

## Miasmas and Other False Beliefs: The Road to Sickness and Death

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**I**T IS HARD TO BELIEVE that some people in Britain are burning cell towers in the belief that the current pandemic is caused by 5G technology. But we all see the world through our own viewpoint. Most believe the logical explanation of what we observe. But there are many who do



not. They deny science, and explain our world in terms of their fixed belief systems. And they ignore inconsistencies when they are pointed out. Think also of “anti-vaccers.”

Even within science, however, one’s world view can influence how we interpret what we observe. In 1962 the physicist, Thomas Kuhn, published a book (*The Structure of Scientific Revolutions*) describing the evolution of scientific ideas. He described how people interpret observations of nature in the context of our pre-existing theories of how the world works. If there are observed phenomena that cannot be explained by the then current “science,” it becomes necessary to discard that “world view” and postulate another that would “explain” the new observations. These “revolutions” in thought are rare but critical.

The viewpoint that the sun revolves around the Earth was first repudiated in modern times by Copernicus in 1543 (Aristarchus had suggested

heliocentrism in the 3rd century BC). Copernicus knew that the notion that the Earth was not the center of the universe would be considered heresy and, fearing persecution, waited until he was on his deathbed to publish it (He died within months of the publication). And in 1633, Galileo was con-

victed of heresy for describing the phases of Venus, and concluding that the Earth rotates around the sun. He was sentenced to house arrest for the balance of his life (10 years). Three hundred and twenty-nine years later Pope John Paul II formally apologized for the outcome of that trial.

Starting in the latter 17th century (1687) Newton’s Laws of Gravity could and did explain all physical phenomena. Radioactivity, discovered in 1895, demonstrated clearly that energy emanated spontaneously from uranium. Newton’s postulate about the conservation of mass and energy could not explain this new observation. Physics acquired a totally new world view (Einstein, 1905 and later).

The same episodic revolution of ideas has occurred in medicine. Although epidemics and plagues have recurred over the millennia, the idea that these afflictions could be caused by microorganisms such as bacteria and viruses was not easily accepted. In fact,

it was denied, even when evidence showed otherwise.

In 1845 Dr. I. Semmelweis in Vienna noted that up to 40% of women who delivered babies in the hospital died rapidly of “Puerperal Fever” (published 1849). (We know now that was streptococcal sepsis.) He also noted that the death rate was about 50% less when the babies were delivered by midwives rather than doctors. Observing the practices in the hospital, he noted that

doctors assisted in performing autopsies on their patients. Midwives were not allowed to do so. Additionally, Semmelweis observed the death from the same dis-

ease of a male doctor who had nicked his finger during an autopsy. Postulating that there was a transferable cause of disease, he made all doctors wash their hands after doing an autopsy and before delivering babies. The death rate dropped by 50%. Semmelweis’s data were clear and definitive. But his observations did not fit the then popular theory that disease was caused by miasmas, invisible vapors in the air. His published findings were ignored and he was dismissed from the hospital. He ultimately died in an asylum.

Dr. Oliver Wendell Holmes Sr. had reported similar conclusions in Boston in 1843 (republished 1855), with the

**We are hampered in our approach to this pandemic by the same problem of lack of belief in science that people had about the germ theory.**

same outcome. His results also were ignored, again because of belief in miasmas. He abandoned his work in this field but stayed in Boston. Semmelweis and Holmes never knew of each other's work.

### Germ theory

Over the next 20 years (circa 1845–1865) Louis Pasteur, Robert Koch and others demonstrated the presence of microorganisms in the air that could grow in certain nourishing media. They proposed the germ theory of disease but

it was not accepted by the medical profession. The belief in miasmas persisted.

A heat wave in London in the summer of 1858 produced the “Great Stink,” an intolerable smell from the raw sewage that drained into the Thames River in London. Epidemics of cholera (thought to be induced by miasmas) ravaged London periodically, but not during that summer of 1858, even though the “miasmas” were overpowering. But nobody noted that discordance: why was there no cholera with so many miasmas? The “Great Stink” was the impetus, however, to build the London sewer system which diverted the sewage to the Thames estuary.

Additionally, Dr. John Snow of London noted that cholera was traceable to the water supply. In 1854 he removed the handle from a municipal water pump and eliminated cholera from that area of London. His findings were noted, but again did not dispel the blind belief



Dr. John Snow (1813–1858)  
[NATIONAL LIBRARY OF MEDICINE]

in miasmas. A replica of the pump (sans handle) exists today in London at the site of the original pump.

Dr. Joseph Lister, a surgeon in Glasgow, was a believer in the germ theory and in the mid-1860s read a newspaper article from Carlisle, Scotland that described

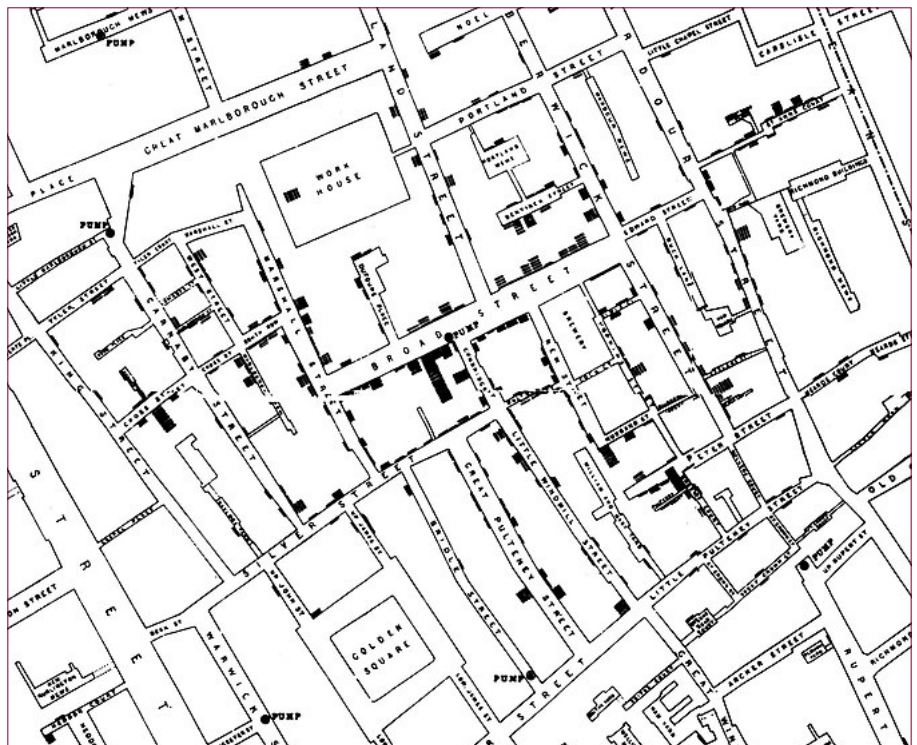
the effects of raw sewage leaching into the land adjacent to the sewage which contaminated a local river, and killed cattle grazing there. The local farmers had found that spraying the fields with carbolic acid restored the viability of the fields.

At that time compound fractures were uniformly fatal due to suppuration that Lister believed was due to bacteria rather than miasmas. He connected the pieces and published a paper in 1867 presenting cases of compound fractures treated with carbolic acid, presuming it would kill bacteria in the fracture wounds as it did in the fields of Carlisle. The carbolic acid was almost completely successful in preventing suppuration and death. This was proof of the germ theory. But even this definitive observation took a number of years to be accepted by the medical profession. It was another 14



A replica of the infamous John Snow pump was reinstalled on Broadwick Street in Soho, London, in 2018.

[THE JOHN SNOW SOCIETY AND WESTMINSTER COUNCIL]



Original map by Dr. John Snow showing the clusters of cholera cases in the London epidemic of 1854, drawn and lithographed by Charles Cheffins. [WIKIPEDIA, CREATIVE COMMONS]





### The Latest Contribution to the Germ Theory

A scientist sits at a table looking at a tiny cupid. To the right a microscope, and several containers of bacteria. The illustration first appeared in 1897, in *Harper's New Monthly Magazine*, v95, p 810. [NATIONAL LIBRARY OF MEDICINE]

years before the first patient to have an abdominal operation using antiseptic technique and not die of infection had a gastrectomy by Dr. Theodor Billroth in Vienna in 1881.

Not so long ago, in 1980, Drs. Barry Marshall and Robin Warren discovered bacteria in the stomachs of persons with ulcers. Despite universal acceptance of the germ theory, these findings initially were debunked since they did not fit the preconceived view that ulcers were caused by acid and stress (replacing miasmas). That discovery of *H pylori*

subsequently won the Nobel Prize.

The germ theory is no longer controversial. But there are people in our society who have belief systems that deny and/or ignore the effect of a scientific approach to this pandemic. Some believe that coronavirus dissemination was deliberate. Conspiracy theories, extremist sects and a lack of trust in science are widespread. The contemporary rapid dissemination of “fake news” makes false beliefs even more powerful and influential. Some continue practices that facilitate the transfer of this virus from animals. Some deny that changes in behavior, such as social isolation, will mitigate the pandemic severity. Some advocate for medications with no demonstrated effect.

Many in our society have been targets of discrimination based on color, religion, economic and other invidious bases. They have little reason to trust authority, including the scientific establishment. It is essential that we address this issue.

Erroneous belief systems die long and difficult deaths. This is not the first and will not be the last pandemic. Our very survival demands that, as a society, we address the underlying causes of false beliefs and establish an abiding trust in science. ❖

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