



The Strange Case of the Broad Street Pump: John Snow and the Mystery of Cholera

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of John Snow, presumably the “patron saint” of surgery. A cursory inquiry would attest to the fact that Snow has traditionally been revered by surgeons because of his contributions to pulmonary physiology and, more importantly, his seminal role in the development of respiratory anesthesia. You might then wonder why Snow merits consideration with regard to a major infectious disease, cholera. In fact, Snow is also revered as the “patron saint” of epidemiology. In his introduction to Snow’s second edition of *On the Mode of Communication of Cholera*,¹ Wade Hampton Frost, the first US professor of epidemiology, described Snow’s work in the following terms:

Epidemiology at any given time is something more than the total of its established facts. It includes their orderly arrangement into chains of inference which extend more or less beyond the bounds of direct observation. Such of these chains as are well and truly laid guide investigation to the facts of the future; those that are ill-made fetter progress. . . .

A nearly perfect model is John Snow’s analysis of the epidemiology of cholera, which led him to the confident conclusion that the specific cause of the disease was a parasitic microorganism now known as the *Vibrio cholerae*.² In *The Strange Case of the Broad Street Pump*, journalist Sandra Hempel chronicles the saga of this remarkable medical scientist.

From humble beginnings in the north of England, he was the eldest child of 9 born to a laborer’s family. Through hard work and an austere lifestyle, Snow rose to a position of prominence in London’s medical community. His 6-year apprenticeship to a country doctor with extensive experience and responsibility to a mining community gave Snow a valuable basis for a special interest in respiratory disease. His medical education and his introduction to research was accomplished in London at the Westminster Hospital and the Hunterian School of Medicine. In 1846, when news reached London of the discovery of ether anesthesia in the United States, Snow immediately turned his attention to the application of this technology that revolutionized the practice of surgery. He devised instrumentation and procedures that promoted safety and efficacy for ether and chloroform anesthesia. In 1853, Snow administered chloroform to Queen Victoria for relief of labor pains during the delivery of her eighth child.

In 1848, 2 years after Snow received his medical degree and while investigating ether anesthesia, a major cholera epidemic decimated London. In a brilliant example of inductive reasoning, Snow concluded that the epidemic was propagated by drinking water contaminated by the causal agent contained in diarrheal discharges from patients. In a short pamphlet, Snow recommended washing hands after contacting a patient, avoiding drinking or using for cooking water into which drains or sewers emptied, and, if these measures were impractical, boiling water before use to prevent the disease. Hempel prefaces her description of Snow’s first edition of *On the Mode of Communication of Cholera* with extensive descriptions of the clinical manifestations of cholera and of previous epidemics and their spread.

**THE STRANGE CASE OF THE BROAD STREET PUMP:
JOHN SNOW AND THE MYSTERY OF CHOLERA**

By Sandra Hempel, 331 pp, \$24.95.
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IF YOU WERE TO VISIT THE ROYAL COLLEGE OF SURGEONS IN Lincoln’s Inn Fields in London, you would find a portrait

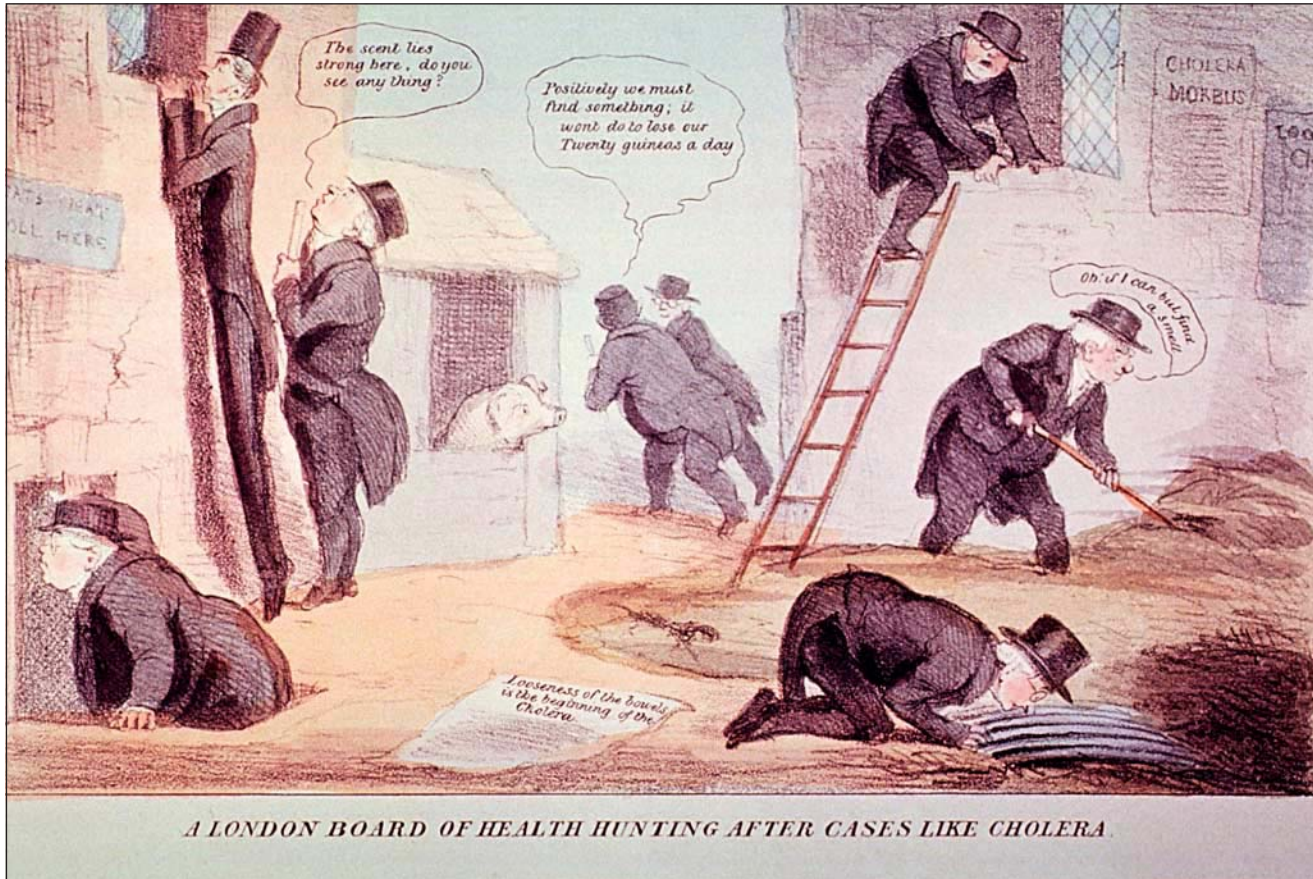


Figure. A London Board of Health Hunting After Cases Like Cholera. Courtesy of the National Library of Medicine. Lithograph by Robert Seymour (1798-1836). March 1, 1832. London. Permission to reprint courtesy of the National Library of Medicine.

In 1854, cholera was again epidemic in London. Snow decided to test his theory of transmission by drinking water in what Hempel terms the “Grand Experiment.” The results were published in the greatly expanded second edition of *On the Mode of Communication of Cholera*.² Snow knew that there was an area of London where water was delivered to homes on each street by competing distributors, one of which, Southwarck and Vauxhall, derived its supply from the Thames below major sewer outfalls and the other, the Lambeth Company, which derived its supply from the Thames above London. Using case incidence data obtained from the Registrar General and personal ascertainment of water source for each household, Snow was able to compare attack rates for consumers of contaminated water with those of consumers of relatively pure water. The results were impressive; the cholera rate in houses supplied by the Southwarck and Vauxhall Company were 8.5 times greater than the rate in houses supplied by the Lambeth Company.

While collecting data for the experiment, a serious focal outbreak of cholera occurred in Snow’s home neighborhood of Soho. He interrupted his investigations of the wa-

ter companies to address this outbreak. By case interviews and by mapping the location of infected residences, he inferred that the outbreak was due to consumption of contaminated water from a public source, the Broad Street pump. Snow recommended that the pump handle be removed, and it was. Snow got credit for aborting the epidemic but, in truth, the outbreak had largely ceased before that action. Nevertheless, Snow’s investigation of the Broad Street pump epidemic has entered the annals of medical classics.

The Strange Case of the Broad Street Pump is an easy read. Sixteen chapters and 294 pages of well-annotated text provide an informative insight into one of the great sagas of medical history.

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1. Snow J. *On the Mode of Communication of Cholera*. 2nd ed. London, England: John Churchill; 1855.
2. Frost WH. Introduction . In: Snow J. *Snow on Cholera* [reprint]. New York, NY: The Commonwealth Fund; 1936:11-39.