The Evolution of Environmental Health
From Antiquity to the Present

by By Vincent Lafronza, EdD

Most historians attribute the creation of the field of public health to John Snow and early efforts to prevent the spread of disease and infection through basic sanitation (water purification, waste disposal, establishment of building codes, etc). In fact, the focus, organization and practice of environmental health activity as it is known today can be traced even as far back as antiquity. Moreover, some would argue that vestiges of public health activity are depicted in Roman building principles, as is readily apparent in a visit to the ruins of the city of Pompei and her advanced use of aqueducts.

Limits of modern medicine gave rise to environmental health

Regardless of its origins, we can all agree that the cornerstone of public health lies in population-based interventions. In contemporary times, the development of environmental public health in the United States was influenced, in part, from increased identification of the limitations of the medical model regarding the capacity to cure and prevent disease. In the medical science arena, for instance, early environmental public health advances during pre-antibiotic times focused on disease prevention efforts designed to address human exposure to bacterial infections. In the social sciences, and often overlooked but equally important, are historical roots of social environmental health activity. For instance, the growing necessity for the establishment of child labor laws raised public awareness and social conscience about the myriad health hazards omnipresent in the work environment produced by the industrial revolution and its continued expansion. The development of substandard housing conditions, the generation, introduction, and use of thousands of new chemicals in the twentieth century, as well as the introduction of nuclear energy, contributed to increased awareness of the connection between development (agricultural, industrial and otherwise) and negative impact on plant, animal, and human development. At the same time, incredibly irresponsible industrial waste management processes began to emerge as all-too-common patterns of American business practice, including the placement of disproportionate environmental burdens on communities of color (e.g., toxic waste sites, air and water pollution, capricious and corrupt enforcement of environmental laws, and “dirty” jobs). Wildlife and marine biologists continued to report rapid disappearances of entire species as a result of widespread environmental devastation precipitated by aggressive hunting and logging practices, ever-higher pesticide use, and habitat destruction via rapid encroachment of human activity. Many of these deleterious outcomes continue today.

Describing the components of the environmental public health system

Social forces generated by growing activism and political pressure eventually prompted congress to take governmental action, establishing the Environmental Protection Agency in 1970. This resulted primarily from recognition of the increasingly harmful impacts of human-made pollution. Since that time, an entire new discipline of environmental science developed, with vast sums of monies allocated toward advancements in environmental technology focused on environmental and ecosystem restoration. The demand for new technology and subsequent technical training programs increased markedly, prompting public and private universities and other institutions to supply a newly trained workforce. But it remained clear that protecting human health required approaches that would transcend environmental protection activities.
Over time, additional federal agencies and centers became increasingly involved in (or were created for the express purpose of) strengthening the federal capacity to protect health vis-a-vis environmental public health activities (e.g., the Centers for Disease Control and Prevention’s National Center for Environmental Health; the Agency for Toxic Substances and Disease Registry; the Occupational Safety and Health Administration, and the National Institute for Occupational Safety and Health). Today, many activities carried out by other federal agencies also contribute, albeit indirectly, to environmental public health protection (e.g., the Agency for Health Care Policy and Research, the Departments of Housing and Urban Development, Defense and Energy, the Food and Drug Administration, the Federal Emergency Management Agency, the Indian Health Service, the National Institutes of Health, the National Highway Traffic Safety Administration, and the National Oceanic Administration). Recent acknowledgement of the need for enhanced coordination and increased focus on the intersection of health, environment, transport, and agriculture has led to the establishment of a federal interagency task force within the Public Health Service. Additional coordination with and integration of agencies’ activities apart from public health is clearly warranted.

The public sector is an intricate maze of environmental protection infrastructure consisting of federal, state, tribal and local governmental agencies that possess issue-specific regulatory authority and capacity. Taken together, these federal programs enabled the United States to make significant strides in environmental and ecosystem protection and mitigation of natural and human-made disaster, including the recent identification and public legitimization of the environmental justice movement. Issues that drive today’s traditional environmental health activity in the public sector primarily relate to effective interventions that target: waste water treatment; safe drinking and recreational water sources; ambient air standards; childhood asthma and lead toxicity; indoor air quality; foodborne illness; exposure to and cleanup of household and industrial toxic chemicals/waste; facility inspections/permitting; environmental justice issues; and responsible agricultural management. In the private sector, non-profit organizations range from national groups like The Sierra Club to thousands of small, grass-roots community-based organizations, with the former often working toward enhancing environmental protections and the latter focusing on environmental public health issues. While the foci of these efforts frequently target distinct outcomes through programs and activities that inform public policy, the collective outcome would significantly impact human health if these diverse entities were working together in more integrated ways.

In the majority of states, public sector responsibility for most or all environmental activity is assigned to independent departments of environmental quality or protection, not to public health agencies. The scenario is much more confusing at a community level. This artificial separation frequently creates a sense of apartheid. Incentives to remain in isolated environments often outweigh incentives to collaborate. The gulf among medicine, transportation, public health, environmental health and environmental protection - as unique disciplines, each with their own culture, philosophy, language, methods of practice, professional preparation requirements, and funding sources - can render an impenetrable barrier to achieving effective and sustainable prevention approaches. This fragmentation is compounded by the usual differences in practice between public and private sectors as well as customary differences between state and community priorities. Even in the environmental arena, separate camps exist, which contribute to the adoption of fragmented and at times competing intervention approaches. Conservationists, for instance, contend that policy actions - both in terms of historical and current approaches - are targeted at pollution cleanup, with inadequate attention given to pollution prevention and ecosystem preservation. (It's worth noting that preservation lies in the realm of the conservationists, not the environmentalists, an interesting and often misunderstood division in what otherwise might appear to be a united, national community.) At the heart of fragmentation, as it relates to the current disconnect among environmental protection, environmental health, and public health, is the overemphasis on regulation, engineering, enforcement, and more recently, toxicology and risk assessment. These are the primary tools used in environmental protection, each guided by different assumptions, perspectives, skills, and approaches to mitigate environmental problems and to protect the health of the environment and the public.

**Coming full circle: An era of reintegration is dawning**

Despite these incongruities, the adoption of wider definitions of environmental protection is
beginning to take shape as environmentalists increasingly recognize the limitations of command-and-control approaches and are willing to explore alternative methodologies to promote cleaner environments. All of this is good for human health. But more change is needed. As we approach the new millennium, continued growth in the United States will inevitably exacerbate the need to reintegrate public health activity with environmental protection and environmental conservation efforts to improve the health status of all communities and populations, in and beyond United States' borders. A perusal of many hometown newspapers clearly depicts the continued tension among development, land use, and environmental preservation. This pressure, coupled with increased concern about neighborhood safety, responsible land use and planning approaches, urban sprawl, inequitable burdens of environmental impacts, increased asthma and cancer rates, global climate change, paucity of biking/walking trails, inadequate and costly public transportation, and emerging infectious social diseases like road rage and school violence, suggest the need for new and more "upstream" approaches to protect and improve human health. The Healthy Communities movement in the United States, for instance, has long recognized the interdependence of these and other social issues and their powerful impact on human health outcomes.

Solutions that abate negative health impacts must be targeted at "upstream" causes, such as alterations in the input and process for public policy creation that support healthy environments (e.g., promoting greater emphasis on source reduction as opposed to focusing primarily on pollution cleanup approaches). We must learn to leverage resources from the myriad public and private organizations (and movements) peppered throughout our towns, cities, regions, and states and endeavor to reconnect the public and its concerns with and ideas about environmental public health outcomes. We must learn to establish permanent interconnections among our respective domains so we can work across independent systems and their definitions to achieve greater outcomes. We must learn to increase our understanding, tolerance, appreciation, and management of inevitable conflict. We must think about, communicate, and practice environmental public health activity beyond the particular mandates of our individual organizations and jurisdictions. We must learn to be the architects of public and organizational policy that results in upstream, equitable, and morally-sound solutions to environmental problems that transcend individual choice interventions to impact positively public health outcomes. We must learn how to reconnect with and act in the best interest of the public.

Clearly, humankind will continue to interact with, harm, and even protect our environment in extremely intricate and powerful ways. The manner in which society defines and approaches environmental health issues plays a quintessential role in how it manages them. As communities strive to enhance the quality of life they afford their members, it becomes paramount that those of us who are dedicated toward improving health and positive environmental outcome learn to work together to build lasting, collaborative interdependence. The Turning Point initiative provides a unique and critical opportunity to render civil a virtual environment for collaboration, where related - and sometimes competing - interests can converge to explore the creation of effective, cooperative strategies and policies that advance environmental public health and ecosystem preservation. If we assume that the architects of the Roman aqueducts understood the significance of these complex interactions, then we would be wise to anticipate the verdict that will be reached by future generations concerning our conduct; hopefully, they will find themselves in an environment to appreciate such foresight.