



## The blue death

*Disease, disaster, and the water we drink*

Robert D. Morris

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At the time of writing this book review, cholera had broken out at an unprecedented level in the capital city of Dhaka, Bangladesh. More than 1,000 patients a day were being admitted to the treatment center of the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) with severe dehydration due to cholera. In *The blue death: disease, disaster, and the water we drink*, physician and environmental epidemiologist Robert Morris discusses the history over the last 2 centuries of the impact on society of waterborne pathogens and how human waste has been separated from drinking water since the publication of John Snow's classic studies on cholera in the mid-19th century in London. Morris has served as an advisor to the Environmental Protection Agency, the Centers for Disease Control and Prevention, the NIH, and the President's Cancer Panel.

In the first section of *The blue death*, titled "Waterborne killers," Morris brings to life the personal tale of John Snow (1813–1858), one of the fathers of epidemiology, who over a short life span was able to unravel both the way in which cholera spreads and how it kills. Snow experienced the 1831 cholera epidemic in London, with its catastrophic death rates, when no cause or cure for this disease was known. Persistent in his studies of cholera, despite his primary role as anesthesiologist to Queen Victoria, Snow determined that the disease was spread by water contaminated by the waste of other cholera sufferers. He accomplished this feat in the face of intense opposition from Sir Edwin Chadwick, a champion of the Sanitarian movement and a strong pro-

ponent of the notion that cholera spread by foul odors and miasma (from the Greek for "pollution"). Sanitarians arranged for the piping of sewage into the Thames to be rid of foul odors, but in unfortunate proximity to the intake of the London water supply. Morris has transformed reams of statistical material by Snow and his contemporaries into a highly personal account of Snow's efforts, which makes for an exciting detective story. His descriptions of conditions in London and of individuals experiencing cholera are personal and graphic and relate directly to the theme of the book, which emphasizes the fragility of access to fresh, clean water, even here in the United States.

The section "Thirsty cities and dirty water" brings us to the 20th century. Morris was personally involved in and describes what was probably the largest outbreak of waterborne disease ever reported — an outbreak of the diarrheal illness cryptosporidiosis in Milwaukee in the spring of 1993. He takes the reader step by step through the events as they unfolded when the Milwaukee water supply, imbibing sewage, spread the disease-causing pathogen *Cryptosporidium* to 400,000 people, illustrating how even a water supply that is considered safe and modern can spread disease. He details how the majority of water supplies in the United States are drawn from sources into which sewage flows freely and that the current purification systems may not be sufficient and are prone to breakdowns.

Later, in "At war with the invisible," Morris writes of the present and future dependence of humans on safe, fresh water. He points out that "for every gallon of water on our planet less than half a cup is fresh

and all but one tablespoon of that is locked away in glaciers and the polar ice caps." At present, nearly half of the more than six billion people on earth lack access to improved sanitation and clean drinking water. He tells a compelling story of how New Orleans lost both its water supply and sewage disposal infrastructure overnight during Hurricane Katrina in 2005, with catastrophic results for the inhabitants of New Orleans. This story underlines how vulnerable are the systems that separate our wastes from what we drink.

Morris also describes potential harmful effects of chlorination and more briefly discusses the threat of bioterrorism to water supplies. Neither of these subjects, however, looms large in the context of the crumbling infrastructure, where water contaminated by sewage flows through our 100-year-old leaky pipes and conduits.

Morris writes authoritatively, as someone with direct field experience of cholera during the Rwanda catastrophe, in which more than 30,000 people died in several weeks, and as someone involved in investigating the Milwaukee *Cryptosporidium* outbreak. He may be forgiven for minor inaccuracies and small oversights that ultimately do not detract from the book. *The blue death* is a book I would strongly recommend to all readers. The story is told well and is important. Morris's writing is accessible to all audiences as he tells compelling personal stories to illustrate his points. The author hopes to arouse us from a pervasive complacency about one of the most vital underpinnings of organized society, a source of safe water and a way to dispose of disease-bearing waste.