Past progressive

Remembering Dr. John Snow on the sesquicentennial of his death

∞ See related article on page 1736.

On June 16, 1858, the world lost a legendary medical pioneer. John Snow MD, suffered a fatal stroke while nearing completion of his book *Chloroform and Other Anesthetics*, which was edited and published later that year by his friend and biographer Dr. Benjamin Richardson.[1] At the time of his death, Snow was only 45 years old.

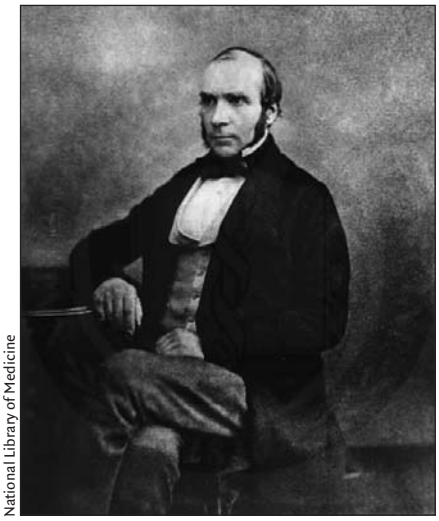
John Snow is best known for his clinical and scientific contributions to anesthesiology and his theories and research on the transmission of cholera. For the latter, he has been immortalized as a founder of modern epidemiology. Voted in 2003 by United Kingdom readers of *Hospital Doctor* magazine as the "greatest doctor of all time,"[1] Snow has left a legacy in medicine that continues to be the subject of both scholarly and popular writings. He is the focus of a number of biographical works and an array of factual and speculative papers relating to his life and professional contributions. During his short career, Snow is credited with publishing more than 100 essays, articles, books, pamphlets and letters to the editor on a variety of medical topics.[2] To anyone who has ever taken an introductory course in epidemiology or medical history, John Snow is undoubtedly a familiar name. Today, there is a professional society, a college, a government building, a public health consulting firm and a tavern bearing his name. The John Snow pub reflects a bit on irony in that Snow was a teetotaller for most of his life and a member of the Temperance Society. He was also a vegetarian and a bachelor.[1]

Snow was born into a working-class family in York, England on Mar. 15, 1813. In 1827 he began an apothecary apprenticeship in Newcastle-upon-Tyne under the direction of William Hardcastle, and in 1836 he entered the Hunterian School of Medicine in London, while gaining clinical experience at Westminster Hospital.[3] He subsequently received his bachelor of medicine in 1843 and his MD in 1844 from the University of London.

Although he began his medical career as a general practitioner, Snow is recognized as a pioneer of anesthesiology based largely on his scientific experiments with ether and chloroform. In addition to designing inhalers for their accurate delivery,[3] he was among the first to conduct scientific research related to the clinical staging of anesthesia. His research also encompassed respiratory physiology, asphyxiation, and resusitation.[4] Snow's fame in London as an accomplished anesthetist led to his being asked to provide chloroform to Queen Victoria during the deliveries of her last 2 children.[3]

Epidemiologists recognize Snow as a pioneer for his studies on the transmission of cholera during the mid-1800s. Though his views were often opposed during his lifetime, he remained convinced that cholera was transmitted primarily through contaminated drinking water via the fecal–oral route and not through miasmas as several of his medical contemporaries believed. Snow is best known for 2 investigations of cholera epidemics in London — a localized study in the Golden Square area of the Soho district and his "grand experiment" among households in South London.

In the Golden Square investigation, Snow carefully analyzed data that both supported and apparently refuted his hypothesis that the spread of cholera was waterborne. His data convinced him that a water pump on Broad Street (since renamed Broadwick Street) was the source of the outbreak. He was able to demonstrate that the preponderance of deaths occurred in households served by the pump, and households near the pump that did not succumb to cholera had largely obtained their water from other sources. Snow persuaded the local parish officials to remove the handle of the Broad Street pump, ostensibly curtailing the epidemic. In fact, the removal had little to do with ending the outbreak, which was nearly over.[5] The gesture, however, has come to symbolize, albeit inaccurately, an historic public health intervention.



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Despite weaknesses or errors in some of his theories and methods, Snow, shown here circa 1855, continues to be recognized as a significant medical pioneer.

In Snow's "grand experiment," he compared cholera death rates in households served by 2 rival water companies. Basically, 1 of these companies obtained its water from sewage-polluted portions of the Thames River and the other from a relatively unpolluted area upstream. Through painstaking investigation, Snow provided credible evidence that the cholera was transmitted by sewage-contaminated water years before the germ theory of disease was firmly established. His investigation represented a "natural experiment"; that is, an observational study mimicking an experiment due to unique and unplanned circumstances.[6] Snow wrote:

> As there is no difference whatever, either in the houses or the people receiving the supply of the two Water Companies, or in any of the physical conditions with which they are surrounded, it is obvious that no experiment could have been devised which would more thoroughly test the effect of water supply on the progress of cholera than this... (page 46).[7]

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Largely as a result of Richardson's sympathetic biography,[8] Snow has often been portrayed as a kind of angelic savior who single-handedly rescued London from the scourges of cholera and brought anesthesiology out of the dark ages. Contemporary scholarship has done much to dim Snow's halo by revealing many of his shortcomings, including weaknesses or errors in some of his theories and methods. Nevertheless, most Snow researchers continue to recognize him as a significant medical pioneer.

One of the more balanced assessments of Snow's multiple legacies is summarized in the final chapter of the well-regarded book *Cholera, Chloroform and the Science of Medicine: A Life of John Snow*[9] written by an interdisciplinary team of scholars from Michigan State University with contributions by a British anesthesiologist. Snow's most important legacy with regard to anesthesiology is perhaps bringing scientific principles to the emerging discipline, which, according to the authors, "guide inhalation anesthesia to the present day."[9] Regarding epidemiology, the authors indicate that Snow's sound scientific approach "helped to pave the way for the great sanitary triumphs that massively reduced infectious disease mortality during the twentieth century."[9]

Though Snow has made many other contributions to medicine, these should be reasons enough to remember Snow on this sesquicentennial of his passing.

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Dr. Oleckno is the author of 2 textbooks on the fundamentals of epidemiology.

Lifeworks

Where art and genetics meet

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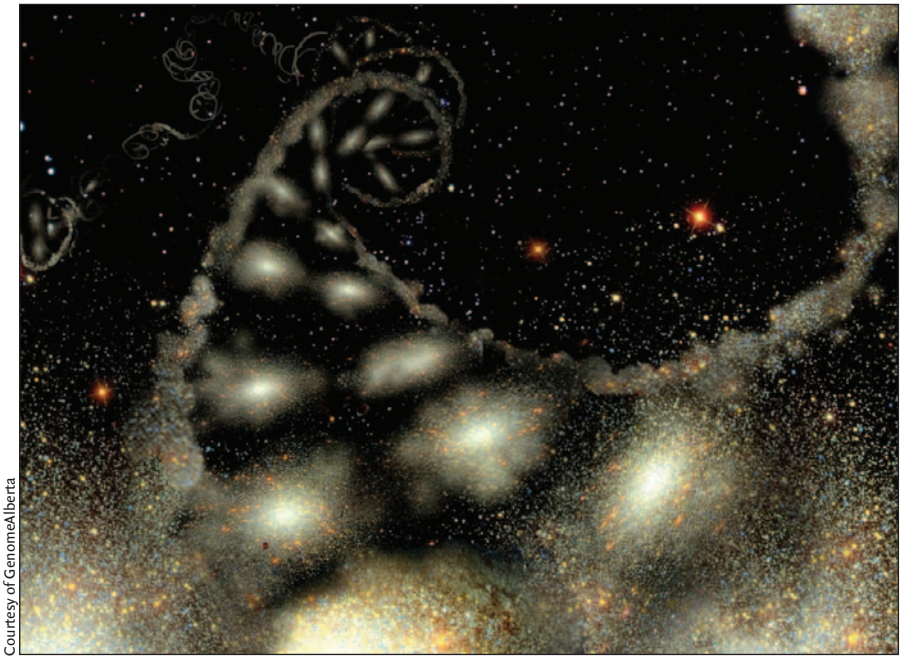
From a leaping frog to a kaleidoscope swirl, the images submitted to a first annual digital art contest and e-exhibit were hugely varied, offering intriguing interpretations of the place where visual art and genetics meet (http://genomealberta.ca/vote.aspx).

In all, works from 25 artists worldwide were submitted to the contest, which was sponsored by GenomeAlberta and Genome Canada, in conjunction with the 2008 GE3LS International Symposium. More than 800 online viewers cast votes, with the final decision being made by a panel of 4 judges, including 3 academics in medicine and art, and a vice president from Genome Canada.

Four prizes were awarded: 3 for the main contest, and an additional Genome Canada Select Prize, which was limited to Canadian entries. — Barbara Sibbald, *CMAJ*



Courtesy of GenomeAlberta

Stuart Lanctôt Kinmond, *Genomics Unleashed* (2008). Digital image. The third prize ($500) winner, from Ottawa, Ontario, explains: "In time, genetic science may enable us to remediate many problems: ill health, environmental threats, energy depletion, etc. It will also be used and abused, unleashing unimagined benefits and problems. *Genomics Unleashed* suggests the potential impact of this new science; from nucleotides to galaxies, all the universe may someday be affected and manipulated."