1
Scrofula,								1						1
Septicæmia,	2	2	5	2	2	5	3	3	2	7	5	4		42
Softening of Brain,		1		1	3		1			1	1	1		9
Carried forward,														

MORTUARY REPORT—Continued.

CAUSE OF DEATH.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	Total.
Brought forward,													
Sunstroke,										1	9	1	11
Shock,			3	4	2			1		5	2	4	21
Syphillis,				2					1				3
Spinal Disease,				1			2		1				4
Tonsillitis,	1												1
Tumor, all others					1	1						1	3
Tuberculosis,	2												2
Trismus Nascentium,				1	1		1	1	1	1			6
Thrush,								1					1
Tolanus,							1		1		1		4
Ulceration of Stomach,			1	2								1	4
Ulceration, all others			1	1	1	1	1						5
Uræmia,	2	6		5	2		5	3	5	5	3	1	37
Unknown,				1	2	2					4	5	14
Whooping Cough,								1		2	1	3	7
Accident, Drowning,	2		2	2			1		1	4	5		17
Accident, Burns and Scalds	1		1	2	1	4	1		1		2		13
Accident, all others	1	2	1	2	2	2	1	2	2	1	2		18
Accident, Railroad	2	2	2	2	1	2	2	1	2				16
Homicide,	3	2	4				3	2	1	9	3	3	30
Poisoning,	1	1	1		1	2		1	1	2	3		13
Suicide,	1			2	1		2			1			7
Total,													

SEX.

SEX.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August	Total.
Male,	143	145	107	147	134	137	177	97	113	164	142	113	1619
Female,	134	112	116	146	127	130	152	93	100	136	119	121	1486
Total,													3105

COLOR.

White	221	196	161	202	198	191	247	135	145	216	198	184	2295
Colored,	56	61	62	91	63	76	82	55	67	84	63	50	810
Total,													3105

SOCIAL RELATIONS.

Single,	18	162	154	172	162	174	190	109	140	163	144	146	1897
Married,	79	86	65	104	89	82	121	75	65	114	101	77	1058
Not stated,	17	9	4	17	10	11	18	6	8	23	16	11	150
Total,													3105

NATIVITY.

Louisville,	157	134	98	147	113	127	163	95	99	155	132	120	1540
Other parts of U. S.	54	76	78	80	73	76	82	52	62	78	59	51	821
Ireland,	10	17	16	15	13	16	20	6	7	8	13	9	150
Germany,	32	24	21	31	36	28	30	22	22	35	31	28	340
England,	9	. . .	2	4	2	1	3	1	1	1	2	1	27
France,	. . .	. . .	. . .	. . .	2	. . .	. . .	1		. . .	1	. . .	4
Other foreign countries,	3	1	. . .	4	4	2	7	2	. .	2	3	4	32
Unknown,	12	5	8	11	18	17	24	11	22	21	20	21	191
Total,	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	3105

AGES.

Under 1 year,	57	46	34	45	41	49	62	25	26	71	52	50	558
From 1 to 2 years,	19	11	3	13	13	9	12	8	10	8	13	9	128
" 2 to 3 years,	9	10	5	9	7	13	8	2	10	6	4	4	87
" 3 to 4 years,	3	4	5	5	4	5	6	1	4	3	10	1	51
" 4 to 5 years,	8	5	5	4	3	7	3	2	4	3	4	4	52
" 5 to 10 years,	4	7	10	10	7	7	6	6	8	6	6	2	79
" 10 to 20 years,	22	16	19	19	16	13	18	13	15	27	13	10	201
" 20 to 30 years,	34	36	19	36	26	28	41	20	38	28	29	31	366
" 30 to 40 years,	27	24	25	30	30	25	44	25	17	34	25	26	332
" 40 to 50 years,	22	24	18	23	22	24	30	26	18	26	24	20	277
" 50 to 60 years,	21	24	21	38	30	30	31	19	21	41	34	20	330
" 60 to 70 years,	22	16	24	34	33	21	31	17	20	19	24	20	281
" 70 to 80 years,	21	21	27	17	19	26	21	17	12	18	14	18	231
" 80 to 90 years,	6	7	8	4	8	8	9	9	9	6	1	10	85
" 90 to 100 years,	. . .	1	. . .	1	1	2	4	. . .	. . .	. . .	1	4	14
Not stated,	2	5	. . .	5	1	. . .	3	. . .	1	4	7	5	33
Total,	. . .	. . .	. . .	. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	3105

WARDS.

WARDS.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	Total.
First Ward,	29	36	19	37	20	32	24	22	21	26	18	27	311
Second Ward,	20	9	13	15	20	11	18	10	13	20	12	16	177
Third Ward,	20	10	15	18	13	20	22	7	19	21	20	12	197
Fourth Ward,	21	11	11	11	6	9	10	10	9	25	27	24	174
Fifth Ward,	16	33	25	35	28	31	39	21	18	25	13	26	310
Sixth Ward,	17	6	4	12	13	10	11	7	8	13	12	15	128
Seventh Ward,	10	11	11	11	8	6	16	3	9	14	12	10	121
Eighth Ward,	9	8	9	12	11	16	26	10	10	14	18	11	154
Ninth Ward,	11	14	9	14	10	19	25	10	13	16	20	10	171
Tenth Ward,	28	26	19	24	23	14	25	14	11	26	28	20	258
Eleventh Ward,	45	32	40	40	28	35	37	25	30	36	38	27	413
Twelfth Ward,	33	37	36	47	48	34	48	40	32	45	30	35	465
City Hospital,	5	6	5	8	12	19	7	5	9	9	6	. . .	91
Other Institutions,	. . .	3	3	4	10	7	6	. . .	1	. . .	1	. . .	35
Not stated,	13	15	4	5	11	4	15	6	10	10	6	1	100
Total,	277	257	223	293	261	267	329	190	213	300	261	234	3105

Population, 215,572. Death-rate for the year, per 1,000 inhabitants . . . 14.4.
White, . . . 175,410. Death-rate . . . . . 13.6.
Colored, . . 40,162. Death-rate . . . . . 20.0.

A. V. OLDHAM,
Secretary.

W. P. WHITE, M. D.,
Health Officer.

HEALTH OFFICE,

LOUISVILLE, KY., September 8, 1897.

(Published in Courier-Journal September 9th, 1897.)

To the Public:

In a communication, bearing date September 6, from Charles R. Long, President, to the Board of Directors of the Louisville Water Company, and published in to-day's *Courier-Journal*, exception is taken to the statement in my annual report that "some time since, at my earnest suggestion, the Water Company connected its reservoirs with Beargrass creek, thereby enabling it to thoroughly flush and clean its basins." President Long claims and asserts it "as a matter of fact and of record on the minutes of this Company that all necessary preparation for the cleaning of the reservoirs was made before Dr. White became the Health Officer," and, "the work of cleaning said reservoirs was not done at the suggestion of Dr. White or any one else." Having no desire to do any injustice to President Long and the Water Company, or anywise to detract from what is due them, I beg to submit a brief account of my official connection with the cleaning of the reservoirs, and upon which I felt justified in making the statement to which President Long objects. At the very threshhold of my entrance into the Health Office, in September 1893, I encountered complaints against the public water supply furnished by the Louisville Water Company, and it was not long before it was alleged that portions of decayed fish were passing through the hydrants. Calling the attention of the Mayor and Board of Safety to the matter, I was instructed to see President Long and request that prompt steps be

taken to correct this deleterious condition of the water. I failed to see President Long, but Mr. Hermany, the Chief Engineer of the Company, promised to, and within a few days did, flush the water mains through the fire cisterns and sewers into the river, which process he was satisfied would effectually get rid of the fish. Firmly holding it necessary for a pure water supply that the reservoirs should be thoroughly cleansed, this, so far as I was advised, not having been done since their construction, I called on President Long and urged that at the earliest practicable date the Company arrange to do this. I was surprised and pained to see President Long manifest considerable impatience with my request, saying that I was the first Health Officer to interfere with the Water Company, and having accommodated me by flushing the mains, he would do nothing more. The result was reported to the Mayor and the Board of Safety, who again instructed me to renew my demand for the cleaning of the reservoirs and to persist until it was complied with. I obeyed instructions and had another, and possibly, two more conversations with President Long, neither differing essentially from the first in securing any promises from him. President Long, nor Mr. Hermany, did not in any of these interviews (which occurred in the latter part of 1893 and the early part of 1894) intimate that the Water Company even contemplated cleaning the reservoirs, and much less made known that "all necessary preparations for the cleaning of the reservoirs were already made." If such was the case, as President Long now asserts, why did he not say so? Certainly, a simple statement of that fact would have been entirely satisfactory, not only to the Mayor and Board of Public Safety, but most welcome news to a patient and long-suffering public.

The minutes of the Water Company were not open to my inspection. I had no knowledge or any information from President Long or other official of the Water Company upon which to form a belief that the Company intended to clean

the reservoirs. President Long may be laboring under the false impression that in some mysterious way, probably telepathy, or otherwise than ordinary and recognized ways, he communicated to me that his Company was actively engaged in doing what I was so earnestly pleading for; but I can assure him that I left his presence each time with a heavy heart, feeling that I had failed in my mission. However, some time about the 10th of July, 1894, meeting President Long on the street, to my agreeable surprise, he informed me of the completion of the work of connecting the reservoirs with Beargrass creek by a drain pipe of sufficient capacity for thoroughly draining the reservoirs, and, I am happy to say, in a few days one of the basins was cleaned, and the other the following year.

Whether I had anything to do "in shaping or influencing the action of the Louisville Water Company in the premises," I leave for the public to say on reading the above presentation of the facts. In my own judgment, I do not feel that the statement in my annual report, which seems to have given offense to President Long, is too strong, but is fully sustained by the history of my connection as Health Officer with the matter at issue.

W. P. WHITE, M. D.,
Health Officer.

AREA OF CITY, EXTENT OF PUBLIC IMPROVEMENTS, ETC.

Area of City in square miles	20.5
Number of Acres	13,120
Appraised Value of Real Estate	$89,185,000
Total Valuation	$126,000,000
Estimated Population	215,572
Streets paved, miles	155.86
Streets paved and unpaved, total miles	286
Sewers, miles	81.79
Public Schools. number	54
Teachers of Public Schools	551
Pupils	24,617
Cost of said Schools annually	$526,360.10
Private and Parochial Schools	60
Churches in City	173
Hospitals, Asylums and Homes	46
Telephones	2,800
Water Mains, miles	202.25
Daily Pumping Capacity of Water Supply, gallons	30,000,000
Pumps in City	650
Gas Mains, miles	153
Street Car Tracks, Electric and Horse, miles	100
Street Car Tracks outside City Limits, miles	40
Public Parks, total acreage	1 079.18
Cost of Parks original	$348,435.45
Newspapers and Magazines	54
Electric Light Companies	2
Manufactories	2,040
Capital Invested	$45,000,000
Employes	30 000
Average Annual Wages	$12,000,000
Average Annual Output of Factories valued at	$48,000,000
Engine Companies	17
Hook and Ladder Companies	5
Water Tower	1
Men	197
Salvage Corps Men	10
Police Department	282
Elevation above sea level	525 feet.
Voters registered	47,646
White	38,076
Colored	9,570
School Children, estimated	82,052
Buildings Erected	1,517
Clearing House Reports	$306,077,753

The Falls of the Ohio River from First to Thirtieth Streets.

At 2.5 foot Stage the fall is 26.6 feet.
At 7.5 foot Stage the fall is 21.3 feet.
At 46.7 foot Stage the fall is 1.6 feet.

SALES OF LEAF TOBACCO IN THE LOUISVILLE MARKET DURING THE PAST 12 YEARS, AND APPROXIMATE VALUE OF SAME.

	HHDS.	VALUE.
1884	80,581	$ 7,750,000
1885	127,123	9,500,000
1886	125,556	9,500 000
1887	135,220	10,500,000
1888	90,069	10,750,000
1889	132,702	8,000,000
1890	144,612	10,750,000
1891	154,819	11,000,000
1892	162,529	12,500,000
1893	137,088	10,500,000
1894	191,640	11,157,440
1895	174,885	10,150,000
1896	165,749	9,500,000
Totals	1,793,573	$130,807,540

Average weight of hogshead of tobacco is 1,400 pounds. Louisville is the largest market in the world for Tobacco, the manufacture of Copper Whiskies, Cement, Plows, Fine Oak Sole Leather, Jeans and Jeans Clothing, Cast Iron Water and Gas Pipe, and Hickory Handles.