

## National Science Content Standards:

*A: Science as Inquiry*

*C: Life Science*

*F: Science in personal and social perspectives*

*G: The History and Nature of Science*

## OBJECTIVE:

To conduct an epidemiological investigation and use hypothetical victim case studies and evidence to determine the source of cholera in the Five Point's neighborhood of New York City. To develop an understanding of the science and methods of epidemiology by analyzing disease data and developing hypotheses.

## DESCRIPTION:

Students will act as disease detectives as they investigate the 1832 cholera epidemic that swept through New York City, most acutely in the Five Points neighborhood. Students will use victim biographies and other specific relevant details to analyze patterns of disease, human behavior, and contaminant exposure in order to hypothesize the cause(s) of the epidemic. As an extension, students will consider the economic and social aspects and impact of the cholera epidemic, and extrapolate from that understanding as they look at other more recent disease outbreaks.

## MATERIALS:

### One for each student: (see file: Potable Poison Student Instructions and Handouts 6-8)

- Student Instructions: Part 1
- Student Instructions: Part 2 – Analysis Sheet
- Cholera Victims Clue Card Summary Sheet
- Five Points Map

### One for each group of students: (see file: Potable Poison Group Handouts)

- Victim Clue Cards (cut sheets into individual cards, or distribute as sheets to the groups)
- Picture Card
- 12 colored pens or pencils (not included)

### For Instructors: (see file: Potable Poison Teacher Answer Keys)

- Teacher Information and Extension (included here with Assessment Questions and Further Reading)
- Five Points Map-Key
- Cholera Victims Clue Card Summary Sheet – Teacher Answer Key

## UNIT BACKGROUND for Teachers:

In the early 1800s, few understood disease. In the summer of 1832 a mass epidemic of cholera claimed the lives of 3,515 people in New York City. Experts now believe the source of this outbreak traced back to India, the location of the first cholera pandemic of 1817. This time, however, the disease left South Asia and began an extended and deadly world tour. Cholera spread via trade routes through the Middle East to Russia and by means of Russian military to Eastern Europe, and finally to Paris by the spring of 1832. Despite strict quarantines and other trade restrictions, cholera had spread through England by April 1832 and in early June found its way to Canada, perhaps crossing the Atlantic in ships' bilge water. Within weeks, the disease had traveled down from Quebec through the

state of New York to New York City where it killed thousands in a matter of months.<sup>1</sup>

Cholera is an acute diarrheal infection caused by the bacterium *Vibrio cholerae*. It is most often transmitted by water contaminated with feces from someone contaminated with the virus. Every year, there are an estimated 3–5 million cholera cases and 100,000–120,000 deaths due to the disease, according to the World Health Organization.<sup>2</sup> While cholera is far less of a threat to the developed world now, it remains a challenge to countries where citizens lack access to safe drinking water and adequate sanitation. Sanitation conditions in the world's major cities in the early 1800s were primitive and conducive to the spread of Cholera; New York City was no exception. In addition, the Industrial Revolution was in full swing in Europe and the massive movement away from a completely rural, agriculturally-based society to a more mechanized, waste-creating urban society was just taking hold in the United States.

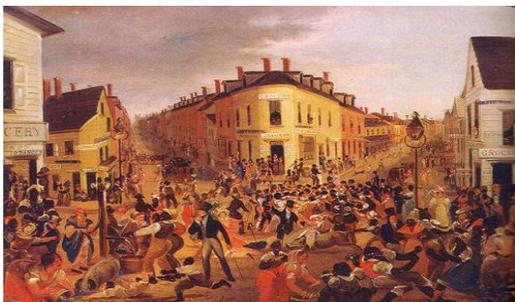
*"Cholera could not have thrived in a city where filth and want did not already exist; nor could it have traveled so widely without an unprecedented development of trade and transportation"*<sup>3</sup>

Many of the New York City cholera victims lived in the Five Points neighborhood, a crowded slum that was occupied mostly by African Americans and Irish immigrants. Located one block off Broadway in New York's Sixth Ward, Five Points was named for its location at the intersection of five different streets. It was known as the foulest, filthiest, poorest and most dangerous location in the city.<sup>4</sup>

Slavery had been abolished in New York as recently as 1827, and many of the poorest freed African Americans settled in neighborhoods such as Five Points.

Irish Protestants had moved to the United States in earlier years, but it wasn't until the mid-1820s that the poorer, Catholic Irish began to leave rural Ireland in droves, attempting to escape poverty and the oppressive tenant farmer system.<sup>5</sup>

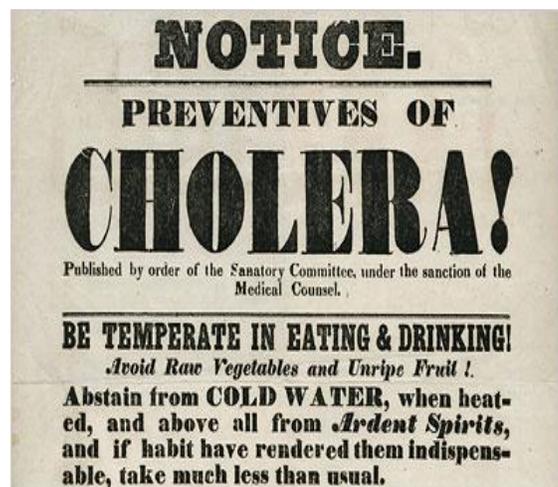
The living conditions they found in New York could hardly have been what they were seeking. In Five Points, the poorest residents lived in damp "cellars, rear houses (built behind row houses), and ramshackle structures in alleys" and courtyards that were equipped with only the most basic means of collecting waste.<sup>7</sup> In a rear building on 39 Orange Street, for example, fifteen people lived in a single room measuring fifteen by fourteen feet.<sup>8</sup>



"Five Points" by George Catlin, 1827  
Image Ownership: Public Domain

Others lived in boarding houses or apartment buildings called tenements or "rookeries" which usually had no indoor plumbing although occasionally a communal sink. Privies or outhouses were usually outdoors, or in basements, and they overflowed frequently due to rain or neglect. Rodents and bugs were so common, the area was described as "pestiferous" by early public health reformer and physician Dr. John Griscom.<sup>9</sup> Putrid waste from tanneries, slaughterhouses and scavenging pigs flowed in the streets. Wandering swine ate garbage as well as excrement and were appreciated as much for their

assistance with sanitation as they were considered a public nuisance. Hogs could also carry cholera



Sign posted in Five Points neighborhood.<sup>6</sup>

in their blood.

In the 1830s, horse and carriage was the only means of travel; horses were also used to haul waste and pushcarts. Everyday up to 500,000 pounds of horse manure was dumped on the streets.<sup>10</sup>

*“Most lived in tiny unventilated apartments, often with whole families-and perhaps a few boarders-occupying the same room, a condition deplored by physicians and moralists alike. The most miserable and degraded lived in unfinished cellars, their walls a mat of slime, sewage, and moisture after every rain. Houses adjoined stables, abattoirs, and soap factories; their front yards were the meeting place of dogs, swine, chickens, and horses.”<sup>11</sup>*

Once cholera hit the city in late June of 1832, it swept through like a relentless fire. Because no one yet understood the cause of the disease, nor how it was transmitted – the presiding medical theory of the day was that miasmas or bad gases carried sicknesses – it spread fast and furiously. Few who contracted the illness survived. Because slum-dwellers were the common targets of such cholera outbreaks, many pointed to immoral behavior as the cause – depravity, drunkenness and dirt invited disease, they believed.

Residents who could afford to leave the city departed in large numbers to country houses, or homes of relatives, often carrying the disease with them. Only the poorest residents remained, and a handful of dutiful doctors and others who felt obliged to stay.

As the epidemic raged on, besieged Mayor Walter Brown ordered the streets to be cleaned, and all cesspools (sewage or waste tanks or pits) to be disinfected with lime. Despite these efforts, people continued to die, as many still had no access to unpolluted water. The New York City Board of Health established five temporary hospitals specifically to treat cholera, although because of an underlying ignorance of basic microbiology and germ theory, the “cures” were possibly more harmful than the illness itself.<sup>12</sup>

When epidemiologists, or disease detectives, try to determine the cause and nature of a disease, they usually begin by studying the victims. Who died, when and where? What and where did they eat, drink and bathe? The first person to fall ill from cholera in New York in 1832 is reported to have been someone known now only as Mr. Fitzgerald. His sad life has been analyzed by historians and disease experts since that fateful summer.

The Fitzgerald family had emigrated from Ireland to Quebec in the fall of 1831, soon traveling south to Albany and eventually on to New York City. Mr. Fitzgerald was a tailor in the dockside neighborhood, selling clothes to sailors. According to historians, the Fitzgerald family’s fortunes took a turn for the worse in late June of 1832.

*“June 26, 1832, was a hot summer Monday in New York, then a flourishing but filthy port city of just under a quarter-million people. The mercury hit 90° under the noonday sun, the barometer was high and steady, a faint southwesterly breeze barely stirred the air. There had been no rain for a week, less than an inch for the month, and none would fall until well into July. Fitzgerald headed off to Brooklyn that day, taking a ferry across the East River. When he returned late in the evening, he became terribly sick.”<sup>13</sup>*

Another historian described the situation this way:

*“Late Monday night, June 26, an Irish immigrant named Fitzgerald came home violently ill. The pain in his stomach grew worse during the night, and in the morning he called a doctor. When the doctor arrived, Fitzgerald was already feeling better, but his two children were sick... (Jeremiah, age 4, and Margaret, age 7). The children died on Wednesday, but not before they were seen by many physicians, all of whom agreed upon a diagnosis of Asiatic cholera. Mrs. Fitzgerald died on Friday . . .”<sup>14</sup>*

Doctors and scientists in New York put together a periodical called the “Cholera Bulletin”, published a few times during the summer of 1832. It remains an important historical document, allowing modern day researchers a glimpse at a horrifying time in New York City. Others took notes too, including Horatio Bartley an apothecary living in New York at the time. Bartley put together a pamphlet of illustrations and descriptions of cholera cases at one of the city’s cholera hospitals on Rivington Street. This drawing of one of the victims, listed only as J.G., was depicted in Bartley’s book.

*“J.G. aged thirty-one, admitted six o’clock, P.M. July 17th, 1832, in the stage of collapse. Was rubbed with camphorated mercurial ointment, until reaction was produced; he was then put under hospital treatment. 22d. Ptyalism [excessive salivation] being induced, was ordered small doses of sulphur, and a wash of the same for the mouth. At six o’clock P.M. diarrhea increasing, was ordered an anodyne enema. He was under medical treatment until 24th, when he died, at three o’clock, P.M.”<sup>15</sup>*



By July 1832 there were 100 deaths a day recorded in New York City. By December the disease slowed and then stopped. During those few terrible months, 3,515 people died. Cholera left New York, until the next epidemic, in 1849. By that time, understanding of disease and its connection to germs was far more sophisticated. Appreciation of the importance of clean water also grew after 1832 as did recognition of the need for effective public health response to societal ills. The Croton Aqueduct transporting water from rural northern New York to the city was constructed between 1837 and 1842. So, perhaps those many deaths during the summer of 1832 were not entirely in vain.

### **TEACHER INFORMATION: (With Extension, Guiding and Assessment Questions)**

In the assessment, students are asked to identify the disease source and what subsequent steps should be. The source should be identified as water from the Paradise Park well which was contaminated by tainted meat from the Orange Street Butcher, as well as by the waste of cholera victims. The Orange Street Butcher may have butchered sick, wandering swine for his meat, and then passed along the cholera germs by means of his shop’s waste and his own. Testing that theory would be challenging in 1832, as once the spread of cholera went beyond the confines of the neighborhood, tracing it to a single source would have been difficult without any modern scientific inquiry methods. Students might suggest that the Paradise Park well be emptied and cleaned and the outdoor toilets moved, and regular waste pick-up instituted. Those answers would be correct. They might also suggest that the Orange Street Butcher shop be closed down, and the meat tested for cholera. The practice of butchering animals – especially sick animals – in proximity to a well and an intense concentration of humans is not good sanitation practice!

In modern day, the next step would be to test and take samples of the water to confirm the existence of cholera virus, and confirm the water’s contamination by animal and human wastes from the neighboring butcher and outdoor toilets.

Students can research more about the cholera virus on the Centers for Disease Control and Prevention’s website: <http://www.cdc.gov/cholera/index.html>.

### **UNIT EXTENSION:**

The cholera epidemic in New York City was distributed unequally amongst its residents. Most victims of the disease lived in the poorest neighborhoods. Many critics of the day considered them deserving of the illness, women and children included. Even the governor of New York proclaimed that “an infinitely wise and just God has seen fit to employ pestilence as one means of scourging the human

race for their sins, and it seems to be an appropriate one for the sins of uncleanness and intemperance. . . .”<sup>16</sup>

John Pintard, merchant, banker, and founder of the New York Historical Society, remarked on July 13, 1832 that the alarm in New York City would be great indeed if the disease were ever to attack the “regular householders.” He thanked God that it remained “*almost exclusively confined to the lower classes of intemperate dissolute & filthy people huddled together like swine in their polluted habitations.*”<sup>17</sup>

The regular householders Pintard was referring to enjoyed very different living conditions from those in the Five Points slum and others like it. **Seabury Tredwell** was a wealthy hardware merchant who worked on Pearl Street at the southern tip of Five Points. He frequented the docks where ships would carry his merchandise. He, his wife Eliza and their seven children lived in the Bond Street area, what was then the fashionable north end of the growing city. The house still remains as a museum today and offers a glimpse into the life of the well-heeled in pre-civil war New York City, and presents a stark contrast with conditions found less than two miles away. (see link: <http://www.nyc-architecture.com/LES/LES017.htm>)

**GUIDING and ASSESSMENT QUESTIONS:** Use these questions as you see fit, in addition to the Student Analysis, to guide group discussion and or extend the

1. What would have made the poor in New York City more susceptible to disease than the wealthy?
2. Compare and contrast their living conditions between neighbors in NYC in 1832.
3. Did they breathe similar air? (What about Mr. Tredwell? Does the miasmas theory [poisonous gas] of cholera transmission hold up in his case?) Drink the same water?
4. In 1832, how would you determine if your theory is correct? How would you test your theory in present times?
5. Using what you know about cholera and how it is transmitted, propose possible solutions to how, in 1832, they could have stopped the spread of the disease in Five Points.

6. **FOR FURTHER ENRICHMENT:** Examine other outbreaks of cholera for parallels between living conditions, health concerns, treatments and relief assistance, etc.

**For example, examine the most recent epidemic in HAITI:**

[http://www.cdc.gov/haiticholera/haiti\\_cholera.htm](http://www.cdc.gov/haiticholera/haiti_cholera.htm);

<http://www.nytimes.com/2012/04/01/world/americas/haitis-cholera-outraced-the-experts-and-tainted-the-un.html?pagewanted=all>

Identify any similarities between the Haitian victims of cholera and those who lived in New York’s Five Points neighborhood in 1832.

7. A significant disparity exists between those who have access to sanitation and those who don’t. In developing countries, although urban dwellers are more likely to have piped water or sanitation facilities than rural residents, the economic divide is universal. Throughout the world, poorer citizens are the least likely to have access to these necessary resources.

According to a UNICEF report: “*An analysis of 20 recent Demographic and Health Surveys showed that the richest quintile is four times more likely to have access to sanitation than the poorest quintile.*”<sup>19</sup>

How does this observation apply to the cholera victims in Haiti and in New York’s Five Points neighborhood?

## FOR FURTHER READING:

- “Fighting Yellow Fever and Cholera.”  
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- Shapin, Steven. *Sick City*, November 6, 2006. The New Yorker.  
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<http://www.jstor.org/discover/10.2307/20852995?uid=3739832&uid=2129&uid=2&uid=70&uid=4&uid=3739256&sid=21100760615771>
- Virtual New York, Produced by the New Media Lab at the Graduate Center, City University of New York, VNY [http://www.virtualny.cuny.edu/cholera/1832/cholera\\_1832\\_set.html](http://www.virtualny.cuny.edu/cholera/1832/cholera_1832_set.html)

## POTABLE POISON: ENDNOTES

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2. World Health Organization: Media Centre, Cholera Fact Sheet #107, August 2011  
<http://www.who.int/mediacentre/factsheets/fs107/en/index.html>
3. Rosenberg, Charles E. “The Cholera Years: The United States in 1832, 1849 and 1866.” Introduction. Chicago 1962, 1987 [www.stanford.edu/dept/HSP/154/May13RosenbergP1to98.pdf](http://www.stanford.edu/dept/HSP/154/May13RosenbergP1to98.pdf)
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[http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/von\\_hoffman\\_w98-2.pdf](http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/von_hoffman_w98-2.pdf)
5. Simkin, John. “Irish Immigration.” <http://www.spartacus.schoolnet.co.uk/USAireland.htm>
6. Notice. Preventives of Cholera! Published by order of the Sanatory Committee, under the sanction of the Medical Counsel (New York, 1849). New York Historical Society, exhibit; *Plague in Gotham! Cholera in 19<sup>th</sup> Century New York*. April – August 2008. <http://www.nyhistory.org/node/241>
7. Hoffman, p. 5
8. Anbinder, Tyler. *Five Points: The 19th-Century New York City Neighborhood That Invented Tap Dance, Stole Elections, and Became the World’s Most Notorious Slum*. New York: Free Press, 2001.  
<http://www.historycooperative.org/journals/ahr/107.2/ah0202000351.html>
9. Griscom, John Hoskins. *The Sanitary Conditions of the Laboring Population of New York*, p. 7. Harper and Brothers, 1845. Harvard College Library.
10. Royte, Elizabeth. “Garbage Land: On the Secret Trail of Trash”
11. Rosenberg, p.18

12. Beardslee, G. William, *The 1832 Cholera Epidemic in New York State, 19<sup>th</sup> Century Responses to Cholerae Vibrio*. 19th Century Cholera Regimens and Therapies, Chapter V.  
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<http://www.nytimes.com/books/first/k/koepfel-gotham.html>
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16. Rosenberg, "God's Justice" [1 New York State, Messages from the Governors, Comprising Executive Communications to the Legislature . . . (Albany, 2909), 111, 395; American for the Country (New York), June 26, 1832.]
17. Rosenberg, p.42
18. Shapin, Steven. *Sick City*, November 6, 2006. The New Yorker.  
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Map Adapted from: <http://www.historycooperative.org/journals/ahr/107.2/ah0202000351.html>  
Original mapmaker Chris Robinson, 1851.