

**JOHN SNOW: BREAKING BARRIERS FOR MODERN EPIDEMIOLOGY**

**GRACE VANCE**

**SENIOR DIVISION**

**INDIVIDUAL EXHIBIT**

**STUDENT-COMPOSED WORDS: 500**

**PROCESS PAPER: 500**

## **PROCESS PAPER**

Considering a future career in Medicine, I knew from the start of my project that something in that field would spark my interest. Since this year's theme is Breaking Barriers, I also wanted to look for something that was impactful, important, and revolutionary. From my searching came the topic of my dreams: a detective story, a scientific breakthrough, and a historical milestone, all rolled into one. My topic this year is John Snow, and his groundbreaking discoveries in connection with the London Cholera outbreak of 1854. I chose an exhibit board for my presentation because I wanted to include many aspects of my research in both a visual and tangible way.

I began my research reading articles introducing me into the field of Epidemiology. I started to look around for biographies, and discovered an insanely helpful collaborative book entitled "Cholera, Chloroform, and the Science of Medicine: a Life of John Snow." Other helpful sources included UCLA and Michigan State's epidemiology department websites. These websites gave me access to many primary source documents written by Snow himself.

One of the changes I had to make during the duration of my project was narrowing down my thesis. John Snow, being the scientific man he was, was extremely qualified in both the fields of anesthesia/vapors and epidemiology, so I had to pick one or the other to focus on. After deciding to narrow down on his epidemiological work, I had to decide which discovery of his was the most impactful to the world. During the research process, I also found it difficult to find good quality or high resolution images for my board, not only because of the niche subject matter, but also because of the camera quality during the 1840's and 1850's.

The construction of my exhibit also came with its own special problems. The 3-D model of the water pump took four prints to make accurate and clear. Deciding how to attach the “map” wood to the black wood also took a lot of brainstorming. Gluing the pieces together couldn’t work, because then I wouldn’t have access to my iPad or my battery packs without taking the board apart. Eventually, I settled on using Velcro. Another issue I ran into was my iPad box being too small. Only after gluing all of my wires down to the back of my board did I realize that the box was way too small. With the wires in the way, I had to remove the box, and then recut the wood pieces a few more times before I had enough room to slide in my iPad.

John Snow’s research certainly broke barriers. He changed how both society and science viewed illnesses by disproving Miasma Theory. His investigative work also paved the way for The Germ Theory of Disease, which emerged only a few years after his death. Lastly, his studies revolutionized how we view public health and hygiene, which is incredibly important in years like 2020, considering we are facing a worldwide pandemic.

# Annotated Bibliography

## Primary Sources

### *Book*

Snow, John. *On the Mode of Communication of Cholera*. London: John Churchill, 1855.

In this book, Dr. John Snow outlines a brief history of Cholera, followed by several case-by-case analyses of Cholera traveling through the medium of polluted water. In this work, he goes into great depth regarding two of his studies- the Broad Street pump outbreak of 1854, and the “Grand Experiment,” also of 1854. This book was super helpful for me during my research, because it serves as a first-hand account of the outbreaks from John Snow himself, guaranteeing accurate information. As it was probably my most valuable primary source, and I included a picture of the title page on my board.

### *Images*

*A Court for King Cholera*. 1852. Illustration. Keystage History Online Ltd.

<https://www.keystagehistory.co.uk/free-samples/teaching-industrial-britain-at-ks3/>

This political cartoon, originally published in the weekly British magazine *Punch*, presents a Cholera-infested London scene. I chose to use this image in my exhibit because I think it’s important to show how influential these outbreaks really were. Through this illustration, we can see that the cholera epidemic influenced politics, art, and the press enough for *Punch* to create a satirical depiction of the events that occurred.

*Broad Street*. 1888. Photograph. The John Snow Archive and Research Companion.

[http://johnsnow.matrix.msu.edu/images/online\\_companion/chapter\\_images/fig11-1.jpg](http://johnsnow.matrix.msu.edu/images/online_companion/chapter_images/fig11-1.jpg).

This photograph was taken of a building on Broad Street in the late 1880’s. I wanted to include this image in my project to bring the Victorian London setting to my viewers’ eyes. Seeing the location of the outbreaks, I find, can remind us that it was a real event, as well as give a little context for what buildings used to look like in the time period.

*Blue Stage of the Spasmodic Cholera*. Illustration. The John Snow Archive and Research Companion.

[http://johnsnow.matrix.msu.edu/images/online\\_companion/chapter\\_images/fig7-1.jpg](http://johnsnow.matrix.msu.edu/images/online_companion/chapter_images/fig7-1.jpg).

This illustration depicts a very ill girl, laying down in a bed. The girl in the picture later died of her Cholera illness in November of 1813. I chose this picture in particular to put on my exhibit board because it shows the conditions that some Cholera patients were kept in, as well as to emphasize to my audience that anyone, men, women, and children alike could fall victim to the horrors of this disease.

*Father Thames Introducing his Offspring to the Fair City of London.* July 3, 1858. Illustration. British Library.

<https://www.bl.uk/collection-items/father-thames-introducing-his-offspring-to-the-fair-city-of-london-from-punch>.

In this illustration, the city of London is personified, as well as the Thames river and his “children”: Diphtheria, Scrofula, and Cholera. I felt drawn towards this image in particular because I felt it captured the common perspective of the Londoners in regards to the rampant water-borne diseases of the mid-19th century. The people believed that the diseases plaguing their town were ugly, horrid, creatures that spawned in the river Thames, and this picture symbolizes that.

*Henry Whitehead.* 1884. Photograph. UCLA Department of Epidemiology.

<http://www.ph.ucla.edu/epi/snow/whiteheadportrait1884.html>.

This is a portrait of Reverend Henry Whitehead, an important assistant and contributor to Snow’s research of the Soho, London district Cholera outbreak of 1854. I used this image in my presentation because I think it’s important to acknowledge that although John Snow gets the credit for his work, there was no way he could have collected all his data and crucial observations without the help of Reverend Whitehead.

*John Snow.* 1857. Photograph. UCLA Department of Epidemiology.

<http://www.ph.ucla.edu/epi/snow/snowimage.html>.

This is a portrait of Dr. John Snow taken by an unknown photographer in 1857. I decided to use this image on my board because I think it's helpful for the viewers of my exhibit to match the face with the analysis and research of the person.

November 1, 1831. Poster. Wellcome Collection.

<https://iiif.wellcomecollection.org/image/L0000611.jpg/full/full/0/default.jpg>.

I felt drawn to use this image in my project because it shows the extent of medical knowledge people had in the Victorian Era. During the 1830s, there was not nearly as much information about Cholera or pathogens, so they didn't really have an effective way of treating them. As you can see in this poster, even government appointed councils couldn't recommend much other than the patient be immediately put to bed, restored of their warmth, and given hot drinks with essential oils.

Seymour, Robert. *Cholera "Tramples the victors & the vanquished both."*. October 1, 1831. Illustration. U.S. National Library of Medicine. <https://collections.nlm.nih.gov/catalog/nlm:nlmuid-101393375-img>.

In this illustration, Cholera is depicted as an ominous and vaporous, yet skeletal apparition, crushing the soldiers on the battlefield. I used this image to supplement my section on Miasma Theory because Cholera is symbolized as a killer within the air.

Seymour, Robert. *A London Board of Health Hunting After Cases Like Cholera*. March 1, 1832. Illustration. U.S. National Library of Medicine. <https://collections.nlm.nih.gov/catalog/nlm:nlmuid-101393365-img>.

This illustration depicts members of a London health board "hunting" for the source of a disease. It was made satirically, and it goes to show that even though miasma theory was commonly accepted, they couldn't do much with the technology at the time to control or locate the disease. I used this image on my board because I found it personally humorous, and I thought it helps put the idea of miasma theory in an easy to understand way for those who haven't heard of it before.

Snow, John. Map. London: John Snow, 1854. Michigan State University College of Social Science. [http://matrix.msu.edu/~johnsnow/images/online\\_companion/chapter\\_images/fig12-5.jpg](http://matrix.msu.edu/~johnsnow/images/online_companion/chapter_images/fig12-5.jpg).

This is a digital copy of the original map by John Snow depicting clusters of Cholera cases in the Soho, London outbreak of 1854. The disease clusters are marked by black, horizontally stacked rectangles. This image is quite frankly one of the most important primary sources I found, because it shows exactly how John Snow went about drawing his conclusions. I liked this image so much, in fact, I decided to recreate it in wood for the middle section of my exhibit.

*Vibrio Cholerae*. Transmission Electron Micrograph. The University of Texas at Austin College of Natural Sciences. <http://www.cns.utexas.edu/news/50-year-cholera-mystery-solved>.

This image is a Transmission Electron Micrograph of a group of Cholera bacteria, taken at the University of Texas at Austin. This picture was crucial for me in the making of my Cholera models, giving me a visual reference for when I was cutting out the organisms. It also helped me visualize the disease as a living thing.

*William Farr*. [1850?]. Photograph. The John Snow Archive and Research Companion.  
[http://johnsnow.matrix.msu.edu/images/online\\_companion/chapter\\_images/fig7-5.jpg](http://johnsnow.matrix.msu.edu/images/online_companion/chapter_images/fig7-5.jpg).

This image is a portrait of William Farr, one of Snow's most prominent opponents, taken by an unknown photographer around the year 1850. Although Farr is not featured on my exhibit board for the National Competition, his involvement in Snow's career was notable.

### ***Interactive Map***

“COVID-19 Dashboard.” Map. *Johns Hopkins University & Medicine*. Baltimore, Maryland: Johns Hopkins University, 2020.

This map, published by Johns Hopkins, charts all real time cases of confirmed Coronavirus around the world. I wanted to include a screenshot of this technology on my exhibit because of how reminiscent of Snow's own mapping it is. Without Snow's influence, we might not have been able to have epidemiological technology like this so readily available today.

### ***Newspaper***

Yorkville Enquirer, June 28, 1899.

<https://www.loc.gov/resource/sn84026925/1899-06-28/ed-1/?sp=2&q=Germ Theory of Disease&r=-0.864,0.646,2.728,1.09,0>.

This South Carolina Newspaper, the Yorkville Enquirer, has a section in it commenting on the Germ Theory of Disease. This Library of Congress source was very helpful to read through- for one, you can certainly see how even decades after the Germ Theory of Disease became popularized by Louis Pasteur, most people still didn't quite grasp the concept. I felt drawn to this quote in particular: “There is something in the Germ Theory, of course; but whatever there is, it is rather too deep for the comprehension of the ordinary mind. The ordinary mind can grasp the surface of the subject; but even that gets lost in a maze pretty soon after it attempts to descend to the depths.” Through this, you

can see the public's hesitation towards scientific change, even outside of Europe. How America shifted from this attitude to teaching the Germ Theory of Disease to middle schoolers truly amazes me.

## ***Report***

Cholera Inquiry Committee, *Report on the Cholera Outbreak in the Parish of St. James, Westminster, during the Autumn of 1854*. London: John Churchill, 1855.

The Cholera Inquiry committee was composed of Rev. Whitehead and John Snow, as well as several other doctors and church members. Snow and his peers' findings on the London Cholera outbreaks were compiled and published in this report, then presented to the vestry of St. James', Westminster. I think this was a really interesting and helpful document for me to read through, because it's a very lengthy, detailed primary source, describing the investigation of the Cholera outbreak Snow was appointed to research.

## ***Testimony***

"Snow's Testimony." UCLA Department of Epidemiology. Accessed December 23, 2019.  
[http://www.ph.ucla.edu/epi/snow/snows\\_testimony.html](http://www.ph.ucla.edu/epi/snow/snows_testimony.html)

This transcript, uploaded verbatim by UCLA's Department of Epidemiology provided me with the dialogue from John Snow's testimony to a parliamentary committee, discussing his notions and beliefs on the transmission of Cholera. I quoted this testimony on my exhibit board, because Snow directly spoke his mind, without beating around the bush to appeal more rationally to the British government. It is still worthy to note though, he had a good relationship with the English sovereignty (I touch on this more in my annotation under the webpage "Anesthesia and Queen Victoria").

## **Secondary Sources**

### ***Academic Journal Articles***

Kannadan, Ajesh. "History of the Miasma Theory of Disease." *ESSAI* 15, no.18 (2018).  
<https://dc.cod.edu/cgi/viewcontent.cgi?article=1657&context=essai>.

This journal article was useful to me in understanding just how old Miasma Theory is, as



well as its general origins. It was interesting to read how Hippocrates believed “bad air” could cause pestilence, considering how much we commend his medical work in modern times.

Lilienfeld, David E. “Celebration: William Farr (1807-1883)— an appreciation on the 200th anniversary of his birth.” *International Journal of Epidemiology* 36, no.5 (October 2007): 985-987. <https://academic.oup.com/ije/article/36/5/985/775018>

This journal article helped me in my project by providing a small biography and summary of William Farr’s life, as well as his contributions to the field of Epidemiology/public health. William Farr was an important factor to consider when piecing together what story I wanted to tell in my exhibit, because he was one of the most outspoken opponents of John Snow’s work- before he eventually ended up siding with Snow’s theories over the popular “Miasma Theory” of disease transmission. In the end, I chose to leave Farr out of my exhibit for the national competition to include other aspects of Snow’s story I thought were more important (such as more modern impacts).

## **Books**

Fitzharris, Lindsey. *The Butchering Art: Joseph Lister’s Quest to Transform the Grisly World of Victorian Medicine*. New York: Scientific American / Farrar, Stratus and Giroux, 2017.

I read this book to get a general understanding of Victorian life. This book was a fantastic read, and while it focused more on the surgical and invasive side of medicine, I felt like it was necessary to include it here in my bibliography. It described the fallacies of many mid-19th century theories, including Miasma theory and the action of blood-letting.

Hempel, Sandra. *The Medical Detective: John Snow, Cholera and the Mystery of the Broad Street Pump*. London: Granta Books, 2007.

This book is a secondary source telling the story of “The Grand Experiment.” This book really highlighted the scientific skill of Dr. Snow, and showed his struggle to get others to believe him, even when the clear, definitive answer was right in front of them.

Johnson, Steven. *The Ghost Map*. New York: Riverhead Books, 2006.

This New York Times Notable Book tells the story of the Broad Street outbreak in a new light. I appreciated this read because it described histories of the spread of disease,

provided me with general Victorian history as well as explained how John Snow's thinking was really a pinnacle example of scientific inquiry, or scientific theory.

Mitchell, Sally. *Daily Life in Victorian England*. Westport: Greenwood Press, 2009.

This book was helpful to my research because it gave a detailed run-down of day-to-day life in Victorian England. It described how different groups of people dealt with hygiene, food needs, water needs, and disease- among many other things.

Shah, Sonia. *Pandemic: Tracking Contagions, from Cholera to Ebola and Beyond*. New York: Sarah Crichton Books, 2016.

I read through this book to give myself a better grasp of epidemics and pandemics. It helped me establish a brief history of many diseases, not just cholera, which gave me a more conceptual and well-rounded knowledge of illnesses.

### ***Images***

*Broad Street Cholera Pump*. Photograph. Atlas Obscura.

<https://www.atlasobscura.com/places/broad-street-cholera-pump>.

I used this image on my board because I found this memorial to John Snow and his work very beautiful. There's a plaque below the pump model not pictured that summarizes Snow's work, but I wasn't able to find an image with as clear a resolution including the plaque as the one I used on my exhibit.

Photograph. Passport Health.

<https://www.passporthealthusa.com/2019/04/dr-john-snow-and-the-origin-of-epidemiology/>.

This website provided a high resolution image of the title page of one of Snow's works: his book, "On the Mode of Communication of Cholera."

### ***Interviews***

"John Snow's Contribution to Modern Epidemiology." Video file, 11:03. YouTube. Posted by HarvardX, October 16, 2017.

<https://www.youtube.com/watch?v=MbQ4-gKmp6E&t=191s>.

This video was pulled from HarvardX's free online course about John Snow. In this video, Dr. Rosalind Stanwell-Smith, a senior lecturer at the London School of Hygiene and Tropical Medicine, as well as Harvard professor Don Goldman are interviewed about Snow and his scientific contributions to modern epidemiology. This interview was very beneficial for me to have as a resource, because it gave me a professional, modern take on my topic. I presented a small section of this interview within my exhibit on an iPad, which was secured by a wood box I created to fasten to my central map engraving.

Keller, Kara. Interview by Grace Vance. Email. Westerville, March 11, 2020.

Ms. Keller is the Central Region Coordinator and an Infectious Disease Epidemiologist at Franklin County Public Health in Ohio. I contacted her in early March via email, shortly after moving on from National History Day regionals in February. Ms. Keller was able to answer a few questions that I had about epidemiology- for the most part, I asked her about her job working in public health, what modern epidemiologists do today, how her and her coworkers go about tracing outbreaks of illnesses, and if they used mapping techniques similar to how John Snow did in the 19th century. One of the notable things I learned from Ms. Keller that really helped me connect John Snow's time to modern time is how varied a "normal" day in her world looks like. Every day as a modern epidemiologist comes with its own challenges and problems to solve. From local communities such as schools, to long term healthcare facilities, her life is changing constantly. Because of her words, not only was I able to draw connections to Dr. Snow's chaotic research life, but I was also able to gain so much respect for those who pursue public health science as a career. Ms. Keller also generously explained to me how they use a mapping software known as a "GIS," or a Geographic Information System. Basically, programs such as these are able to transfer the data that epidemiologists collect onto virtual maps that they can observe. I thought this was fascinating, because it goes to show that the work John Snow conducted over a century ago is almost identical to the methodology that we use today.

Zabala, Amanda. Interview by Grace Vance. Email. Westerville, March 18, 2020.

Ms. Zabala, like Ms. Keller, also works with disease and public health. She is part of the team of epidemiologists at Columbus Public Health in Ohio. I asked her similar questions to the ones I had asked Ms. Keller, so that I could compare how different regions in Ohio handled disease control. I also asked a few more questions that I didn't think of at the time of my first exchange with an epidemiologist (Ms. Keller). Some questions that I targeted at Ms. Zabala specifically include how she believes healthcare and disease research has improved since the Victorian Era, and the different ways she sees illnesses

spread in Ohio. Upon prompting, she mentioned several specific outbreaks, such as the Franklin County Campylobacteriosis spread or the Influenza season, both of 2018. I was extremely lucky to contact these two professionals, considering how quickly the COVID-19 pandemic became a major issue in Central Ohio in less than a few weeks after I spoke with them. I greatly appreciated their time, effort, and kindness in getting back to me in more than a reasonable time frame, as their words have become essential to the greater understanding of my National History Day project this year.

### ***Video***

“The Real Story of John Snow.” Video file, 5:39. YouTube. Posted by SciShow, October 10, 2019. [https://www.youtube.com/watch?v=\\_Uwwhudc-CQ](https://www.youtube.com/watch?v=_Uwwhudc-CQ).

This informational video, published by SciShow and hosted by Hank Green, presents a quick introductory lesson on John Snow and his cholera work. I used a section of this video in my interactive/multimedia portion of my exhibit because it highlights the fact that Snow’s work wasn’t immediately accepted by the world, but because of his innovative mapping techniques and research, we are able to better track viruses and save lives.

### ***Websites***

“Anesthesia and Queen Victoria.” UCLA Department of Epidemiology. Accessed January 1, 2020. <https://www.ph.ucla.edu/epi/snow/victoria.html>.

I found this source to be important in my research to explain why John Snow’s work got as much recognition and credit as it did. Snow was as much an expert in anesthesia and medical vapors as he was of cholera outbreaks, and because of this was entrusted in administering anesthetic to Queen Victoria during her eighth labor in 1853. This gave him trust and resources from the upper class, making it easier to face public eyes on his work, and convince them of his conclusions.

“The Development of Soho.” The History of London. The History of London. Accessed May 21, 2020. <http://www.thehistoryoflondon.co.uk/the-development-of-soho/2/>.

This source helped me understand the history of Soho specifically during Snow’s time. The History of London website discusses Soho’s origins, starting with the late 1600s, and then talks about how Soho developed through the mid-1800s.

“Huguenot and French London.” The Proceedings of the Old Bailey - London's Central Criminal Court, 1674 to 1913. Old Bailey Proceedings Online. Accessed May 12, 2020.  
<https://www.oldbaileyonline.org/static/Huguenot.jsp>.

This website, dedicated to the proceedings of one of London’s former criminal courts, actually featured substantial information about Soho’s history. Because not much is recorded about Soho after the French Huguenots and Bourgeoisies left (in the 1700s), this website was one of the only sources I could justify relying upon to understand Soho’s historical relevance.

“What is Epidemiology?.” Boston University School of Public Health. Last modified October 18, 2017. Accessed December 22, 2019.  
[http://sphweb.bumc.bu.edu/otlt/mph-modules/ep/ep713\\_history/EP713\\_History9.html](http://sphweb.bumc.bu.edu/otlt/mph-modules/ep/ep713_history/EP713_History9.html)

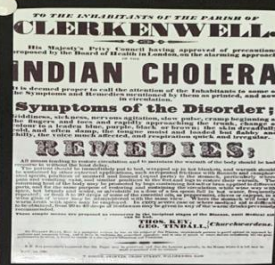
This website was helpful to my research by broadly introducing me into the field of Epidemiology. Specifically, it taught me the definition of Epidemiology, as well as the main “assumptions” that the science is based upon.



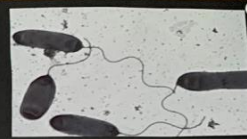
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## OVERVIEW

IN THE MID-19<sup>TH</sup> CENTURY, THE DISTRICT OF SOHO WAS A HAVEN FOR THE MIDDLE CLASS. THE NEIGHBORHOOD HAD A UNIQUE BLEND OF BOTH PROFITABLE COMMERCIAL AND RESIDENTIAL SPACES THANKS TO THE SUCCESS OF THE INDUSTRIAL REVOLUTION. UNFORTUNATELY, THIS SHORT-LIVED PROSPERITY ENDED WHEN SOHO WAS UNDERTAKEN BY A HORRIBLE BOUT OF CHOLERA.

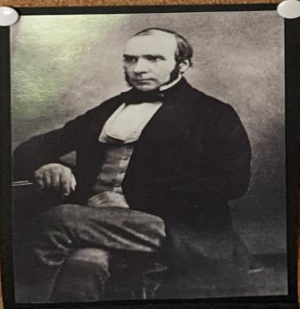


INFORMATIONAL POSTER,  
WELLCOME COLLECTION,  
NOVEMBER 1, 1831



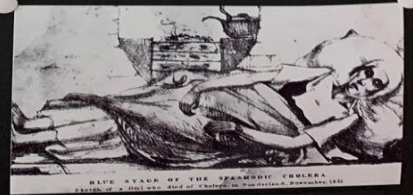
VIBRIO CHOLERAЕ, THE UNIVERSITY OF  
TEXAS AT AUSTIN COLLEGE OF  
NATURAL SCIENCES

## THE MAN



JOHN SNOW, 1857, UCLA DEPARTMENT  
OF EPIDEMIOLOGY

CHOLERA IS A DEVASTATING BACTERIA THAT RAPIDLY DEHYDRATES THE HUMAN BODY CAUSING DEATH WITHIN DAYS. DURING THE 1800S, THERE WERE FOUR MAJOR CHOLERA EPIDEMICS IN LONDON. MANY PEOPLE ATTRIBUTED THEM TO MIASMA THEORY, WHICH THEORIZED ILLNESSES WERE SPREAD THROUGH "BAD AIR," OR AREAS THAT SMELLED ESPECIALLY PUNGENT.



BLUE STAGE OF THE SPASMODIC CHOLERA,  
THE JOHN SNOW ARCHIVE AND RESEARCH  
COMPANION



BROAD STREET, 1888, THE JOHN SNOW  
ARCHIVE AND RESEARCH COMPANION

### Source Credit Text:

Informational Poster, Wellcome Collection, November 1, 1831

*Vibrio Cholerae*, The University of Texas at Austin College of Natural Sciences

John Snow, 1857, the UCLA Department of Epidemiology

*Blue Stage of the Spasmodic Choler*, The John Snow Archive and Research Companion

Broad Street, 1888, The John Snow Archive and Research Companion

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## OVERVIEW


IN THE MID-19TH CENTURY, THE DISTRICT OF SOHO WAS A HAVEN FOR THE MIDDLE CLASS. THE NEIGHBORHOOD HAD A UNIQUE BLEND OF BOTH PROFITABLE COMMERCIAL AND RESIDENTIAL SPACES THANKS TO THE SUCCESS OF THE INDUSTRIAL REVOLUTION. UNFORTUNATELY, THIS SHORT-LIVED PROSPERITY ENDED WHEN SOHO WAS UNDERTAKEN BY A HORRIBLE BOUT OF CHOLERA.

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**THE MAN**




JOHN SNOW, 1857, UCLA DEPARTMENT OF EPIDEMIOLOGY

CHOLERA IS A DEVASTATING BACTERIA THAT RAPIDLY DEHYDRATES THE HUMAN BODY CAUSING DEATH WITHIN DAYS. DURING THE 1800s, THERE WERE FOUR MAJOR CHOLERA EPIDEMICS IN LONDON. MANY PEOPLE ATTRIBUTED THEM TO MIASMA THEORY, WHICH THEORIZED ILLNESSES WERE SPREAD THROUGH "BAD AIR," OR AREAS THAT SMELLED ESPECIALLY PUNGENT.



BLUE STAGE OF THE SPASMODIC CHOLERA. (SOURCE: A HISTORY OF THE CHOLERA EPIDEMIC, 1817-18)

BLUE STAGE OF THE SPASMODIC CHOLERA, THE JOHN SNOW ARCHIVE AND RESEARCH COMPANION



BROAD STREET, 1888, THE JOHN SNOW ARCHIVE AND RESEARCH COMPANION

JOHN SNOW WAS BORN MARCH 15, 1813 IN THE CITY OF YORK, ENGLAND. AFTER EARNING HIS DOCTORATE DEGREE FROM THE UNIVERSITY OF LONDON, SNOW FOUND AN INTEREST IN THE CHOLERA OUTBREAKS PLAGUING EUROPE.

WHEN CHOLERA STRUCK SOHO, SNOW HAPPENED TO LIVE MERE FIVE MINUTES WALK FROM THE VIRUS' EPICENTER. DETERMINED TO DISCOVER ITS ORIGINS, SNOW BEGAN TO INVESTIGATE THE DISEASE.

**THESIS**

JOHN SNOW, THE MAN NOTED AS THE FOUNDER OF EPIDEMIOLOGY, BROKE SCIENTIFIC BARRIERS AND POPULAR BELIEF SURROUNDING THE ORIGINS OF DISEASE, CONTRIBUTING TO OUR MODERN KNOWLEDGE OF MEDICINE THROUGH HIS RESEARCH DURING THE 1854 CHOLERA OUTBREAK IN SOHO, LONDON.

**THE REVELATION**

"I HAVE SATISFIED MYSELF COMPLETELY, THAT THE CHIEF MODE OF PROPAGATION OF CHOLERA IN THE SOUTH DISTRICT OF LONDON, THROUGHOUT THE LATE OUTBREAK, WAS BY THE WATER OF THE SOUTHWARK AND VAUXHALL WATER COMPANY CONTAINING THE SEWAGE OF LONDON."

JOHN SNOW, TESTIMONY, MARCH 5, 1853

## Source Credit Text

John Snow, 1857, the UCLA Department of Epidemiology

*Blue Stage of the Spasmodic Cholera*, The John Snow Archive and Research Companion

Broad Street, 1888, The John Snow Archive and Research Companion

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## THE MAN

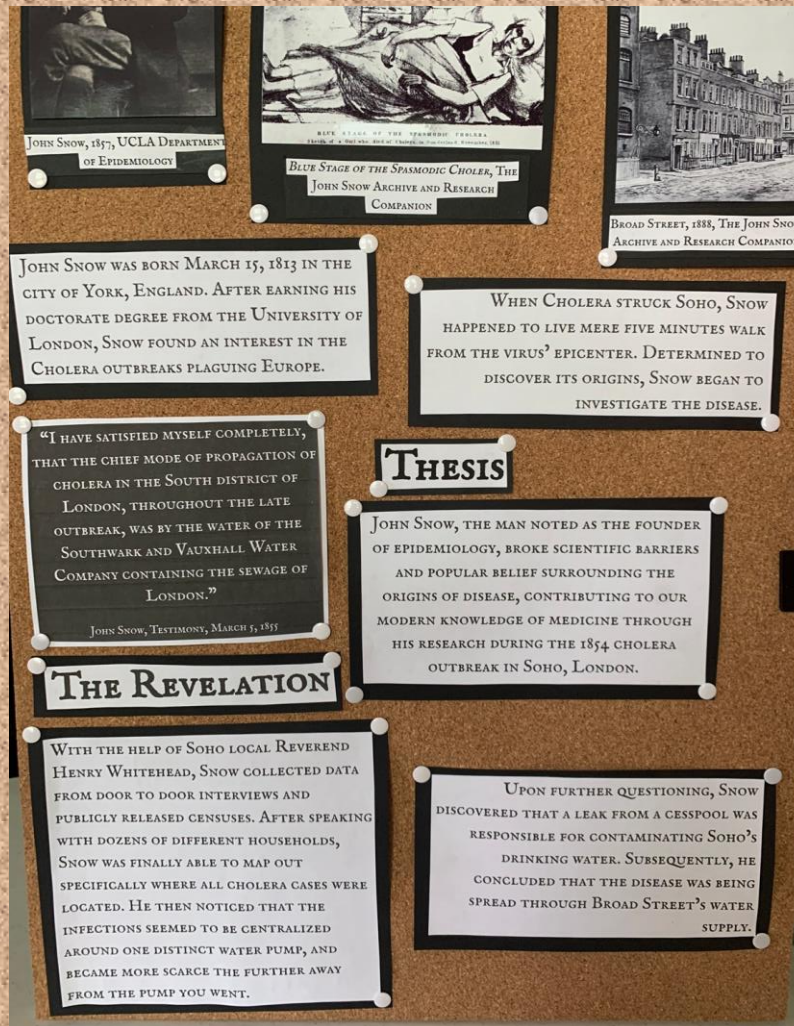
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JOHN SNOW, THE MAN NOTED AS THE FOUNDER OF EPIDEMIOLOGY, BROKE SCIENTIFIC BARRIERS AND POPULAR BELIEF SURROUNDING THE ORIGINS OF DISEASE, CONTRIBUTING TO OUR MODERN KNOWLEDGE OF MEDICINE THROUGH HIS RESEARCH DURING THE 1854 CHOLERA OUTBREAK IN SOHO, LONDON.

# LEFT PANEL BOTTOM PHOTO



## Source Credit Text

John Snow, 1857, the UCLA Department of Epidemiology  
*Blue Stage of the Spasmodic Choler*, The John Snow Archive and Research Companion  
Broad Street, 1888, The John Snow Archive and Research Companion  
John Snow, Testimony, March 5, 1855

# LEFT PANEL BOTTOM TEXT

## THE REVELATION

WITH THE HELP OF SOHO LOCAL REVEREND HENRY WHITEHEAD, SNOW COLLECTED DATA FROM DOOR TO DOOR INTERVIEWS AND PUBLICLY RELEASED CENSUSES. AFTER SPEAKING WITH SOHO'S HOUSEHOLDS, SNOW WAS ABLE TO MAP OUT SPECIFICALLY WHERE ALL CHOLERA CASES WERE LOCATED. HE THEN NOTICED THAT THE INFECTIONS SEEMED TO BE CENTRALIZED AROUND ONE DISTINCT WATER PUMP, AND BECAME MORE SCARCE THE FURTHER AWAY FROM THE PUMP YOU WENT.

UPON FURTHER QUESTIONING, SNOW DISCOVERED THAT A LEAK FROM A CESSPOOL WAS RESPONSIBLE FOR CONTAMINATING SOHO'S DRINKING WATER. SUBSEQUENTLY, HE CONCLUDED THAT THE DISEASE WAS BEING SPREAD THROUGH BROAD STREET'S WATER SUPPLY.

“I HAVE SATISFIED MYSELF COMPLETELY, THAT THE CHIEF MODE OF PROPAGATION OF CHOLERA IN THE SOUTH DISTRICT OF LONDON, THROUGHOUT THE LATE OUTBREAK, WAS BY THE WATER OF THE SOUTHWARK AND VAUXHALL WATER COMPANY CONTAINING THE SEWAGE OF LONDON.”

-JOHN SNOW, TESTIMONY, MARCH 5, 1855

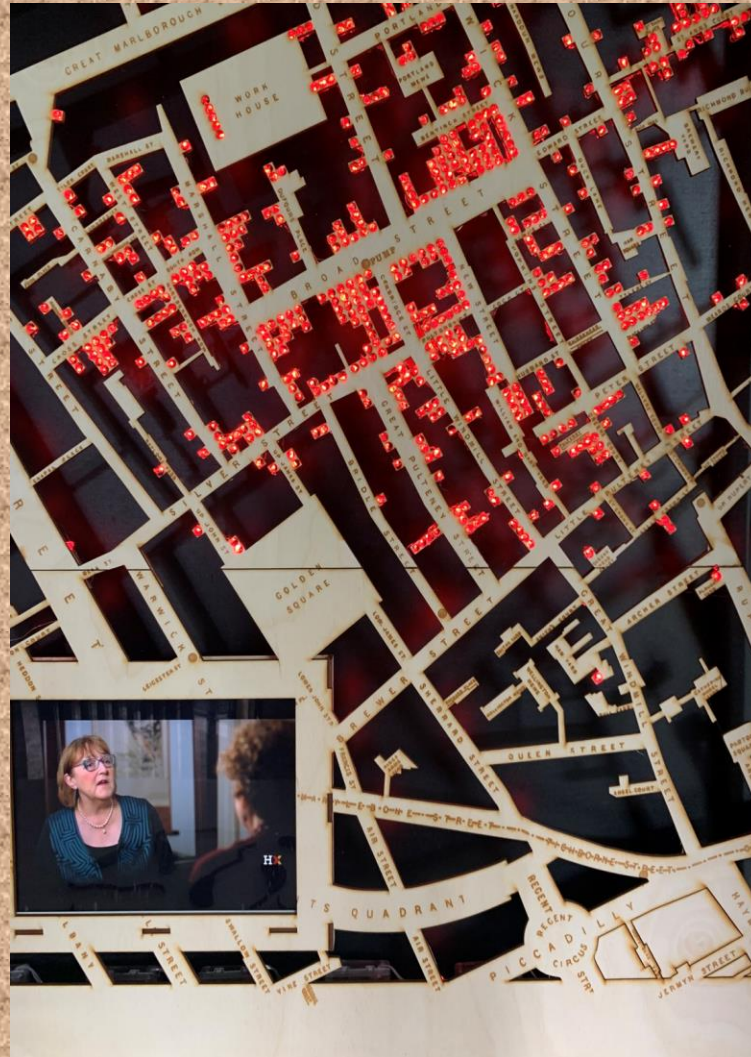


# CENTER PANEL TOP TEXT

JOHN SNOW: BREAKING BARRIERS FOR MODERN EPIDEMIOLOGY



# CENTER PANEL BOTTOM PHOTO

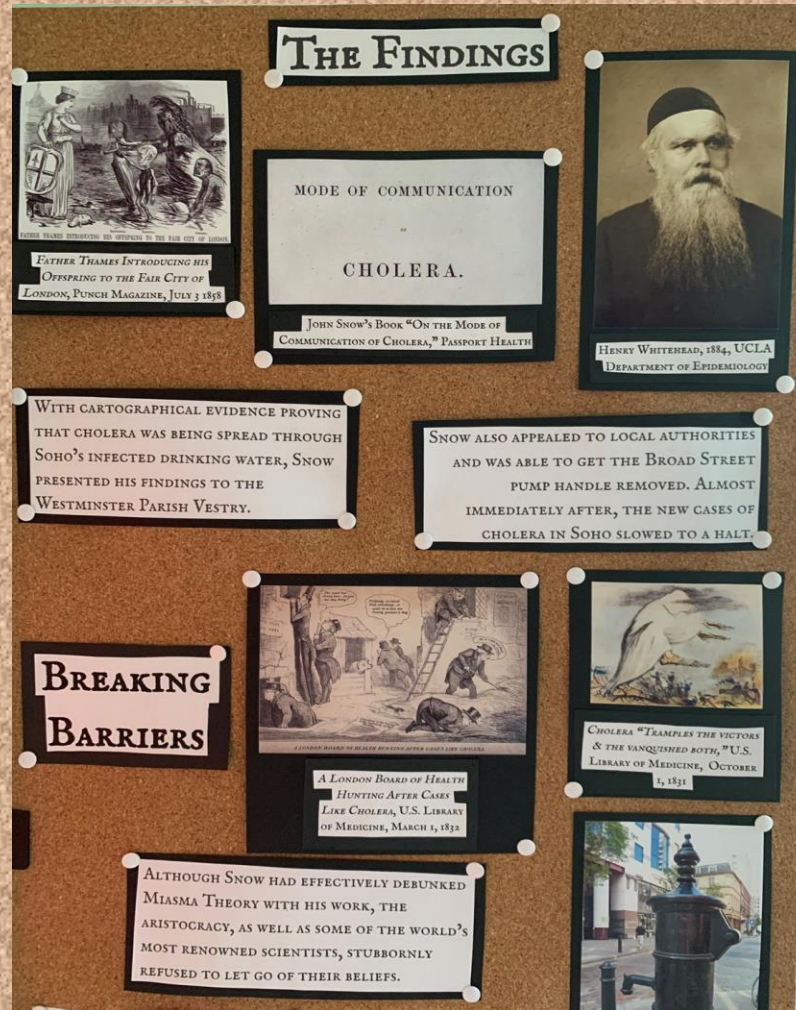


**Source Credit Text:**

John Snow's Soho Map, 1854. Michigan State University College of Social Science.



# RIGHT PANEL TOP PHOTO



## Source Credit Text:

*Father Thames Introducing His Offspring to the Fair City of London, Punch Magazine, July 3, 1858*

*John Snow's Book "On the Mode of Communication of Cholera," Passport Health*

*Henry Whitehead, 1884, UCLA Department of Epidemiology*

*A London Board of Health Hunting After Cases Like Cholera, U.S. Library of Medicine, March 1, 1832*

*Cholera "Tramples the Victors & The Vanquished Both," U.S. Library of Medicine, October 1, 1831*

# RIGHT PANEL TOP TEXT

## THE FINDINGS

WITH CARTOGRAPHICAL EVIDENCE PROVING THAT CHOLERA WAS BEING SPREAD THROUGH SOHO'S INFECTED DRINKING WATER, SNOW PRESENTED HIS FINDINGS TO THE WESTMINSTER PARISH VESTRY.

SNOW ALSO APPEALED TO LOCAL AUTHORITIES AND SUCESSFULLY GOT THE BROAD STREET PUMP HANDLE REMOVED. ALMOST IMMEDIATELY AFTER, THE NEW CASES OF CHOLERA IN SOHO SLOWED TO A HALT.

## BREAKING BARRIERS


ALTHOUGH SNOW HAD EFFECTIVELY DEBUNKED MIASMA THEORY WITH HIS WORK, THE ARISTOCRACY, AS WELL AS SOME OF ENGLAND'S MOST RENOWNED SCIENTISTS REFUSED TO LET GO OF THEIR BELIEFS.

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**BREAKING  
BARRIERS**




A LONDON BOARD OF HEALTH  
HUNTING AFTER CASES  
LIKE CHOLERA, U.S. LIBRARY  
OF MEDICINE, MARCH 1, 1832



CHOLERA "TRAMPLES THE VICTORS  
& THE VANQUISHED BOTH," U.S.  
LIBRARY OF MEDICINE, OCTOBER  
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BROAD STREET WATER PUMP  
MEMORIAL, ATLAS OBSCURA

"...CHOLERA MATTER OR CHOLERINE,  
WHERE IT IS MOST FATAL, IS LARGELY  
DIFFUSED THROUGH WATER, AS WELL AS  
THROUGH OTHER CHANNELS..."

WILLIAM FARR, REGISTRAR-GENERAL'S  
SEVENTEENTH ANNUAL REPORT ON  
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SNOW WAS ABLE TO PINPOINT HOW CHOLERA  
WAS SPREADING, BUT HIS OPPOSERS HAD TO  
KNOW WHY. SNOW'S WORK WASN'T TRULY  
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19<sup>TH</sup> CENTURY, WHEN IT BECAME UNDERSTOOD  
THAT DISEASES WERE CAUSED BY  
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THIS IS SIGNIFICANT TO OUR KNOWLEDGE OF  
PATHOGENS AND THEIR ORIGINS, AS  
UNDERSTANDING HOW TO TRACK DISEASES CAN  
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*A London Board of Health Hunting After Cases Like Cholera*, U.S. Library of Medicine, March 1, 1832  
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JOHN SNOW BROKE BARRIERS IN SCIENCE AND SOCIAL PERCEPTION BY DISPROVING THE COMMONLY HELD MIASMA THEORY, AND AUTHENTICATING THAT CHOLERA CAN BE SPREAD BY WATER.

“...CHOLERA MATTER OR CHOLERINE, WHERE IT IS MOST FATAL, IS LARGELY DIFFUSED THROUGH WATER, AS WELL AS THROUGH OTHER CHANNELS...”

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**BARRIERS**

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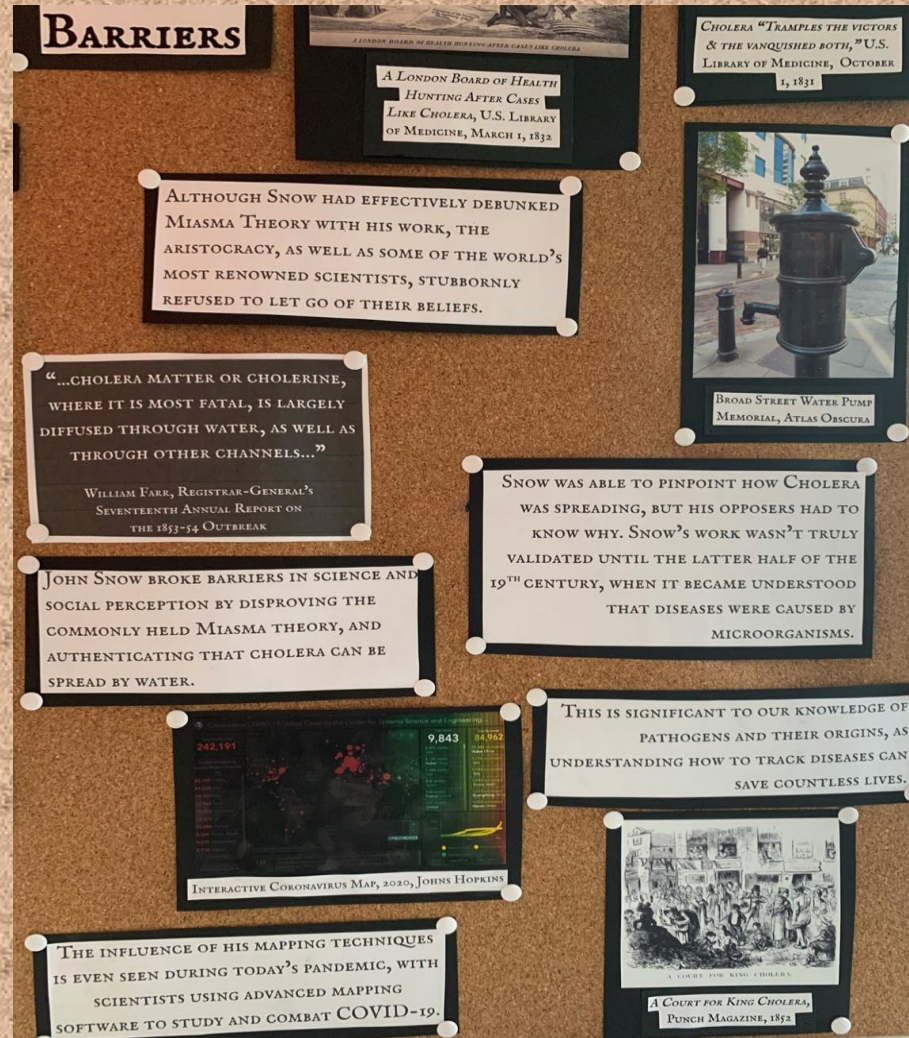
THE INFLUENCE OF HIS MAPPING TECHNIQUES IS EVEN SEEN DURING TODAY'S PANDEMIC, WITH SCIENTISTS USING ADVANCED MAPPING SOFTWARE TO STUDY AND COMBAT COVID-19.

CHOLERA “TRAMPLES THE VICTORS & THE VANQUISHED BOTH,” U.S. LIBRARY OF MEDICINE, OCTOBER 1, 1831

BROAD STREET WATER PUMP MEMORIAL, ATLAS OBSCURA

INTERACTIVE CORONAVIRUS MAP, 2020, JOHNS HOPKINS

A COURT FOR KING CHOLERA, PUNCH MAGAZINE, 1852



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