

Alan Ira Gordon, "Cholera in Worcester: A 19th -Century Public Health Movement"
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NOTICE.

PREVENTIVES OF

CHOLERA!

Published by order of the Sanitary Committee, under the sanction of the
Medical Council.

BE TEMPERATE IN EATING & DRINKING!
Avoid Raw Vegetables and Unripe Fruit !.

Abstain from COLD WATER, when heated, and above all from *Ardent Spirits*, and if habit have rendered them indispensable, take much less than usual.

SLEEP AND CLOTHE WARM !
DO NOT SLEEP OR SIT IN A DRAUGHT OF AIR,
Avoid getting Wet !

Attend immediately to all disorders of the Bowels.

TAKE NO MEDICINE WITHOUT ADVICE.

Medicine and Medical Advice can be had by the poor, at all hours of the day and night, by applying at the Station House in each Ward.

CALEB S. WOODHULL, Mayor
JAMES KELLY, Chairman of Sanitary Committee.

1849 Cholera Prevention Poster

Created by the New York Sanitary Committee, under the sanction of the Medical Council of New York City. Source: New York Historical Society, made available through Wikimedia commons, the free media repository.

Cholera in Worcester: A Study of the Nineteenth-Century Public Health Movement

ALAN IRA GORDON



Abstract:¹ *This study compares the municipal, medical, and social responses in Worcester to two national cholera outbreaks: the epidemics of 1849 and 1866. While public attitudes towards both epidemics demonstrate the misguided idea that cholera was a disease of moral intemperance, the medical and municipal responses to the later epidemic reveal a shift in emphasis from finding a cure to preventing the disease. When confronting the later epidemic, Worcester's municipal leaders mobilized resources to promote sanitation. Worcester's response to these two epidemics offers a case study of the important role cholera played in the rise of the public health movement in America. Alan Ira Gordon teaches in the Urban Studies Department at Worcester State University and is an urban planner.*

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Cholera is the classic epidemic disease of the nineteenth century. In successive waves of epidemics, it appeared in almost every part of the United States. Three major cholera pandemics swept across Asia, Europe, and North America in the mid-nineteenth century: in 1832-34, 1848-49, and 1865-66.²

The symptoms of cholera are both spectacular and terrifying. The onset of the disease is marked by diarrhea, acute spasmodic vomiting, and painful cramps. Dehydration accompanied by cyanosis, discoloration of the skin

caused by poor blood oxygenation, often gives the sufferer a blue complexion. Death may occur any time from a few hours to within a day of the first symptoms. Cholera can spread from any pathway leading to the human digestive tract. While unwashed hands or uncooked fruits and vegetables have at times been responsible for transmission of the disease, sewage-contaminated water supplies have been the major cause of the most severe cholera epidemics. The disease results from the colonization of the small intestine by the bacterium *Vibrio cholerae*.³

This study is an examination of the effects of the cholera epidemics of 1849 and 1866 on the nineteenth-century urban community of Worcester, Massachusetts. The purpose of this study is not to merely detail the ravages of this dread disease upon a particular community. Rather, by analyzing municipal response to the epidemic, local social attitudes, and the response of the local medical profession, this study offers a broader picture of the evolution of the public health movement and the practical utilization of medical science techniques within the nineteenth century urban environment.

The connection between cholera and public health movements in America is documented in the historical literature. In his seminal study of general American medical history, *Medicine In America-Historical Essays* (1966), Richard Shryock argues that cholera was the vital catalyst that inspired public health measures in the mid-nineteenth century.⁴ It was largely fear of this disease that prompted the organization of health departments in cities throughout America between 1830 and 1880. According to Shryock, the most alarming epidemic diseases of the nineteenth century were yellow fever, limited to the South after 1825, and cholera. It was these two diseases that aroused terror, and which therefore inspired public health measures to a greater degree than did the more devastating tuberculosis.⁵

In *The Cholera Years: The United States In 1832, 1849, and 1866* (1962), Charles E. Rosenberg argues that cholera epidemics of the nineteenth century provided much of the impetus needed to overcome centuries of government inertia and indifference in regard to problems of public health. According to Rosenberg, the cholera epidemics were transitory phenomena during which advances in public health and medical science were catching up with parallel evolutions in U.S. urbanization and the growing transportation revolution in U.S. metropolitan areas. Cholera represented a recurring stimulus against which the varying social and medical beliefs of Americans toward health could be judged.⁶ The public responses in Worcester to the 1849 and 1866 outbreaks offer an intimate portrait of municipal, medical, and social responses to disease.

THE 1849 OUTBREAK

In the mid-1840s, cholera spread from the region of West Bengal and Bangladesh, where it was endemic, throughout Asia and the Middle East. By July of 1847, it had reached Turkey, and a year later, it was in Berlin. In the fall of 1848, cholera appeared in England. The frequency of transatlantic shipping between Europe and North America made it inevitable that the disease would reach the United States. On December 1, 1848, a passenger ship from Le Havre, France, arrived in New York City laden with cholera-stricken passengers.⁷ Throughout the winter months of 1848-49, cholera spread among the port cities and urban centers of the United States. Yet it was in the warm months of the spring and summer of 1849, when unsanitary conditions were most evident in America's cities and towns, that cholera raged.

Concern over Worcester's lack of preparedness to deal with cholera was first voiced in an editorial in the *Worcester Palladium* on May 30, 1849. The editorial asked the reader to consider:

What have our municipal authorities done to save us from the visitation of so terrific a scourge? As yet in the Northern states, so far as the cholera has manifested itself, it has been in low and filthy localities, where the atmosphere has been corrupted by impurities. Such causes may be removed. When removed they should be kept away.⁸

Within the week, the municipal authorities moved to take preventive measures against the development of cholera in Worcester. On June 6, the City Council met and passed City Ordinance No. 39, titled "An Ordinance of Health," constituting ten sections of public health measures subject to authority within the municipal limits. The city ordinance was developed in accordance with Chapter 211 of the state laws of 1849, titled "An Act in Relation to Public Health." The act had been established by the Massachusetts Legislature on May 2. Prodded by public concern over the threat of the impending cholera epidemic, the state legislature ordered that local boards of health be established in cities and towns where they had not previously existed.⁹ This extension of the 1797 Board of Health Act specified a general procedure for the identification of sanitary hazards by either individual citizens, local health officers or boards of health, and provided a legal apparatus to permit the cities and towns to remove "any nuisance, source of filth, or cause of sickness" from private property.¹⁰

Sections 1-10 of Worcester City Ordinance No. 39 specified the following preventive public health measures:¹¹

The Mayor, President of the Common Council, and a Joint Committee of the City Council are constituted a Board of Health of the City of Worcester, with all powers vested in the Boards of Health by the general laws of the Commonwealth, and by Chapter 211 of the Laws of 1849.

It shall be the duty of the City Marshall to carry out all ordinances and rules made by the City Council and Board of Health relative to the sickness.

The Board of Health shall give notice of violations to owners or occupants of said dwellings in writing.

The Board may cause any persons occupying a tenement declared a source of filth to be removed therefrom, giving the owner or occupant at least 48 hours notice.

Vaults and privies shall be constructed at least two feet from every street, lane, passageway, or public space.¹²

All house, dirt, filth, rubbish, and waste matter collected by the City Marshal shall be removed at the expense of the owner or occupant of the place where such offense may be.

All persons who offend sections five and six of this ordinance shall pay for each offense a penalty of not less than one and not more than twenty dollars.

It shall be the duty of the City Marshall to keep a record of all expenses, costs, and outlays in carrying out the provisions of this ordinance.

The Common Council shall annually in March or April, choose some suitable person to be City Physician, who shall remain in office until another is appointed in his stead.

All ordinances inconsistent with the provisions of this ordinance are hereby repealed.

City Ordinance No. 39 reflects several weaknesses inherent in the municipal authorities' preparation for the coming of cholera, which would become all too apparent by the late summer. The constitution of the Board of Health reflected a lack of cooperation between the municipal authorities and the local medical profession. Not a single physician sat on the board. Rather, the mayor, president of the Common Council and five city councilmen—all non-physicians—directed Worcester's public health efforts. The 48-hour eviction notice for violators of the sanitary ordinance hindered progress in carrying out preventive public health measures. Considering the late date at which the ordinance was enacted, the utmost promptness in adhering to sanitary regulations was vital to the welfare of the populace. Finally, the measure declaring that filth shall be removed at the expense of the owner or occupant often deferred compliance with the ordinance.

Nonetheless, two positive public health developments were enacted by the ordinance. The municipal authorities were for the first time dealing with an oncoming epidemic by instituting preventive measures, haphazard as they may have been. Second, the permanent municipal position of City Physician was established in response to the need for a permanent municipal medical source to deal with public health issues.

On June 7, the newly established Worcester Board of Health held its first meeting and ordered that "all inhabitants of the city are directed to attend to all nuisances, sources of filth, and cause of sickness, and to take particular care that their cellars shall be speedily and thoroughly cleansed, and their Privies, Sink Drains, etc., put in good condition."¹³ Yet as positive as the actions of the board were in facing the threat of cholera, the preventive measures detailed above were enacted too late in the warm season to prevent cholera from developing in Worcester.

During the summer months of July and August, Worcester newspapers reported the ravages of cholera throughout Massachusetts. Hadley Falls, in the western part of the state, was hit particularly hard by cholera. Within six weeks, more than 100 people were killed by the disease, with more than half of the town population fleeing to the countryside.¹⁴ Cholera was prevalent to a lighter degree in other cities throughout the state. By July 18, eighteen cholera deaths had been reported in Boston, and one each in Springfield, Lowell, and Fall River.¹⁵

An examination of Worcester newspapers printed during the peak cholera months of July and August reveals little evidence of the appearance of cholera in the city. Only one actual death by cholera was reported to the public, that of a printer named George Carr. However, the cause of Carr's death was immediately surrounded by controversy. On July 18, the *Massachusetts Spy*

reported that “a death by cholera occurred in Worcester yesterday morning. The subject was a printer who formerly worked in the city and came here from Boston a few days hence.”¹⁶ The *Spy* concluded that Carr probably imbibed the seeds of the disease in Boston.

The *National Aegis*, a local daily, disputed whether Carr’s death had been caused by cholera. In an editorial on July 25, the *Aegis* asserted that

“while the case of Carr resembled cholera, it was the opinion of some of our physicians that it was not the cholera. The attending physician states through the *Spy* that he can satisfy the other physicians of their error. We did but state what two of our best and most extensive practitioners had themselves stated.”¹⁷

The next day, the *Spy* responded to the *Aegis* with an editorial denouncing the credibility of the *Aegis* and defending William Workman, the attending physician in the Carr case.¹⁸ A letter to the editor of the *Spy*, written by Workman in defense of his diagnosis, was printed in the same issue.¹⁹ With the publication of the *Spy*’s retort and Workman’s defense, the matter was dropped from newspaper coverage.



Dr. William Workman, Worcester physician active in combating both the 1849 and 1866 cholera epidemics. Courtesy, American Antiquarian Society.

With the exception of the Carr case, the newspapers reported no evidence of cholera in Worcester during the summer of 1849. Yet an examination of the mortality rate for August and the causes of deaths as reported in the vital statistics of the city of Worcester reveals an altogether different picture of the public health situation in Worcester during August.

Nationwide, August was the peak month of the cholera epidemic of 1849. Garbage and filth festered in the heat of the year's warmest month, increasing unsanitary conditions in the nation's cities and towns.²⁰ Thus, August would have been the most likely month for cholera to appear in Worcester. According to the records of William G. Maynard, the city sexton, there were 117 deaths in Worcester during August of 1849.²¹ Of the dead, 74 were adults and 43 were children under the age of five. (Table I compares this death rate with the mortality rates in August of the surrounding years).

Table 1: Mortality Rates in Worcester, MA from 1845-1850

<u>Month</u>	<u>Year</u>	<u>Mortality Rate</u>
August	1845	. 34
August	1846	. 36
August	1847	. 28
August	1848	. 40
<i>August</i>	<i>1849</i>	<i>. 117</i>
August	1850	. 38

(Based on the records of City Sexton William G. Maynard)

The mortality rate for August 1849 was 193 percent higher than the same month's rate for the preceding year, and 208 percent higher than in August 1850. This evidence brings into question the newspapers' lack of coverage of any disease or epidemic problems in Worcester.

An examination of the causes of deaths listed among the mortality statistics for August raises further evidence that cholera prevailed in Worcester. Among the 74 adults who died in August, 27 were listed as having succumbed to dysentery, 9 reportedly died from bowel complaint, and 7 from cholera morbus, a generic nineteenth-century term often applied to non-epidemic gastrointestinal diseases.²² It is safe to assume that a majority of these 43 deaths were actually due to Asiatic cholera, the strain that prevailed in all major nineteenth-century cholera epidemics. According to Rosenberg, any cause of death listed as dysentery, diarrhea, cholera infantum (a non-contagious illness that shared some symptoms with cholera), or the like during the period of the 1849 epidemic is misleading and was actually Asiatic cholera. All diseases of the bowels had a tendency to be diagnosed by

attending physicians as cholera when that disease prevailed. For example, Rosenberg writes that a great number of Asiatic cholera deaths in New York City were listed in such misleading terms.²³

Thus, the question arises as to why the newspapers of the day contained only one disputed account of cholera death in Worcester when the mortality statistics suggest that cholera might have claimed between 43 and 86 lives in August of 1849. One logical explanation is that the newspapers, possibly in conjunction with the municipal authorities, hid the extent of cholera in Worcester in order to avoid causing panic in the city. Numerous accounts detail the social breakdown that occurred in many cities and towns, as people panicked and fled to the countryside in an attempt to avoid the epidemic.²⁴ It is possible that city leaders wished to avoid the occurrence of such an episode in Worcester and thus avoided public acknowledgement of any cholera cases in the city.

1849 RESPONSE TO THE EPIDEMIC

The beliefs held by Americans in 1849 concerning the predisposing causes of cholera, preventatives for the disease, and the treatment of cholera reveal much information about the social attitudes of Americans concerning disease. To a major extent, in 1849 cholera was seen in a non-scientific light. Most Americans believed that cholera was a moral problem, rather than a social health phenomenon.²⁵ Cholera was thought not to attack the prudent and industrious workingman. The vicious poor, the drunkard and idler, the prostitute and thief were its proper victims.²⁶

An examination of the advice offered to the public by the Worcester newspapers shows that these attitudes were prevalent in the city during the 1849 epidemic. Editorials in editions of all newspapers examined for this study warned that temperance, moderation, and care in the habits of life would lead to a happy exemption from the disease. A direct warning that cholera was caused by poor moral habits came from the June 27 edition of the *Worcester Palladium*. In a clipping titled "Spirit-Drinking and Cholera," readers were warned to be temperate in order to remain free from cholera.²⁷

The aforementioned case of George Carr serves as an example of the moral attitude in Worcester towards cholera. Accounts of the case describe Carr as a printer of intemperate habits who had come to Worcester on a celebratory spree from Boston. He was reported to have kept up his spree for several days, drinking freely and eating little or nothing until he came down with the cholera.²⁸ The *Massachusetts Spy* report that acknowledged Carr's death due

to cholera emphasized that generally overdrinking and/or overeating could be blamed for contracting the disease.²⁹

Cholera was also believed to be caused by atmospheric conditions and various types of food. The same May 30, 1849 editorial that urged the municipal authorities of Worcester to carry out preventive sanitary health measures also warned that certain foods were a predisposing cause of cholera: “We cannot conceive a greater provocative to disease than the immense amount of heated vegetables and unripe fruits that were last year brought here from the south, and used without consideration in the hot season when all such things should be scrupulously avoided.”³⁰ The *National Aegis* ran a notice in August that the prevailing nationwide epidemic was not Asiatic cholera, but one of three other kinds: billiosa, orientalis, or cicca. Billiosa was said to be caused by eating too much, too fast and eating too much animal substance. Orientalis was acknowledged to be epidemic, coming from too much nitrogen and hydro-sulpherate gas in the air. Cicca was supposedly



A late-19th century group portrait of Worcester physicians, including the prominent Dr. Thomas H. Gage (seated in left foreground). Courtesy, American Antiquarian Society.

produced by an overabundance of bile in the bowels and intestines.³¹ The *Massachusetts Spy* warned its readers that the development of cholera was tied to the prevalence of dampness and low altitudes. “In elevated, dry, and cloudy situations, there is little to fear from cholera,” it stated.³²

In addition to factors like diet and the environment, fear of cholera was reported to have often led to the contraction of the disease.³³ Throughout the summer of 1849, Worcester newspapers printed articles warning readers that fear of cholera often brought on the disease. In July, three people were reported to have died in Boston from cholera contracted through excessive fear.³⁴

THE MEDICAL RESPONSE

Various sects competed with the regular medical profession in the treatment of cholera. The most widespread of these was the homeopathic school of medical treatment. Homeopathy was a medical system founded in the late-eighteenth century by Samuel Hahnemann, a German physician. Its therapy was based on the assumption that diseases could be cured by drugs that caused symptoms in the well person similar to those of the disease. More important was the homeopathic conviction that the strength of a drug increased with dilution.³⁵

In Worcester, the *Massachusetts Spy* endorsed the homeopathic treatment of cholera. During the summer of 1849, the *Spy* printed articles that detailed the success of homeopathic treatment versus that of the more-established allopathic treatment.³⁶ In an editorial titled “The Homeopathic Treatment of Cholera,” the *Spy* endorsed four such treatments for the disease: various dilutions of camphor, one to six parts alcohol, veratrum (an herbal remedy), cuprum 6 (a form of copper), and sulphur 400.³⁷

Overall, homeopathy was comparatively inexpensive and at worst harmless.³⁸ The same could hardly be said of the traditional remedies of the medical profession. According to Rosenberg, the nineteenth-century physician had only one assurance in treating cholera: by recognizing the “premonitory” symptoms, the disease could be anticipated and cured. However, were the disease allowed to develop, all remedies would prove useless.³⁹

Yet something had to be done for those who fell victim to the dreaded disease. Calomel, a naturally-occurring chalky mercury mineral compound, was the most widely used cholera remedy.⁴⁰ The development of bleeding gums in the patient, a symptom of mercury poisoning, was seen by many physicians as an indication that the drug was working effectively. Calomel

was usually prescribed in conjunction with laudanum, cayenne pepper, or the plant-derived powder called jalop. When these prescriptions failed, many physicians seized upon anything novel which promised to cure. Such remedies included sulphur, strychnine, the plant-based remedy aconite, or morphine.⁴¹

The physicians of Worcester were fortunate to be organized in the Worcester District Medical Society. Established in 1794, the organization was one of the oldest medical societies in the United States.⁴² Membership included physicians from throughout Worcester County. Meetings were held at irregular intervals, usually four times a year, at which time a medical topic would be chosen for discussion. At the meeting of October 10, 1849, the discussion subject was the “malignant Dysentery” that had prevailed during the past summer.⁴³ As in the newspaper accounts and the vital statistics of Worcester, the physicians never actually used the word “cholera.” Perhaps they omitted the word for the same reasons the newspapers and municipal sources of the day did.

During the discussion, physician Benjamin F. Heywood noted that he had prescribed various treatments in dealing with the disease. The application of astringents had very little effect, while cloths wet with cold water applied to the bowels did have some effect. Heywood also prescribed a solution consisting of three grams of calomel, one half gram of opium, and two grams of camphor. In some cases, he tried a solution of sulphuric soda with laudanum.

Doctor William Workman added that he had also tried various treatments with no very decided effect. He used mercurial preparations and calomel, with calomel having the best effect during the first stages of the disease. Large doses of opium were also useful in some cases. Doctor Shernton (first name omitted from meeting minutes) mentioned that he had tried iodine as an external application in conjunction with opium internally.

Heywood noted that injections had not succeeded well in helping patients. However, in some cases an infusion of two grams of sulphuric iron to an ounce of water did well. In the treatment of young children, Heywood gave an infusion of opium in water.

Dr. Augustus Robbins of Holden noted that, in his experience, the cases had been more severe in children than in adults during the past season. Robbins treated his patients with a calomel-opium solution, and also found useful the application of blisters to the insides of thighs. He added that physicians labored under a disadvantage from a want of proper understanding on the part of those having the care of children: they almost universally gave too much food to the child.

The meeting closed with a brief discussion concerning the credibility of home remedies. Robbins believed that a great many of the severe cases of the last season arose from the home remedies used before the physician was called in for treatment. Thornton concurred, and added that the people relied too much upon the empirical remedies that victim's families used based on folklore or misunderstood observation.⁴⁴

The above discussion reveals much about the state of the medical profession in dealing with the epidemic of 1849. Physicians practicing in Worcester treated cholera in much the same manner as did physicians nationwide. Yet concern over cholera centered on the treatment of the disease rather than the importance of taking preventive measures or discovering the causes of the disease. Not once during the discussion did any physician mention the importance of dealing with cholera before the disease became rampant. In fact, the entire discussion took place several weeks after the cholera had abated, too late to aid in combating the epidemic.

Overall, municipal efforts, social attitudes, and medical practices used to combat the 1849 cholera epidemic in Worcester exemplify the antebellum lack of medical knowledge and misguided attempts in dealing with disease. The one bright spot concerning the epidemic was the impetus it gave toward the establishment of public health regulations and efforts within the urban community to combat threats to the health of the populace. By 1866, when the next wave of cholera would reach the Northeastern states, the state of public health efforts and the level of rational, scientific knowledge held by the medical profession had evolved to a greater degree, leading to a local response to the 1865 epidemic that differed greatly from that of the 1849 epidemic.⁴⁵

THE 1866 OUTBREAK

The cholera pandemic of 1865-66 reached the United States in the same manner as the cholera of 1849. Throughout the summer of 1865, cholera raged in England, France, and Germany. Again, the transatlantic crossing facilitated the transmittal of cholera to America. In mid October, the English mail steamer *Atalanta* docked in New York's lower bay with sixty cases of cholera among its passengers.⁴⁶ Response to the 1865-66 cholera threat by the municipal governments of cities throughout the United States was prompt and early. Many city governments, learning of the cholera raging in Europe, had already begun to take preventive measures against the disease before it reached America's shores.⁴⁷

In early October of 1865, the Worcester City Council authorized Rufus Woodward, the City Physician, to prepare a report recommending

preventive measures that the municipal government should take to prepare for the cholera.⁴⁸ On October 30, Woodward presented his report to the City Council. The report contained three major recommendations:

1. A committee of five physicians should be appointed to prepare sanitary regulations which should be observed by every citizen.
2. The sources of disease occasioned by hog pens, privies, etc. should be removed: streets and streams should be cleaned.
3. New drainage sewers should be installed, and old ones improved.⁴⁹

On November 13, the City Council met and adopted Woodward's recommendations. Doctors Heywood, Workman, Strong, Gage, and Woodward were appointed a committee to prepare proper instructions for the public based on the City Council's sanitary regulations. The City Council instructed that the regulations be printed in pamphlet form and liberally circulated. A Joint Special Committee on Sewers was established to oversee the removal of sources of disease and the upgrading of the Worcester sewerage system.⁵⁰

The city government's early preventive actions against the impending cholera epidemic were endorsed by one of Worcester's leading newspapers, the *Worcester Daily Transcript*. In an editorial on November 18, the *Transcript* warned that "cleanliness of person and cleanliness of our premises, and care about our diet, appear the duty of all."⁵¹

Mayor James B. Blake reiterated this belief in his inaugural address of January 1, 1866. Blake declared that

"the recommendation of personal cleanliness to our citizens by the city physician, will avail to little if we allow the entire sewage of our city to collect and spread its evaporating surface over an area of several acres, offering as it were, the facilities by which the atmosphere of a large and densely populated section of the city may be poisoned by the exhalations of its pestilential vapors. This subject of sewerage I believe to be the foremost and most important of any matter which can come before us for the coming year."⁵²

As such, Mayor Blake's remarks confirm that a major difference between the 1849 and 1866 municipal preparations to meet the onset of cholera was

the realization that the containment of sewage was vital in maintaining the health of the city's inhabitants.

Unlike during the previous epidemic, the city Board of Health did not wait until the advent of the summer cholera season to mobilize preventive measures against the disease. On March 26, 1866, the board issued a sanitation notice requesting that landlords and tenants “earnestly aid and co-operate with the city authorities in their endeavors to preserve the public health during the coming season, by removing from their premises forthwith all matter which may have a tendency to create disease.”⁵³ The notice was signed by the mayor and aldermen, who, together, constituted the Board of Health.

Two days later, on March 28, the Board of Health issued the following sanitary regulations for the city:

The City Marshal is directed to cause a thorough examination of the whole city, in order that accurate information may be had of its sanitary condition, and the necessary means taken of its improvement.



Worcester Mayor James B. Blake, City Chief Executive during the 1866 cholera epidemic. Courtesy, American Antiquarian Society.

When any nuisance or other source of disease is found, notice is to be served at once upon the owner, and in case of refusal or neglect for a period of 24 hours, the owner will be subject to a fine not exceeding \$20 for every day during which such violation is continued.

Each officer will be considered responsible for the sanitary condition of the section of the city to which he may be specially assigned.

All swine within the mile circle shall be removed from its limits on or before the first day of June, 1866, and shall not be returned to the limits herein specified before the first day of October, 1866.

The City Marshal shall keep a correct record in a book of all nuisances reported to him, and shall report the same to the Board of Mayor and Aldermen.

All persons acting under and by authority of this order, are hereby authorized to enter upon and into any premises which it may be necessary to visit in compliance with its provisions.⁵⁴

A comparison between this 1866 regulation and the 1849 Worcester City Ordinance No. 39 reflects an evolution in local government strategies toward the epidemic toward prioritizing preventative sanitary efforts.

Between April and August, the Board of Health intensified its efforts to prevent cholera from developing in Worcester. On April 26, the board issued the following special notice:

In order to effect the more speedy operation of removing from the City limits all sources of disease, the Board of Health would solicit the aid of the Farmers in the vicinity, or other persons, in removing the contents of vaults,⁵⁵ that the same may be accomplished as promptly as possible. Special licenses for this purpose will be granted to persons applying for the same at the Marshall's office.

Citizens requiring the removal of the contents of vaults, will please leave their names with place of residence, at the office of the Marshal, at an early day, that means may be provided them for carrying out the sanitary measures adopted by the Board."⁵⁶

The issuance of this notice represented a major advancement in the organization of public health measures in Worcester. For the first time, emergency public health officials, namely farmers, were solicited to aid the authorities in carrying out public health measures. Adherence to sanitary standards was seen less as the responsibility of the private citizen, and more as the duty of the city health authorities in conjunction with the private citizen.

Throughout the spring and early summer months of 1866, the Board of Health continued to enforce the sanitary regulations of Worcester. On June 27, the board declared several localities as unfit for habitation and ordered the occupants removed from the premises.⁵⁷ On July 11, the Board reported to the City Council in favor of the immediate establishment of suitable public baths.⁵⁸ On August 1, the board reissued the special ordinance of April 26, adding a provision for the removal of swill from the city limits.⁵⁹ Thus, by the beginning of August, the municipal authorities of Worcester had made intense efforts to carry out preventive public health measures.

It appears that the efforts of the local authorities were a success. Not a single cholera case was reported in the newspapers during the summer months. The vital statistics of the city for the month of August reveal a mortality total of 26 deaths, about average for the month of August in any year in the decade of the 1860s.⁶⁰ Not a single cause of death was listed as dysentery, bowel disorder, or cholera.

However, in terms of social attitudes toward cholera, little had changed between 1849 and 1866. To die of cholera was still a sign of moral indiscretion.⁶¹ As the *New York Times* expressed it: "Cholera is especially the punishment of neglect of sanitary laws; it is the curse of the dirty, the intemperate, and the degraded."⁶² Worcester newspapers stressed the same beliefs. The *Worcester Palladium* warned its readers that cholera could be traced directly to improper diet or to intoxicating drinks, or to both united.⁶³ The *Palladium* recommended the same course of treatment as that generally prescribed by physicians in 1849, including various mixtures of laudanum, camphor, rhubarb, mustard, etc.⁶⁴

Although the treatment of cholera had changed little since the epidemic of 1849, debate raged within the medical profession over the cause of it. Physicians nationwide debated between three doctrines of cause. Predisposition held that cholera was caused by an individual's moral behavior of sin or "impure" lifestyle. The contagionism theory postulated that the disease was borne by an "unhealthy atmosphere," while the emerging germ theory correctly identified the cause of the disease as microorganisms that grow and reproduce within their host.⁶⁵ Yet despite conflicting beliefs concerning the causes, physicians nationwide were beginning to realize that

the disease could be prevented through disinfection and quarantine. A new, emerging concept of public health, called sanitary reform, could be utilized to prevent cholera, if not to cure it.⁶⁶

The records of the Worcester Medical Association, an organization of city physicians, reflect this newfound belief in the importance of sanitary reform in preventing disease. On March 7, 1866, more than four months before the cholera season, the association met to discuss the taking of preventive measures against the appearance of cholera. A physician identified only as “Clarke” began the meeting by noting concern about the unsanitary condition of the local environment. He noted that Worcester’s population had doubled since 1849, the drainage of the city was in poor condition, and the tenements were more crowded than ever. Clarke suggested that the association recommend the establishment of one or more dispensaries during the summer months, with the money being furnished by the city. Doctors Martin and Woodward thought it advisable that the city government carried



Dr. Rufus Woodward, one of the five members of the City Council-appointed medical advisory committee for addressing the 1866 Worcester cholera epidemic. Courtesy, American Antiquarian Society.

out the recommendations of Woodward's sanitary report. In addition, they thought it advisable to urge the city government to cleanse the Blackstone Canal and the ponds of the city.⁶⁷

It is not known whether or not the city government carried out the recommendations of the association. Yet it is important to note that the physicians of Worcester were concerned with taking preventive measures to deal with cholera. Unlike the physicians of the Worcester District Medical Society of 1849, the members of the Worcester Medical Association of 1866 were willing to meet before the advent of cholera, discuss preventive measures, and face the reality of the cholera, rather than downplay the disease through a discussion of "malignant dysentery" after the disease had abated.

This comparative study of the cholera epidemics of 1849 and 1866 supports the thesis that cholera was the impetus that began the development of the American public health movement. In Worcester, measures taken in defense against the 1849 epidemic were of limited success. Efforts on the part of the municipal authorities began late in the cholera season and did not include the cooperation of the local medical community. In 1849, an estimated 43 to 86 Worcester residents died from cholera.

Yet several positive public health measures developed out of the struggle against the disease. For the first time, a Board of Health was established in the city to deal with urban health issues. The permanent position of City Physician was established in response to the need for a permanent municipal health authority to deal with urban health issues. Most important, the ravages of cholera emphasized the importance of carrying out early, concerted public health measures to deal with disease.

The epidemic of 1866 represented the first application of sanitary reform measures to an epidemic disease in an American urban environment. Although the medical profession, and society in general, still did not understand the causes of and proper treatment for cholera, Americans were becoming aware of the importance of correct sanitary habits in combating the occurrence of cholera epidemics. The growing concern for the urban populace's standard of health was reflected in the early mobilization of Worcester's municipal government in instituting public health measures, the growing cooperation between the local medical profession and the city government, and the emphasis placed by both physicians and politicians upon the importance of a proper sewage system.

In light of the positive public health developments that were instigated during both epidemics, the memory of cholera should not merely be that of a dreaded, usually fatal nineteenth-century disease. Rather, cholera should be seen as a landmark phenomenon, one that precipitated one of the most

important organizational developments in urban history: the evolution of sanitary reform and the public health movement in America. In this light, it can be seen that positive urban developments can evolve from the worst of our cities' problems. In the nineteenth century, Americans rose to the challenge of cholera and made the urban community a more healthful environment in which to live.

POSTSCRIPT

While periodic cholera pandemics have occurred to the modern day, the impact of the disease has been mitigated over time by the evolving understanding of the cholera bacterium, combined with advances in the public health movement in general. The 1881-1896 pandemic resulted in a quarantine that kept the disease out of the United States and Britain. However, as industrial nations succeeded in mitigating cholera's periodic impact, the disease continued to ravage the developing world. An 1899-1923 pandemic killed more than 800,000 victims in India alone before spreading into the Middle East and North Africa.⁶⁸

In 1961 the seventh historically documented, worldwide pandemic originated in Indonesia and spread over time throughout Asia, the Middle East, and Africa before making limited inroads into Italy in 1973. While this pandemic ended in the late 1970s, regional outbreaks emerged in the following decades, including a 1991 Peruvian epidemic that killed 10,000 people as it spread throughout South America. Concern for a future eighth pandemic is based upon the 1992 emergence in Bangladesh of a new cholera species designated as "cholera bacteria 0193," which subsequently has been detected in eleven different countries.⁶⁹

Modern public health practices have greatly reduced worldwide cholera deaths. Still, the World Health Organization (WHO) estimates that as of 2010, cholera annually infects an estimated three to five million people worldwide and causes 100,000 to 130,000 deaths, mainly in the developing world, as it flourishes in the aftermath of natural disasters that limit access to clean and safe drinking water.⁷⁰ Notable outbreaks in recent years include the October 2010 outbreak in Haiti in the wake of that country's disastrous earthquake, which resulted in at least 250 cholera deaths.⁷¹

Medical science efforts continue to work toward eradication of this disease, with recent research evolving to include the analysis of how global climate pattern changes, including El Nino events, impact the frequency of cholera outbreaks.⁷²

To the Citizens of Worcester:

In consequence of the existence of Asiatic Cholera in a neighboring country, and of the possibility, perhaps probability, that its ravages may be extended to this place, your Selectmen have thought fit, with the approbation of our Physicians, to furnish all the families in this town with the following directions for the prevention of disease, and for the treatment of the sick until a physician can be obtained. While we trust, under Providence, that the disease, should it prevail here, will be divested of many of its terrific features, and rendered comparatively mild, by the general sobriety, cleanliness, and comfort of our citizens, we yet recommend that they be in possession of the remedies prescribed below, to be used with calmness, discretion, and entire self-possession, in all cases where they may be needed. We would particularly admonish all, that notwithstanding any suggestions to the contrary, all experience in this disease has shown, that the use of Ardent Spirits by the healthy greatly exposes them to the disease, and increases, in a high degree, the probability of its fatal termination.

By order of the Selectmen of Worcester.

CHARLES ALLEN, *Chairman*.
Worcester, June 22, 1832.

The Consulting Physicians of the City of Boston, having been requested by the Mayor and Aldermen to prepare some instructions for the relief of persons attacked with the Asiatic Cholera, before Medical advice can be obtained, and also for the prevention of this disease, report as follows:

There are two kinds of the Cholera cases, one excessively severe and sudden in its attack, the other comparatively mild. The former requires the immediate use of remedies: the latter may wait the attendance and advice of a physician.

The symptoms of the violent form, are great coldness, dizziness, sickness of the stomach and vomiting; diarrhea, small watery discharges, violent cramps in every part, and a livid color of the body.

The following remedies should be used directly, when the symptoms occur:

1st. Give for an adult 50 drops of laudanum in a wine glass of hot brandy and water, equal parts of each; and repeat it every fifteen minutes, until four doses have

been taken, so as to give in the whole 200 drops;—if thrown up repeat the laudanum in a teaspoonful of brandy.

2d. Apply bags of hot sand to every part of the body and limbs of the patient. Large woollen cloths wrung out of very hot water may be applied in the same way, provided they are kept from cooling.*

3d. Make a poultice or paste of common mustard mixed in the same way as for ordinary use. Apply this hot, over the whole surface of the bowels.

4th. Give an injection made with a gill of starch, arrow-root, or gruel, with one teaspoonful of laudanum in it.

Milder form of the Disease. This is often preceded by a looseness of the bowels and sickness at the stomach. When these symptoms come on, the patient should omit the use of solid food, and take as little as possible of any thing into the stomach. A proper nourishment in this state, arrowroot or rice water. For drink, small quantities of pure water or tea.

The patient should keep in bed. If the bowels have not been freely emptied, an even dose of powdered rhubarb may be given. This is to be followed by an injection, every four hours, of half a pint of flaxseed tea with 20 drops of laudanum in each. The surface of the bowels should be blistered. If the patient is much exhausted, a teaspoonful of tinct. of cinnamon in half a wine glass, full of hot water, may be given, once in half an hour, for three or four times.

Means of Prevention. Cleanliness, domestic and personal, is of the first importance in the prevention of Cholera.

Every house and shop, especially provision stalls, should be made clean and sweet. Outhouses should be freed from all offensive matter. Cellars especially should be cleared of putrid vegetables, ventilated, and thoroughly dried. Beds and bed clothing should be daily exposed to currents of fresh air.

Personal cleanliness must be carefully attended to. Those who can do so, should in hot weather, bathe in sea water two or three times a week, and others should wash the whole body with warm water and soap, at least twice a week. Children should not be omitted in this process. As few individuals as possible, should live in the same room, and where a number are found together, means for dividing and giving them more healthy lodgments should be provided at the public expense.

Crowded meetings, especially in the evening, should be avoided.

Food. In a disorder which affects the stomach and intestines, all attempts at prevention would be useless, without a most strict attention to food. A fact established by the experience of all Europe and Asia is that the "Cholera attacks the tripper" and makes him his first victim. A little excess, even in wine, exposes to the disease. Liquids of all kinds should be moderately used. The safest are common tea and teas made of domestic herbs, taken warm. Acid drinks

are pernicious. Cold water if pure, may be taken in moderate quantity, but when the weather is hot and the thirst great, the mouth, the hands, and the face should be previously washed.

Excess of solid food is a sure preparation for the disease. The best articles of food are bread, eggs, fresh meat, fresh fish, and rice. Perfectly good and thoroughly boiled vegetables stand next, as potatoes, asparagus, etc. All uncooked vegetables, as salads, are dangerous. Fruits, unless very fine, had better be avoided. Strawberries, taken by themselves, or with the addition of a little wine are the least likely to do mischief. Pastry, preserves, pickles, scarcely need be mentioned as requiring a total prohibition. All unusual fatigue and exercise; exposure to cold, wet, and to the night air, should be avoided. The dress should be carefully regulated according to the changes of temperature. Flannel next the skin is universally recommended, and to those of a more delicate habit is indispensable.

What we have already said on the subject of ventilation, will make it sufficiently understood that we believe the pure air of the country to be more salutary during the hot season, than that of a large town. While, therefore, it is not indispensable to flee the City on the appearance of the Cholera, and while we doubt not it will pursue a different course from yellow fever, and infect the country if it does the town, we should advise those who have the means of selecting their residence, to quit the frequented walks of men, and seek retirement and sequestration, during the prevalence of the epidemic.

Finally, we recommend a *good conscience and a fearless performance of duty*, as the best of all preservatives against this disorder. It is well known to physicians that the most timid are most frequently the subjects of epidemic diseases. This is peculiarly the case with Cholera, because it affects the nervous system. We, therefore, strongly urge on our fellow citizens, a perfect confidence in the wisdom and goodness of God, and a full assurance that those who perform His will by the devotion of their labors to the sick and suffering, are taking the surest means to escape the attack of this disease.

Signed,
JOHN C. WARREN.
BENJAMIN SHURTLEFF.
GEORGE C. SHATTUCK.
GEORGE HAYWARD.
JOHN RANDALL.

*In the use of fomentations with hot cloths, unless great care is taken to wring them very dry, and to avoid wetting the bed, more harm than good may be done. The tendency of much moisture is to convey off heat with rapidity, in which case an effect, the reverse of that intended, may be produced. The better mode is, to dip billets of wood in boiling water, and wrap them in flannels and apply them to the patient. This mode secures all the advantages of the other, and avoids the danger to be apprehended from too much moisture in the bed.

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Notes

1. This article was originally published in the *Worcester Medical News* (a journal published by the Worcester District Medical Society) 46.3 (May-June 1981): 10-16. It has been modified, expanded, and updated from its original version.
2. Charles E. Rosenberg, *The Cholera Years: The United States in 1832, 1849, and 1866* (Chicago: University of Chicago Press, 1962), 4.
3. Rosenberg, 3.
4. Richard Harrison Shryock, *Medicine in America: Historical Essays* (Baltimore: Johns Hopkins Press, 1966), 15. For more recent studies see: Christopher Hamlin, *Cholera: The Biography* (New York: Oxford University Press, 2009); Sandra Hempel, *The Strange Case of the Broad Street Pump: John Snow and the Mystery of Cholera* (Los Angeles, University of California Press, 2007); Pamela K. Gilbert, *Cholera and Nation: Doctoring the Social Body in Victorian England* (Albany: State University of New York Press, 2008); Steven Berlin Johnson, *The Ghost Map: The Story of London's Most Terrifying Epidemic and How It Changed Science, Cities, and the Modern World* (Penguin Group USA, 2006). The following major books also have chapters on cholera: H.N. Hays, *The Burdens of Disease: Epidemics and Human Response in Western History* (New Brunswick, NJ: Rutgers University Press, 2010); Sheldon Watts, *Epidemics and History: Disease, Power and Imperialism* (Wiltshire: Yale University Press, 1997); and William H. McNeill's classic study, *Plagues and Peoples* (New York: Anchor Books, 1977).
5. *Ibid.*
6. Rosenberg, 2. See also Owen Whooley, *Knowledge in the Time of Cholera: The Struggle over American Medicine in the Nineteenth Century* (Chicago: University of Chicago Press, 2013).
7. Rosenberg, 101.
8. *Worcester Palladium*, May 30, 1849, 2.
9. Barbara Gutmann Rosenkrantz, *Public Health and the State: Changing Views in Massachusetts, 1842-1936* (Cambridge: Harvard University Press, 1972), 28.
10. *Ibid.*
11. *Worcester Palladium*, June 13, 1849, 3.
12. Multi-family tenement buildings of the era were commonly each served by a communal water closet (often referred to as either a privie or a "school sink") located outside of and adjacent to the tenement. The resulting human waste discharged into a vault, which periodically required pumping-out. Neglected vaults often tended to become clogged, resulting in waste back-up and overflow, hence the concern stated in the April 26, 1866 Worcester City Board of Health regulation prioritizing the importance of waste removal from vaults.
13. *Ibid.*
14. *National Aegis*, September 5, 1849, 2.
15. *National Aegis*, July 18, 1849, 3.
16. *Massachusetts Spy*, July 18, 1849, 3.
17. *National Aegis*, July 25, 1849, 2.

18. *Massachusetts Spy*, July 26, 1849, 2.
19. Ibid.
20. Rosenberg, 34.
21. *National Aegis*, September 5, 1849, 3.
22. Ibid.
23. Rosenberg, 114, note 35.
24. *National Aegis*, July 9, 1849, 2.
25. Rosenberg, 121.
26. Rosenberg, 133.
27. *Worcester Palladium*, June 27, 1849, 3.
28. *Massachusetts Spy*, July 18, 1849, 3.
29. Ibid.
30. *Worcester Palladium*, May 30, 1849, 2.
31. *National Aegis*, August 8, 1849, 2.
32. *Massachusetts Spy*, July 4, 1849, 3.
33. *National Aegis*, June 27, 1849, 2.
34. *National Aegis*, July 18, 1849, 2.
35. Rosenberg, 161.
36. *Massachusetts Spy*, July 18, 1849, 3.
37. *Massachusetts Spy*, July 18, 1849, 2.
38. Rosenberg, 161.
39. Rosenberg, 151.
40. Rosenberg, 66.
41. Rosenberg, 152.
42. Records of the Worcester District Medical Society, descriptive insert located in binder sleeve of the Records of the Worcester District Medical Society, Volume 1. This is a bound primary source volume of meeting minutes for the period of the 1840's, located in the Worcester District Medical Society Rare Book Collection within the Lamar Soutter Library at the University of Massachusetts Medical School, Worcester, Massachusetts.
43. Information pertaining to the October 10, 1849, meeting of the Worcester District Medical Society was derived from the *Records of the Worcester District Medical Society, Volume 1*. This is a bound primary source set of meeting minutes for the period of the 1840's located in the Worcester District Medical Society Rare Book Collection within the Lamar Soutter Library at the University of Massachusetts Medical School, Worcester, Massachusetts.
44. Ibid.
45. Between these two national epidemics, American soldiers confronted cholera during the Civil War, see Jeffrey S. Sartin, "Infectious Diseases during the Civil War: The Triumph of the "Third Army,"" *Clinical Infectious Diseases* 16.4 (1993), 580-584.
46. Rosenberg, 175.
47. Rosenberg, 185.
48. *Worcester Palladium*, October 2, 1865, 2.

49. *Worcester Daily Transcript*, November 1, 1865, 2.
50. *Worcester Daily Transcript*, November 14, 1865, 2.
51. *Worcester Daily Transcript*, November 18, 1865, 2.
52. City Document No. 20, 17. "City Document No. 20", p. 17. "City Document No. 20" was located in an untitled reference file of miscellaneous City of Worcester local 19th century government documents in the collection of the American Antiquarian Society (AAS), Worcester, Massachusetts.
53. *Worcester Palladium*, March 26, 1866, 3.
54. *Worcester Palladium*, March 28, 1866, 3.
55. Multi-family tenement buildings of the era were commonly each served by a communal water closet (often referred to as either a privie or a "school sink") located outside of and adjacent to the tenement. The resulting human waste discharged into a vault, which periodically required pumping-out. Neglected vaults often tended to become clogged, resulting in waste back-up and overflow, hence the concern stated in the April 26, 1866 Worcester City Board of Health regulation prioritizing the importance of waste removal from vaults.
56. *Worcester Palladium*, April 26, 1866, 3.
57. *Worcester Palladium*, June 28, 1866, 2.
58. *Worcester Palladium*, July 12, 1866, 2.
59. *Worcester Palladium*, August 1, 1866, 3.
60. *Worcester Palladium*, September 7, 1866, 3.
61. Rosenberg, 217.
62. *New York Times*, April 22, 1866. Qtd. in Rosenberg, 218.
63. *Worcester Palladium*, April 18, 1866, 2.
64. Ibid.
65. Rosenberg, 213.
66. Rosenberg 214.
67. Information pertaining to the meeting of March 7, 1866, of the Worcester Medical Association was derived from pages 52 and 53 of the Records of the Worcester Medical Association, 1886. This is a bound primary source volume of meeting minutes for 1866 located in the Worcester District Medical Society Rare Book Collection within the Lamar Soutter Library at the University of Massachusetts Medical School, Worcester, Massachusetts.
68. "Cholera's Seven Pandemics," CBC News/Health, October 22, 2010, www.cbc.ca.
69. Ibid. For an in-depth study of the 1991 Peruvian outbreak see R. I. Glass, M. Libel, and A. D. Brandling-Bennett, "Epidemic Cholera in the Americas," *Science*, (1992), 1524-1525.
70. WHO position paper in the *Weekly Epidemiological Record* 26, March, 2010.
71. "Cholera's Seven Pandemics," CBC News/Health, October 22, 2010, www.cbc.ca.
72. Rita R. Colwell, "Global Climate and Infectious Disease: The Cholera Paradigm," *Science* 20 (December 1996).