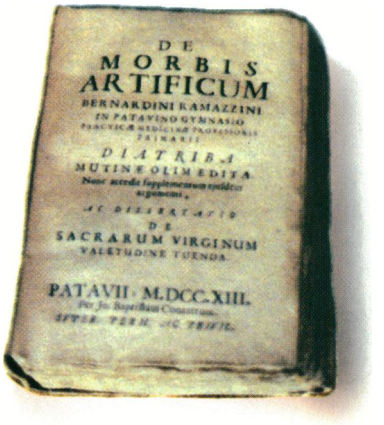
Editorial

Ramazzini: Father of Environmental Health?



On 3 November 1995, an international symposium sponsored by the Collegium Ramazzini is being held in Washington, DC. The title of the symposium is "Preventive Strategies for Living in a Chemical World" and is the second international symposium on this subject sponsored by the collegium; the first was held in Bologna, Italy, 10 years ago. Problems concerning the control of dangerous chemicals in the workplace and the environment have not decreased over these last 10 years but have instead become more urgent and, thanks to organizations like the Collegium Ramazzini, the attention of the scientific community is brought to bear on these important issues.

The Collegium Ramazzini is an international community of scholars that was founded in 1982 by the late Irving J. Selikoff of the Mount Sinai School of Medicine in New York. Selikoff was one of the foremost authorities on environmental medicine and was recognized for his pioneering work on the relationship between asbestos and lung cancer.

The Collegium Ramazzini is named for the Italian physician Bernadino Ramazzini (1633–1714), who studied diseases that he identified with specific occupations, thereby earning himself the title of "father of occupational medicine." In honor of the Collegium and in recognition of its service to environmental science, our cover features its spiritual patron, Bernadino Ramazzini. Insofar as environmental issues may arise from a general spillover of hazards from the workplace into the outside world, environmental health might be considered a subset of the issues facing occupational medicine. The work of Ramazzini founded the science of occupational medicine, although today the focus of its practioners has broadened into the field of environmental health.

"Environmental health" is a vague term that is used primarily in two ways. First, it is used to mean the effects of environmental agents on human health. Second, it is used with regard to the health status of the environment. The NIEHS was initiated to study the effects of the environment on human health. The assumption is that through understanding the mechanisms by which toxic agents influence living systems, we will come to an understanding of how toxic chemicals influence human health and disease. The term "environmental health" used in an ecological sense refers to the pollution status of the environment and how ecological systems are withstanding the onslaught. *Environmental Health Perspectives* uses the term in both senses. We are interested in the effects of toxic agents on human health as well as the toxicological status of the environment.

Occupational health and environmental health are related but are not the same discipline. For example, exposure regimens are different. In occupational health, intermittent exposures are the norm. The basic assumption regarding exposures is one of 8 hours per day for five days per week, whereas in environmental health many exposures are considered essentially continuous. The dosing route may be different. Occupational exposures might be particularly intense through inhalation, whereas environmental exposures might occur at low levels through some other route such as the drinking water. In addition, the permissible levels of exposures may differ, with generally higher levels being permitted in the occupational setting. Occupational exposures assume only adults are involved, whereas with environmental exposures the most sensitive population may be children or the sick or the aged. In addition, pregnant women may be particularly susceptible to an agent, as is the case with heavy metals such as lead, mercury, and cadmium. Occupational and environmental issues are also related in that what happens in the workplace may also affect nonworkers or people in the general population in at least two ways. For one, the worker may carry toxic materials home in contaminated clothing. Hence the need for scrupulous industrial hygiene practices. Also, many environmental pollutants, in fact, originate from the workplace in the form of air pollution or disposal of industrial wastes. Therefore, health concerns for occupational pollutants are often related to environmental health concerns, although the population is different.

As with any discipline, the foundations of environmental health are tenuous and broad. There are many who might lay claim to the title of "father of environmental health," including Paracelsus (Aureolus Theophrastus Bombastus von Hohenheim, 1493–1541), who published the first monograph dedicated to diseases of miners and smelter workers (*1*). Paracelsus also studied the toxicology of several heavy metals, and it was he who taught physicians to substitute chemical therapeutics for alchemy. Agricola (Georg Bauer, usually known as Georgius Agricola, 1494–1555) might also lay claim, having noticed the devastation caused by dust in the lungs of miners in Silesia. Agricola correctly identified the dust as the agent that caused injury to the lungs and recommended ventilation of the mines (*2*).

The industrial revolution began in Great Britain and because of human misery and disease associated with industrial activities, humanitarian interest in occupational health intensified, and many improvements in workers' conditions were achieved. Robert Owen (1771–1858) of Great Britain was a cotton manufacturer who fought for the education and health of factory workers. Owen conducted experiments in the formation of a new kind of human society based on his conviction that environment makes character and that environment is under human control (*3*), a philosophy that strikes sympathetic tones even today. He improved the conditions of his workers and prospered accordingly. Industrial reluctance to address environmental issues today is reminiscent of industrial reluctance to address workplace issues 150 years ago, when change could only be

forced through legislation or through the humanitarian disposition of a few enlightened individuals like Robert Owen. Perhaps this is the lesson of history.

The systematic study of industrial medicine also began in Great Britain during the industrial revolution. Charles Turner Thackrah (1795–1833) was a physician who, in 1831, published a book called *The Effects of the Principal Arts, Trades and Professions, and of Civic States and Habits of Living, on Health and Longevity, with Suggestions for the Removal of Many of the Agents which Produce Disease and Shorten the Duration of Life*, a title that indicates the love of scientists for lengthy titles has not changed, but which could have come straight from the pages of *Environmental Health Perspectives*. This book was extremely important in stimulating factory and health legislation that mitigated some of the worst features of the industrial revolution. Among the most important issues discussed by Thackrah were those concerned with chronic lead poisoning among house painters and potters making glazed ware. Thackrah made specific recommendations for the elimination of lead poisoning from the glazing and pottery industry. However, the issue has not gone away in spite of the intervening 164 years between then and now. In this issue of *EHP*, Romieu et al. (p. 1036) document contaminated pottery as a source of lead in children from Mexico City.

While many have contributed to the foundations of environmental health, there seems little doubt that the most valid claim to parenthood is that of Ramazzini. Ramazzini was the first physician to systematically examine the effects of workplace on human health, and his book *De Morbis Artificum*, published in 1700 (*4*), was the first treatise on the subject.

De Morbis Artificum is delightful to read. Considering the state of medical knowledge at the beginning of the 18th century, the insight of Ramazzini is truly amazing. Some of his comments reflect not only the state of medical understanding of the day but also reflect some of his own personal beliefs. His eurocentricity, normal for the time, is amusing, such as the comment found in the preface of the book: "How much the mechanical arts have contributed to the enjoyment of a more civilised life, anyone can calculate by observing what a vast difference there is between Europeans and Americans or the other barbarous races of the New World." I was particularly impressed by his insight into the pains and stresses of being a scientific editor, which I gleaned by combining insights from several sections of his book. The relevant chapters are "Diseases of Scribes and Notaries," "Diseases of Learned Men," and a little from the chapter "Diseases of Cleaners of Privies and Cesspits." Ramazzini also noted that scribes and notaries "were usually slaves or freedmen," to which I add, with only a slight touch of self-pity, might also account for the origins of scientific editors. The aggravations of being an editor are summed up thus: "The diseases brought on by sitting continually are easily understood; they are obstructions of the viscera, e.g., the liver and the spleen, indigestion in the stomache, numbness of the legs, a considerable hindrance of the circulation of the blood, and an unhealthy habit."

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References

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2. Agricola G. De Re Metallica. 1556.
3. Hunter D. The diseases of occupations, 4th ed. The English Universities Press Ltd., 1969, p. 28.
4. Ramazzini, B. De Morbis Artificum Diatriba. 1700.