

BOOK REVIEW

The Hawk's Nest Incident: America's Worst Industrial Disaster. *Martin Cherniack, MD, MPH. Yale University Press, 1986, 194 pages, \$19.95.*

Occupational health in the United States has seemingly had a bimodal history of development. Most professionals in the field today are familiar with the growth of concern, research, legislation, and regulation in the past two decades. During and after World War II, a prevailing tenet was the unlimited benefit of modern technology and industrial development; little attention was paid to consequences. However during the 1960s, research reports on the health effects of exposure to asbestos and newly synthesized chemicals coincided with a growing environmental movement to increase public concern about the risk of xenobiotics. This concern was crystallized by a mining tragedy—the death of 78 miners in a 1968 coal mine explosion in Farmington, West Virginia—leading to the passage of the Coal Mine Health and Safety Act in 1969 and later the Occupational Safety and Health Act. Many professionals have entered the field since then, and the body of knowledge has increased dramatically.

It could be easy to believe that concern about occupational health only began in the 1960s, but that is not true. Between 1900 and the 1930s, research by Dr. Alice Hamilton and others began to receive national attention, organizations such as the predecessor to the American Occupational Medical Association were established, and states enacted workers' compensation laws. Unfortunately, another tragedy in West Virginia—the death of possibly 700 men from construction of the Hawk's Nest Tunnel through Gauley Mountain—also played a key role during this earlier period of occupational health. The book by Dr. Martin Cherniack is the story of that tragedy.

In 1930, Union Carbide Corporation contracted to have a 3 mile long tunnel constructed through Gauley Mountain in southern West Virginia in order to divert water of the New River to a hydroelectric plant being built to supply electricity to its nearby industrial facilities. The tunnel, completed within 2 years, was considered a feat of civil engineering. It was soon realized, however, that a large number of the workers were dying from acute silicosis due to inhaling almost pure silica rock dust during tunnel construction. The episode led to a series of bitterly contested court cases, congressional hearings, and coverage in the national press. Because of inadequate records and conflicting testimony, the full extent of mortality was never determined at the time.

Dr. Cherniack has done an extraordinary job of reconstructing and telling the story of the tunnel construction and subsequent events. He reviewed local historical documents, court records and legal material, and medical literature of then and today.

He interviewed local residents and survivors of the tunnel construction. In order to evaluate causes and rates of mortality, he analyzed census data and death records for counties surrounding the tunnel site and for the State of West Virginia. Despite the complexity of material evaluated, Dr. Cherniack has presented the story in an elegant and engrossing manner. He not only documents the key facts and events, but he also portrays the quality of life of the migrant laborers who sought work in the tunnel during a period of economic depression. The style and tone of reporting are even-handed, although it is clear that Dr. Cherniack is an advocate of protecting the health of workers.

The book is divided into two major sections. The story itself is told in a little more than 100 pages of text and 15 pages of maps and photographs of the site taken at the time of construction. Endnotes are used to provide ample documentation without breaking the flow of the story. The second part of the book is a 60-page appendix that presents a retrospective epidemiologic study designed to estimate excess mortality among the tunnel workers. The approach and findings of the epidemiologic study are summarized in the text, so the less technically inclined reader need not read the appendix.

The assumption underlying the epidemiologic study is straightforward, yet sobering in its implication. It was hypothesized that an extraordinarily excessive rate of (non-mining-trauma) mortality among the 1,200 laborers who worked underground in the tunnel for 2 or more months could demonstrably increase the overall mortality rate in a county with 20,000 working age males. Comprehensive analyses of county and state records indicated that such an excess in total and respiratory mortality did occur during and shortly after the years of tunnel construction. The excess mortality could not be explained by other factors and did not occur in nearby, similar counties. If the observed excess mortality were due to work in the tunnel, Dr. Cherniack estimated that more than 700 men (63%) may have died within 5 years of the tunnel's completion.

The epidemiologic study is not perfect, and could never be, based on 50-year-old documents recorded before Social Security numbers were available to identify employees and before silicosis was reported as a distinct cause of death in the State of West Virginia. A large number of assumptions had to be made during the analyses. Dr. Cherniack took pains to make conservative assumptions and to provide multiple sources of corroboration for each major assumption. Nevertheless, one is left with the impression that a committed critic could find enough grist to rationalize doubts about the total attributed number of deaths. On the other hand, even if the study overestimated mortality by 100%, the actual 7-year cumulative mortality rate still would have been 32% compared to less than 7% expected. There should be no doubt that the Hawk's Nest tunnel was a major occupational health disaster.

An historical analysis must possess certain characteristics if it is to appeal to a readership already pressed with an abundance of literature. This book has those features. It is relatively short and quite readable. It informs the reader of a significant historical event, and, at the same time, it illuminates the context and motivations behind the event. These latter factors can be as relevant today as they were then. For example, one can draw parallels between the laissez-faire regulatory approach of the federal government then and now in the 1980s. In the absence of adequate regulatory restraint, the primary commitment of corporations to the "bottom line" courts a repetition of the kind of tragedy reported in this book. Finally, the analysis should

reflect the sophistication of current methods so that one is not just reading history. It is interesting to see modern epidemiologic methods applied to the analysis of this incident. In fact, the epidemiologic approach is presented so clearly that the appendix could serve as a case study for non-epidemiologists interested in undertaking an ecological community study.

The audience for this book would include occupational health professionals, labor leaders, corporate executives, lawyers, political scientists, and, of course, historians. The basic story could be read in an evening. On the other hand, one could study the appendix for days to appreciate the sophistication of Dr. Cherniack's analysis and his many months of dedicated work.

Dean Baker, MD, MPH
Division of Environmental
and Occupational Medicine,
Mount Sinai School of Medicine,
New York, NY 10029