

Introduction

The last half of the nineteenth century was unique in the history of medicine. For the first time in humanity's struggle against infectious disease, people recognized the role microbes play. Though inoculation and vaccination against smallpox developed long before the study of bacteria, it was not until 1882 and Robert Koch's announcement of his proof that a single type of bacteria caused tuberculosis in humans that the role of microscopic organisms in human illness stood proven. The insight Koch offered on the role of bacteria initiated a frenzied search in laboratories for pathogens. A decade after Koch's discovery, the first remedies for bacterial infection, antitoxins for diphtheria and tetanus, emerged from the new science. Science appeared to promise a future increasingly free of pain and death from infectious disease.

In the years before the great strides in bacteriology, public health organizations in some of the United States' large cities and states, as well as in major European cities, began to refine their responses to both epidemics and sanitary regulation. Pennsylvania, the most heavily industrialized state and home to the nation's second-largest population, only began to take an interest in state-level public health efforts in 1885, when, in response to an unchecked typhoid epidemic, it passed legislation to form a state board of health. The legislature invested the board with the power to investigate disease outbreaks and recommend solutions but allowed the board to do little else. The board could not, for instance, compel the abatement of nuisances or set standards of medical education and practice in the state. In 1905, in the wake of yet another appalling typhoid outbreak and under pressure from politically prominent

physicians and medical societies across the state, the legislature passed an act that provided for the formation of a modern state department of health.

The new department possessed regulatory power greater than any department in the state's history. For instance, through its mandate to protect the state's smaller waterways from pollution, especially sewage, the department could enter private property and order households and businesses to change their practices or face fines and even imprisonment. In the case of smallpox, people were ordered to accept vaccination before their children might enter a schoolhouse, regardless of the school's status as public or private. Tuberculosis sufferers, if they wished to avail themselves of state aid, moved to sanatoria far removed from their homes and families. The conduct of farmers who shared watercourses with other farms was scrutinized to ensure that no one polluted streams to such an extent that they were rendered useless to a neighbor or community. Concentrating such power in one department made politicians and the public uneasy, none more than Governor Samuel Pennypacker. He feared that private property and personal liberty might be unduly threatened by a department in the hands of the wrong sort of person.

Long before the governor appointed Samuel Gibson Dixon as commissioner of health, Dixon made a name for himself as a scientist. Born to wealthy Quakers in mid-nineteenth-century Philadelphia, Dixon earned degrees in law and medicine from the University of Pennsylvania. In 1889, Dixon founded the University of Pennsylvania's novel hygiene (public health) laboratory, arguably the first of its kind in the nation. Later that year, Dixon proved that the tubercle bacillus could be attenuated, and attenuated bacteria, or so believed many researchers, held the key to a vaccine or cure. Dixon's achievement predated a similar finding by Koch by almost a year, though Dixon received almost no credit for his work, an affair this study explains and hopes to redress. In a similar vein, Dixon developed a remedy for tuberculosis that resembled Koch's tuberculin, though Dixon was transparent about the process behind his formula and it did not lead to the deaths and controversy that surrounded Koch's infamous tuberculin. Furthermore, Dixon refused to test his fluid on people until he was certain that he had cut the risk to people as much as possible. His refusal to test on human subjects was guided by his philosophic understanding of the nature and purpose of science, as well as his profound respect for human life. In 1890, Dixon accepted a position as professor of bacteriology and microscopic technology at the Academy of Natural Sciences of Philadelphia, a faded research institution. By 1895, the academy offered Dixon its presidency, a position Dixon held until his death. Under his stewardship, the

academy was recognized as one of the preeminent scientific research institutions in North America, its power particularly felt in ornithology, geology, paleontology, and several branches of zoology.

When Governor Pennypacker tapped Dixon for head of state health, neither could have predicted that Dixon would serve for twelve years under four governors. Among the most important of Dixon's achievements while in office, and by a wide margin the best known by scholars, was construction of the world's most comprehensive system of tuberculosis control and treatment. But beyond the conditions in and the efficacy of this system, little scholarship about Dixon and his department has emerged. This is understandable to some degree, as the antituberculosis campaign Dixon constructed and led remains unquestionably the largest, most varied experiment in tuberculosis control in the United States', or any nation's, history. But Dixon was not wholly, or even mostly, occupied by tuberculosis control during his time as commissioner. In the cases of diphtheria and tetanus, for instance, within eighteen months of his appointment, Dixon's attention to antitoxin distribution, especially among the poor and in rural areas, changed the contours of those diseases in the state, diseases for which remedies had been available for more than a decade by Dixon's first year in office. Meanwhile, rates of sickness and death from waterborne illnesses, a category of mortality in which Pennsylvania routinely ranked at or near the top, dropped throughout the state, in every county and virtually every incorporated community, not because science had developed new methods of water treatment but because Dixon and the department aggressively applied pertinent sanitary and health laws. Dixon also enjoyed an international reach through his weekly "little health notes," which were syndicated by newspapers across the Western world and India, as well as through his reputation as a medical consultant throughout the United States and abroad.

Beyond the general point that public health and medical reform are not only the products of scientific discovery but rather a conversation between what science can offer and what society will accept are two more precise points. The first addresses the extent to which Dixon was personally responsible for the health department's structure, activities, and outcomes. It is the contention of this book that Dixon was the prime force behind the department's work. While the structure of the department and the laws within which it operated were the product of several reform voices, including Dixon's, once the department was constituted, it is impossible to understand the manner in which it conducted the state's business without understanding

Dixon. His centrality to the department, as both its public face and its senior executive officer, was such that the reader is warned that the terms “Dixon” and “department” are often used interchangeably. This is no mistake insofar as the battles the department elected to wage against menaces to the commonwealth’s health in communities, clinics, and courts, and even the health menaces against which Dixon—and therefore the department—turned a blind eye, were the products of Dixon’s decisions. In this context, it is important to know something about the man who came to make such decisions.

Finally, this study argues that Dixon was a classic progressive insofar as he believed technology, coupled with responsible government, offered the surest path to a healthful future. Like many actors lumped into the progressive era of reforms, Dixon concentrated on a narrow range of societal improvements. In Dixon’s case, those reforms concentrated on implementation of a suite of disease-prevention and disease-curing interventions. Furthermore, Dixon wished to harness the power of the government to force those reforms even in areas where politicians, special interests, and the community itself resisted. Though he did not involve himself or the department in political reformations, he openly stated his opposition to interference by any political bosses in the management of the department of health and, on several occasions, took risks by drawing lines with political leaders, and when officials crossed those lines, Dixon waged public fights to enforce his prerogatives. The myriad improvements to the environment and people’s health made by the department under Dixon’s aegis are among the mainstays of the achievements historians quantify as results of progressive reforms. This study hopes to place Dixon as a central figure in Pennsylvania’s history of progressive reforms and, as measured by lives saved, the most successful reformer in the commonwealth’s history.

The life of Dixon captures the changes wrought by the germ theory and the public health efforts it motivated. His authority and influence were not limited to any one city but extended to every corner of the state and through national and international organizations. Scholars of US public health often focused their efforts on municipal health and its leaders, as in the cases of Hermann Biggs and Charles V. Chapin, both powerful figures in local public health who effected significant reform in the urban areas in which they worked. In this vein, perhaps the best biography of a public health leader is James H. Cassedy’s *Charles V. Chapin and the Public Health Movement*. Cassedy concentrated on Chapin’s contributions to public health through a detailed examination of his stewardship of the Providence, Rhode Island, board of

health. Other works, such as Judith Walzer Leavitt's *The Healthiest City: Milwaukee and the Politics of Health Reform* and John Duffy's *A History of Public Health in New York City, 1866–1966*, are superb studies of municipal health work from the organizational level. Of particular interest to the scholar of state public health work is Barbara Gutmann Rosenkrantz's *Public Health and the State: Changing Views in Massachusetts, 1842–1936*. Published in 1972, Rosenkrantz's book broke new ground in distinguishing public health from medicine / public medicine and provided crucial insights into how public health and medicine were at times merged under the direction of the state. Martin V. Melosi's meticulous study of urban sanitary infrastructure, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present*, underscores the critical importance of the civil engineer in any discussion of public health. Finally, John Duffy offered a compelling and comprehensive look at public health history throughout the United States in his study *The Sanitarians: A History of American Public Health*. No monograph traces the development of a state department of health through the work of a long-term director of health. In the case of Pennsylvania, the historiography includes numerous works on the health and medicine of Philadelphia and Pittsburgh, including Michael P. McCarthy's *Typhoid and the Politics of Public Health in Nineteenth Century Philadelphia*, Sam Alewitz's "*Filthy Dirty*": *A Social History of Unsanitary Philadelphia in the Late Nineteenth Century*, and Joel Tarr's *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective*.

Closer to the story of Dixon is Barbara Bates's critical study of the sanatorium treatment of tuberculosis, *Bargaining for Life: A Social History of Tuberculosis, 1876–1938*, which examines the lives of tuberculosis sufferers and the career of the leading tuberculosis expert and sanatorium champion Lawrence F. Flick in the period before antibiotic treatment of the disease. Any scholar of Dixon or Pennsylvania's campaign against tuberculosis is indebted to Bates's painstaking explication of private and public sanatoria care in the commonwealth. Dixon's influence on the fight against tuberculosis in Pennsylvania extended even to the state's private sanatoria, which relied on annual infusions of public money to continue operations, Flick's sanatorium included. A great deal of the criticism Bates leveled at the state's efforts, and at Dixon, is explored in chapter 7. Likewise, Vera Blinn Reber's article "The Sanatorium Age: Pennsylvania and Argentina, 1900–1945," compares the rise of tuberculosis sanatoria in Pennsylvania, under Dixon's aegis, and in Argentina. Reber's findings included the remarkable similarity between the social class of patients at sanatoria in Argentina and Pennsylvania, as well as

the rigorous experience of sanatorium life, including separation from family and the constant deaths of fellow patients. Reber also highlighted the camaraderie that life in a sanatorium inspired between patients. Two studies of tuberculosis in the United States, Georgina D. Feldberg's *Disease and Class: Tuberculosis and the Shaping of Modern North American Society* and Michael E. Teller's *The Tuberculosis Movement: A Public Health Campaign in the Progressive Era*, informed this study of tuberculosis and Dixon in a general way, though Pennsylvania was noted for its gargantuan antituberculosis program. A biography of Dixon offers an opportunity to fill gaps in the historiography of state-level public health management. Additionally, Dixon's work on *Mycobacterium tuberculosis* firmly positioned a Pennsylvanian/American scientist on the forefront of research into the mechanics of the deadliest disease of the nineteenth century.

Because Dixon was a public figure, much of his career was chronicled by the press and in government reports. The Academy of Natural Sciences of Philadelphia maintains a collection of his papers that pertain to his presidency of the academy, including correspondence with researchers who wrote and telegraphed him from seemingly every corner of the United States and Colombia with progress on the capture and identification of birds and the discovery of bones indicative of new species of dinosaurs and mammals. Also noted are improvements in the building housing the academy as well as personnel changes. Alas, this book concentrates on Dixon's explicitly public health work and offers only a cursory examination of the most important episodes during Dixon's management of the academy.

The bulk of Dixon's papers rest in the Historical Society of Pennsylvania. They cover his experiments on tuberculosis, his correspondence with eminent European scientists, his role in the department of health, scores of his "little health talks," records of his activities with the American Kennel Club (Dixon was a founding member), and even unique designs for devices intended to improve the sanitation of the American home. As comprehensive as the archival resources are concerning Dixon's professional life, they offer only tantalizing clues about his personal life. Dixon left no diary, no real window into his mind. No account of his marriage or his relationship with his daughter exists, and the researcher has few resources to peer into Dixon's reflections on relationships. The archival material is also silent about Dixon's relations with powerful Pennsylvania politicians and business leaders, two groups that he worked with and opposed as the situation warranted. In short, posterity is left with a comprehensive picture of Dixon's professional

development but very little of the substance of the more personal details of his life. The result is a biography of Samuel Dixon that concentrates on his career as a physician, researcher, and public health advocate without many of the details one wishes to know about a person. In places, the narrative is forced by necessity to reconstruct Dixon's motivations and suggest his reasoning when details are murky or nonexistent.