John Snow: Breaking Barriers for Modern Epidemiology

Thesis/Historical Argument: 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.

This exhibit was created for the 2019-2020 contest season by Grace Vance and recreated with permission for this example.

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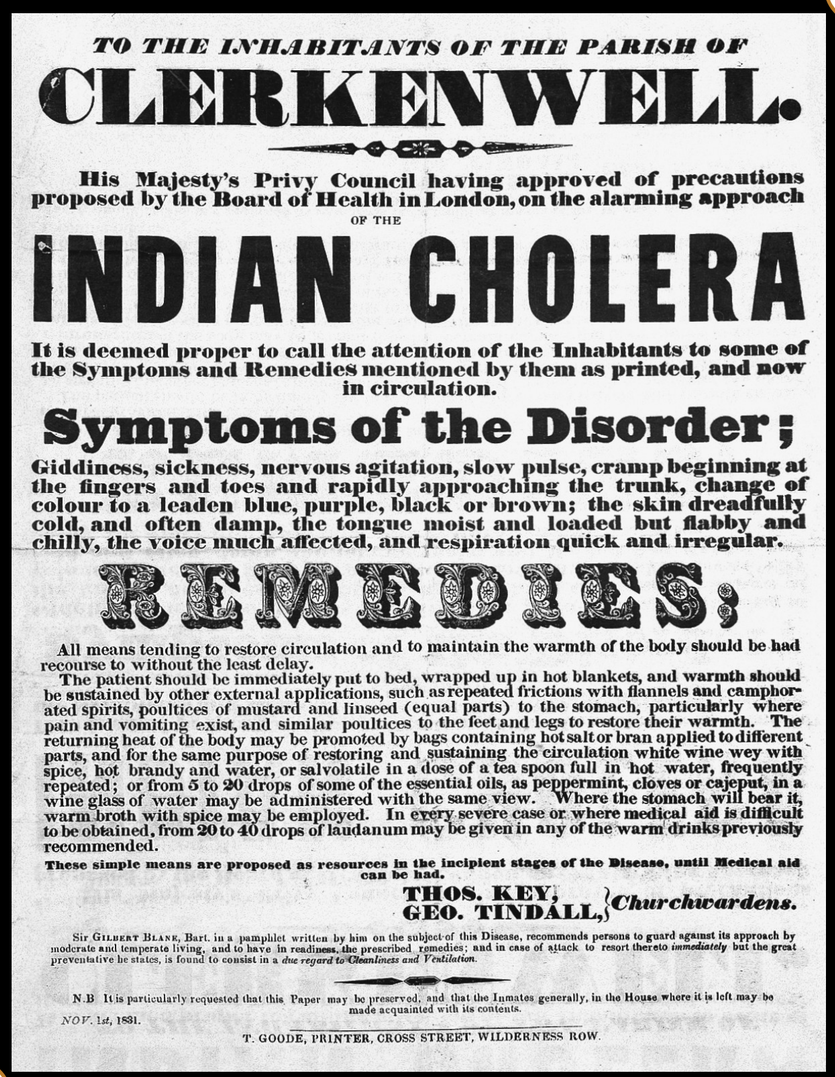


TO THE INHABITANTS OF THE PARISH OF

CLERKENWELL.

His Majesty's Privy Council having approved of precautions proposed by the Board of Health in London, on the alarming approach OF THE

INDIAN CHOLERA

It is deemed proper to call the attention of the Inhabitants to some of the Symptoms and Remedies mentioned by them as printed, and now in circulation.

Symptoms of the Disorder;

Giddiness, sickness, nervous agitation, slow pulse, cramp beginning at the fingers and toes and rapidly approaching the trunk, change of colour to a leaden blue, purple, black or brown; the skin dreadfully cold, and often damp, the tongue moist and loaded but flabby and chilly, the voice much affected, and respiration quick and irregular.

REMEDIES;

All means tending to restore circulation and to maintain the warmth of the body should be had recourse to without the least delay.

The patient should be immediately put to bed, wrapped up in hot blankets, and warmth should be sustained by other external applications, such as repeated frictions with flannels and camphorated spirits, poultices of mustard and linseed (equal parts) to the stomach, particularly where pain and vomiting exist, and similar poultices to the feet and legs to restore their warmth. The returning heat of the body may be promoted by bags containing hot salt or bran applied to different parts, and for the same purpose of restoring and sustaining the circulation white wine wey with spice, hot brandy and water, or salvolatile in a dose of a tea spoon full in hot water, frequently repeated; or from 5 to 20 drops of some of the essential oils, as peppermint, cloves or cajeput, in a wine glass of water may be administered with the same view. Where the stomach will bear it, warm broth with spice may be employed. In every severe case or where medical aid is difficult to be obtained, from 20 to 40 drops of laudanum may be given in any of the warm drinks previously recommended.

These simple means are proposed as resources in the incipient stages of the Disease, until Medical aid can be had.

THOS. KEY,
GEO. TINDALL, } *Churchwardens.*

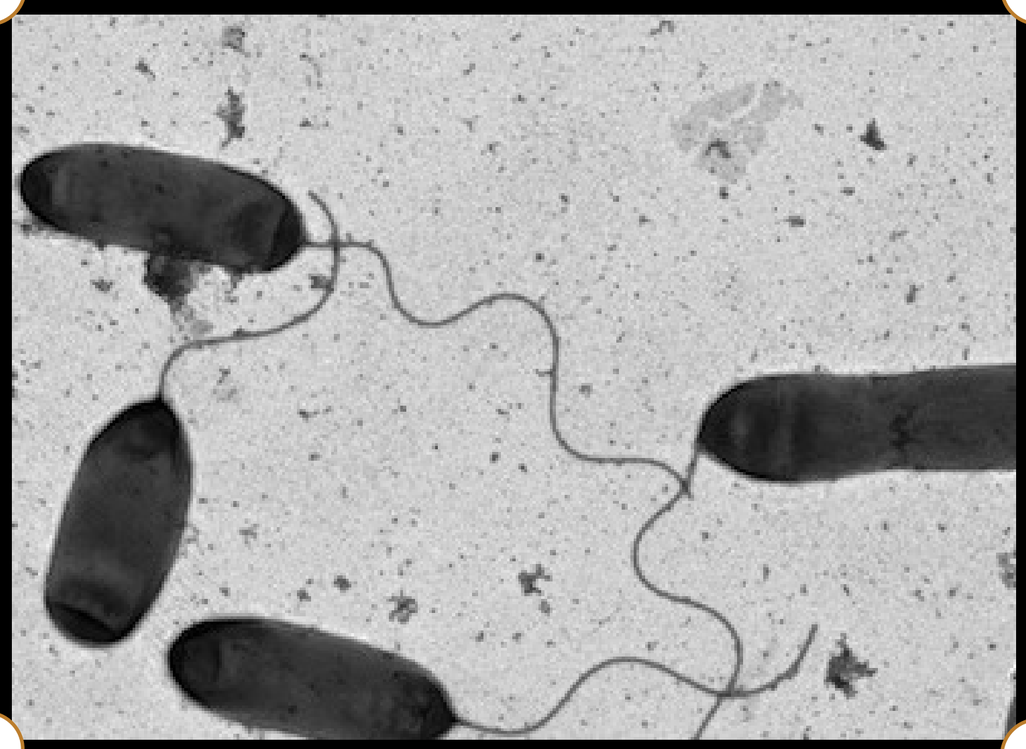
Sir GILBERT BLANE, Bart. in a pamphlet written by him on the subject of this Disease, recommends persons to guard against its approach by moderate and temperate living, and to have in readiness, the prescribed remedies; and in case of attack to resort thereto *immediately* but the great preventative he states, is found to consist in a *due regard to Cleanliness and Ventilation.*

N.B It is particularly requested that this Paper may be preserved, and that the Inmates generally, in the House where it is left may be made acquainted with its contents.

NOV. 1*st*, 1831.

T. GOODE, PRINTER, CROSS STREET, WILDERNESS ROW.

Informal Poster, Wellcome Collections, November 1, 1831



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

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.

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.

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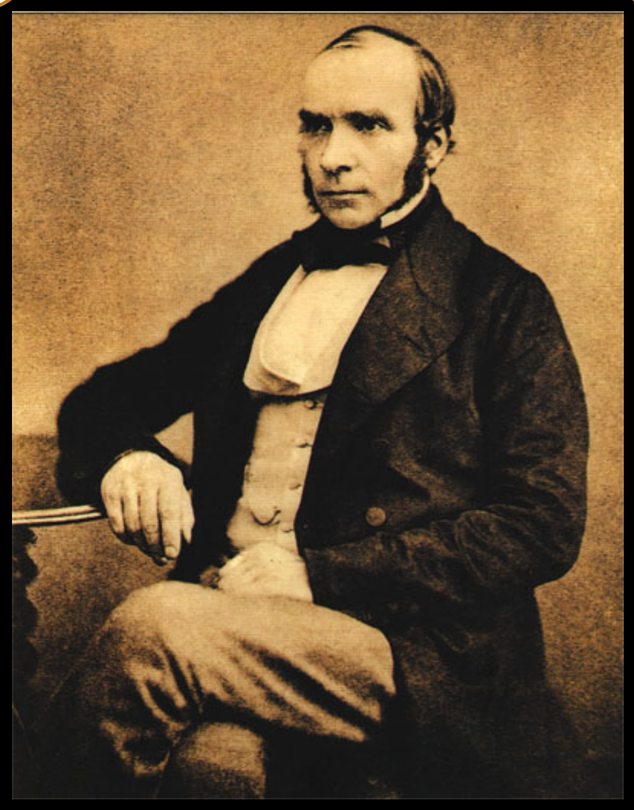
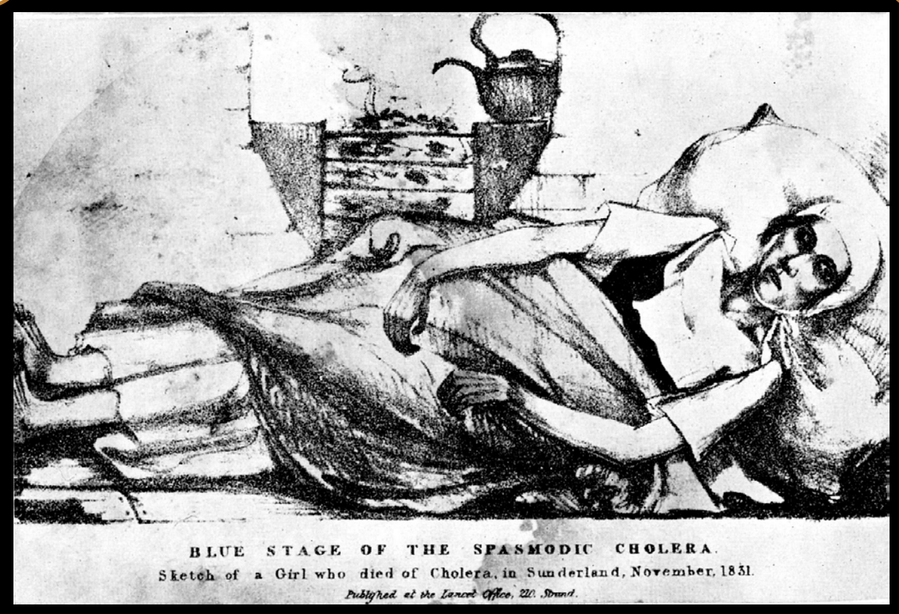


John Snow, 1857, UCLA Department of Epidemiology



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

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

THE MAN

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.

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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.

"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

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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.

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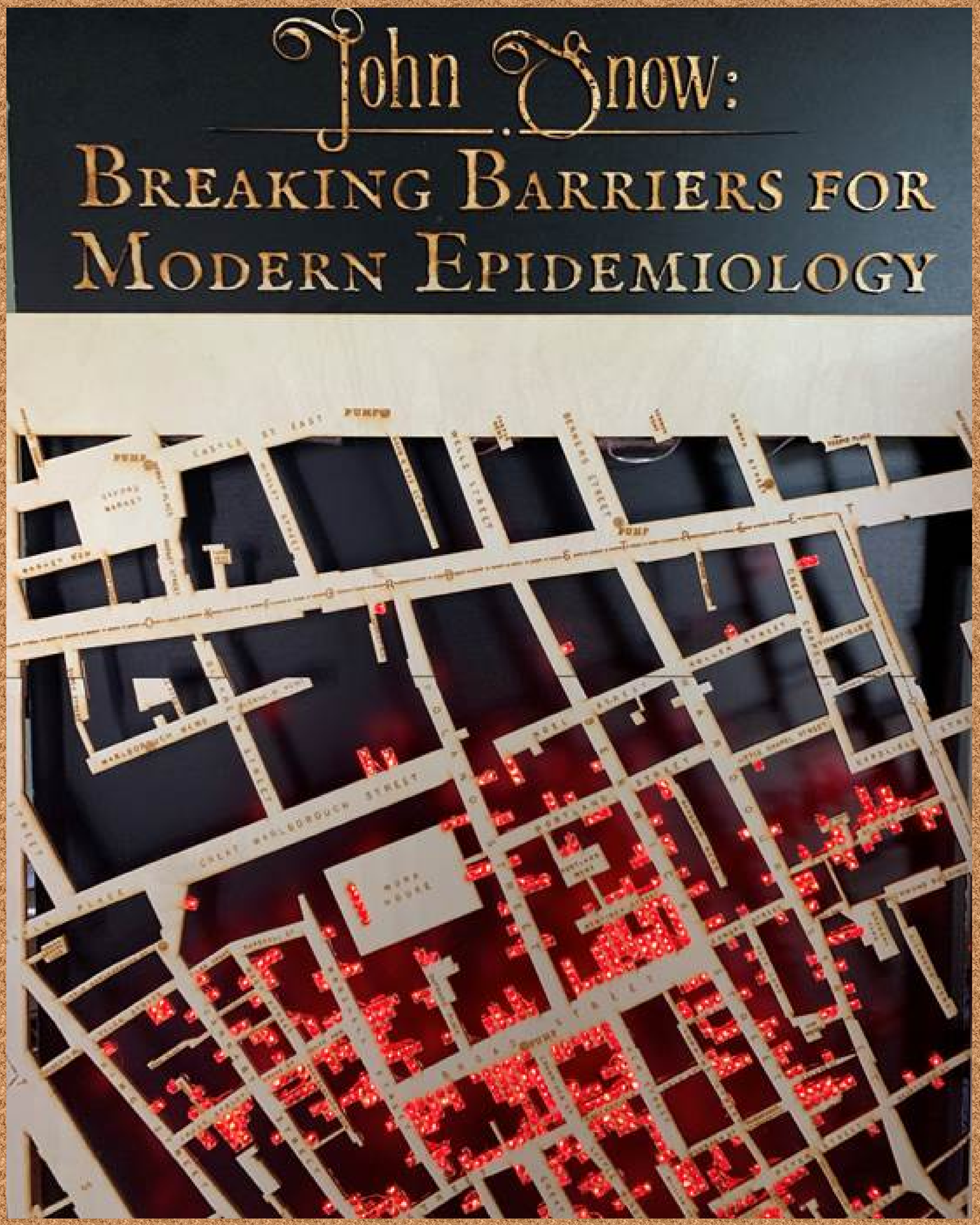

Part One: John Snow's Soho Map, 1854. Michigan State University College of Social Science.

Center Panel Center

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

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

Media Link: https://www.youtube.com/watch?v=LA4OUf-92gU

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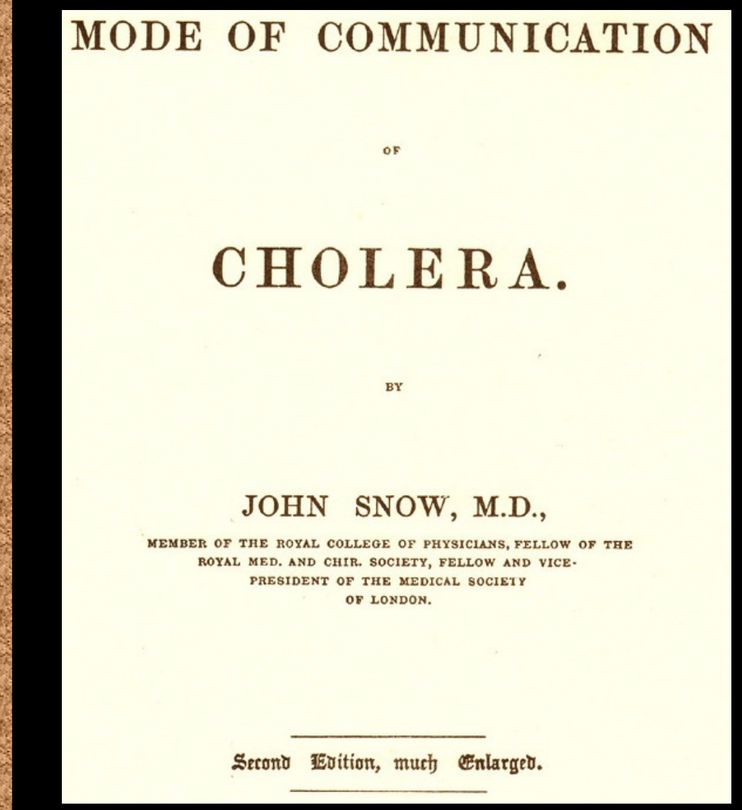
THE FINDINGS

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 successfully got the Broad Street pump handle removed. Almost immediately after, the new cases of cholera in Soho slowed to a halt.



MODE OF COMMUNICATION

OF

CHOLERA.

BY

JOHN SNOW, M.D.,

MEMBER OF THE ROYAL COLLEGE OF PHYSICIANS, FELLOW OF THE ROYAL MED. AND CHIR. SOCIETY, FELLOW AND VICE-PRESIDENT OF THE MEDICAL SOCIETY OF LONDON.

Second Edition, much Enlarged.

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

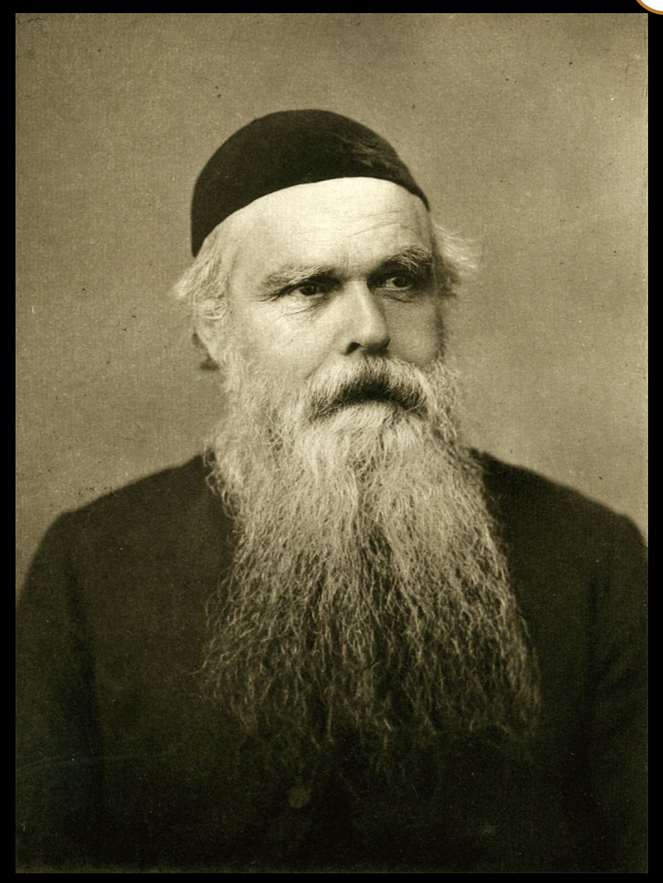
PUNCH, OR THE LONDON CHARIVARI.—JULY 3, 1858.

DIPHTHERIA. SCROFULA. CHOLERA.

FATHER THAMES INTRODUCING HIS OFFSPRING TO THE FAIR CITY OF LONDON.

(*A Design for a Fresco in the New Houses of Parliament.*)

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



Henry Whitehead, 1884, UCLA Department of Epidemiology

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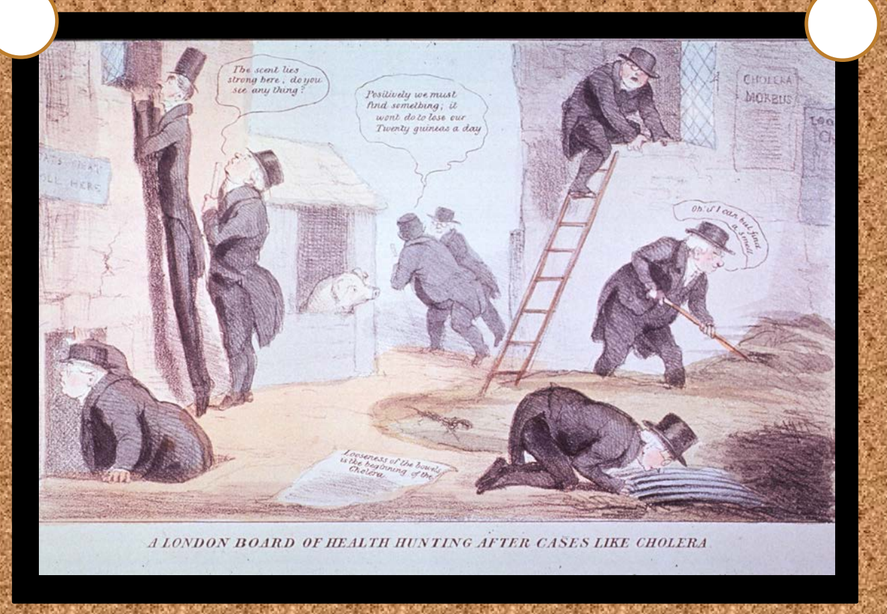
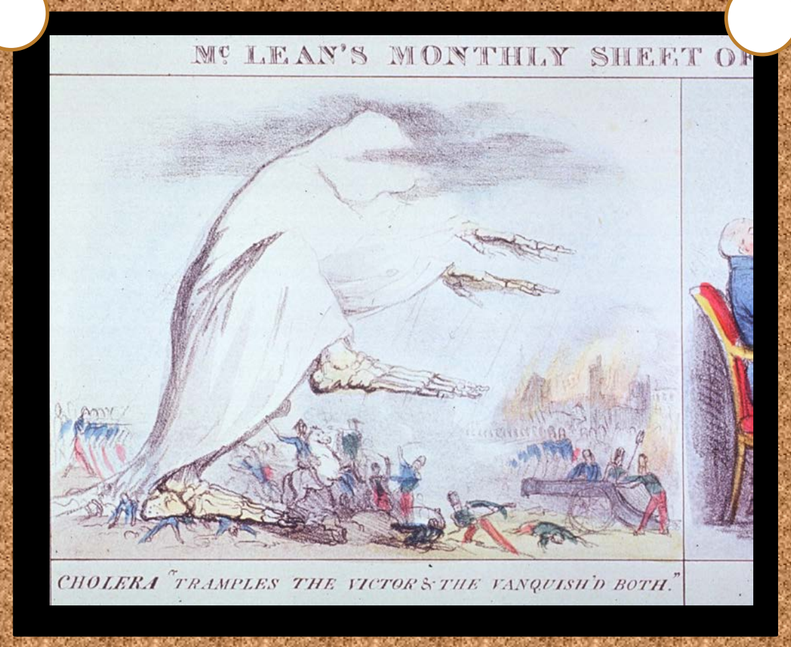


A London Board of Health Hunting After Cases Like Cholera, U.S. Library of Medicine, March 1, 1832



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

Broad Street Water Pump Memorial, Atlas Obscura

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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Snow was able to pinpoint how Cholera was spreading, but his opposers had to know why. Snow's work wasn't truly validated until the latter half of the 19th century, when it became understood that diseases were caused by microorganisms.

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..."

-William Farr, Registrar-General's
Seventeenth Annual Report on
the 1853-54 Outbreak

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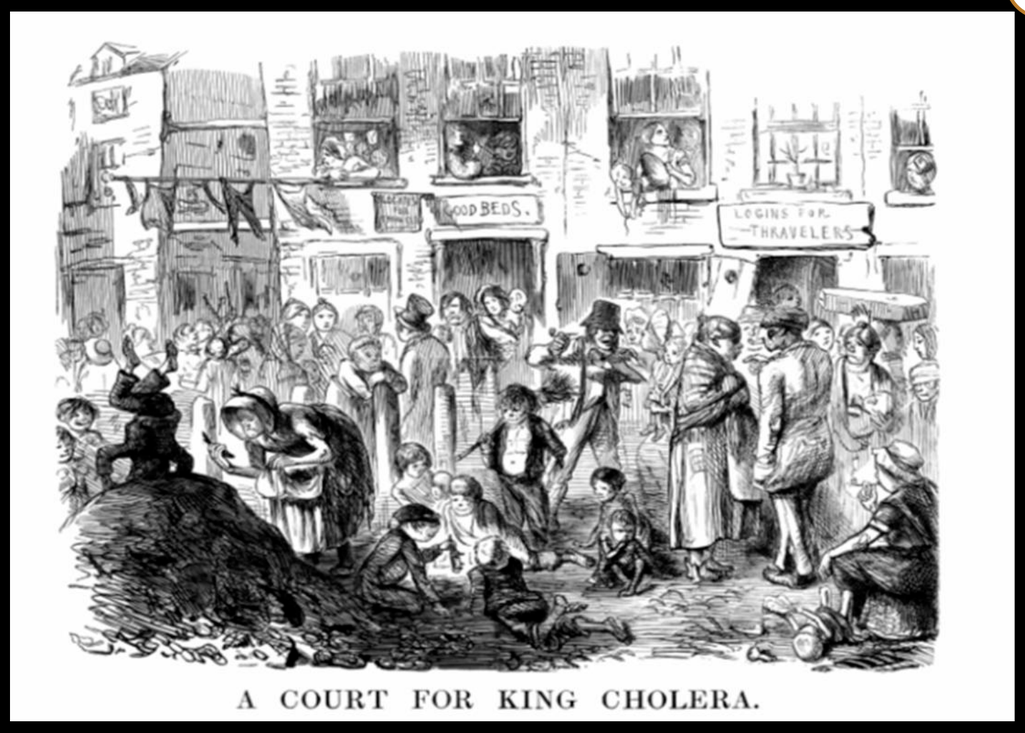

A Court for King Cholera, Punch Magazine, 1852

Interactive Coronavirus map, Johns Hopkins, 2020

This is significant to our knowledge of pathogens and their origins, as understanding how to track diseases can save countless lives.

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.

Table Space

3-D model of cholera bacteria

3-D Model of Soho water pump