History of the public health movement in the United States, 1850 to 1900

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HISTORY OF THE PUBLIC HEALTH MOVEMENT
IN THE UNITED STATES, 1850 TO 1900

by

Howard D. Kramer

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, in the Department of History, in the Graduate College of the State University of Iowa

May, 1942
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INTRODUCTION

To explore in one short work every ramification of the public health movement in the United States is not possible, nor can any treatment of such a broad field as this avoid all pitfalls. In most studies dealing with the subject, the many different phases of the movement are sketched separately and then painted into the larger canvas of the public health movement. Food adulteration, milk supply, housing, clothing, sewerage, water supplies, bacteriology, ventilation and plumbing, vital statistics, health laws, health administration, voluntary health organizations, public health nursing, quarantine, communicable diseases — these and a host of other topics belong in any complete or detailed story of preventive medicine.

Yet there exists a definite place for a more general survey. Several such studies have been written, but they have either concentrated on the medical aspects of the subject or on its legislative and administrative side. The story of how the people themselves viewed the public health movement has been largely neglected. In the following pages an attempt has been made to describe the reaction of the general public to the progress of
preventive health work in the United States.

To a very great degree newspapers and periodical articles had to be relied on for gauging public opinion. The statements of prominent sanitarians also proved of great value in this connection.

The important milestones of the public health movement have served as the framework on which the story is built. But it has not been feasible to record every triumph or every disappointment of those who battled for health reform, nor to trace the steps of the public health movement in every state or metropolitan center of the nation. Only those triumphs that resulted in more effective control over disease and only those cities and states that initiated significant reforms could be taken up in any detail. This, however, need not stand in the way of an understanding of the larger public health program, for the more backward states and communities merely modeled their health measures after the examples set by the leaders.

Much the same problem was encountered when it came time to introduce the men who played leading roles in advancing the cause of public health. Their names were many. Not all could be included, so only the more
outstanding of them or the more articulate personalities have been mentioned.

The above considerations have ruled the choice of material from the vast amount available. No doubt much has been omitted that others will think should have been included. For all such faults of omission, selection, and emphasis, the writer accepts full responsibility. He also wishes, at this time, to thank Professor Louis Pelzer for his most helpful comments and criticisms during the preparation of this study.
Chapter I
THE MASSACHUSETTS SANITARY REPORT

The first and foremost battle-field of public health reform was the modern city. Urban life, by being less favorable to health than the country, eventually forced society to conduct a rigorous self-inspection. When a horrified humanity became stirred into action by what it discovered, the city, fortunately enough, provided better defense against disease and more effective means for its cure than rural areas.

It is not the purpose here to list the many factors which encouraged the development of great metropolitan centers in the nineteenth century. Enough to say that once the city had justified itself economically, it had another duty to perform. Sooner or later, if it were to survive, it had to make itself a safe and a healthy place to live.

Public health1 is the name given to those measures

1 The very breadth of sanitary science, which is a combination of a great number of sciences and arts, defies a precise definition. If public health is to be defined at all, it must be in terms of its ultimate purpose. Nevertheless, for the reader's reference, two definitions composed by qualified sanitarians are here given.

C.-E. A. Winslow has defined public health as "the science and the art of preventing disease, prolonging life,
and devices employed to achieve this vitally needed sanitary reform. Occasional laws or isolated regulations specifically designed to protect the citizens of a state from disease can be found throughout history, but not until the middle of the nineteenth century was a fully-developed, enlightened program first put into effect. Naturally enough, England led the way in public health reform. Her manufacturing cities, a consequence of her advanced industrialization, gave rise to squalid living conditions which attracted the eye, then the indignation of social reformers of the

and promoting health and efficiency through organized community effort for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health." Winslow, "The Untilled Fields of Public Health," Science (Cambridge, Massachusetts), n.s., LI, 1920, p. 20.

George M. Kober narrows the above definition: "The application of the precepts of hygiene . . . is generally subdivided into personal and public hygiene. In the former, the rules of hygiene are applied to individuals; in the latter, to nations or communities . . . . When the State promulgates sanitary laws or rules for the protection of its citizens, the term 'public health,' or 'state medicine,' has been chosen to designate this activity." Kober, "Progress in Health Conservation in the Last Fifty Years," United States Public Health Reports (Treasury Department, Washington, D.C.), XXXVIII, Part I, 1923, p. 725.

In this study the term will be used, it is hoped, at all times in such a way that no confusion shall arise regarding the exact meaning.
1830's. Men imbued with the spirit of the New Humanity — Edwin Chadwick, Dr. Southwood Smith, Lord Ashley, Robert Owen — waged bitter war against poverty, misery, and disease. One result of their efforts was the Public Health Act of 1848, marking the legal birth of sanitary reform.

This English example had an effect on the United States scarcely to be overestimated. Yet it would be a mistake to say that the latter merely copied the English program. The agitation for public health in America, although conforming in general to the pattern of the English movement, followed a distinct course of its own.

Before the initial step toward sanitary reform could be taken, the United States had to recognize that a sanitary problem existed. Recognition came slowly. Americans had watched with complete approval the crusade of Chadwick and others to remedy the vile living conditions of the poor in England's teeming cities.2 The Report of

the Poor Law Commissioners for 1840 drew from leading American periodicals searing indictments of the slum quarters in foreign lands. Aghast at the picture presented by the English report but with their gaze fixed high above what lay at their own feet, New World commentators complacently offered fervent thanks that the manufacturing classes of America had escaped the poverty and degradation of Europe.3 Here and there some doubt was cast on the permanence of this escape — some worry lest the United States in another twenty-five years might not "exhibit some of the dreadful scenes which now sicken us when we look abroad."4

It was not necessary to wait so long. By 1847 the larger cities in America could duplicate many of the

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3 [Bowen], "Social Condition of England," loc. cit., 504; Princeton Review, XIII, 1841, pp. 124-127, 441, 445-446; [Ralph Waldo Emerson], "The Young American," The Dial (Boston), April, 1844, p. 487; and see also "Social Tendencies," The Dial, October, 1843, p. 195, which inveighs against "ephemeral reforms" and justifies, by a typical Malthusian viewpoint, social evils.

harrowing scenes portrayed in the Poor Law Report of 1840, a disclosure brought to light by a survey of some dozen cities conducted by the newly formed American Medical Association.\textsuperscript{5} The amazing growth of cities was responsible for this new social problem. Starting about 1820 both the size and the number of American cities had shot upwards out of all proportion to former growth; between 1820 and 1830 the number of towns of more than 8,000 inhabitants doubled in the United States, and almost doubled again in the next decade. The greatest percentage gains in urban population came in the 1840's.\textsuperscript{6} New York grew from 300,000 to half a million, Buffalo from 18,000 to 42,000, Chicago from 5,000 to 30,000. By 1860 New York had increased its population to 800,000, Philadelphia had passed the half million mark, and six other American cities contained more than 100,000 inhabitants.\textsuperscript{7}

Such rapid growth tended to outrun the forces of law and order, and to smother under the weight of numbers

\textsuperscript{5}American Medical Association Transactions (Philadelphia), II, 1849, pp. 431 ff. The association was founded in 1847.


\textsuperscript{7}Arthur M. Schlesinger, "The City in American History," Mississippi Valley Historical Review (Cedar Rapids, Iowa), XXVII, 1940, p. 51.
any attempts at civic reform. Before public health measures could be adopted or enforced, other more pressing problems had to be solved. An effective police force, the first requisite of community life, did not make its appearance in the Atlantic seaboard cities until 1853, and satisfactory fire prevention came even later. Protection against the dirt and filth of human aggregation, which threatened the life of every man, woman, and child, had to wait upon the adequate enforcement of law and order.8

The desirability of some supervision over the health of the community did not go entirely unacknowledged, nevertheless. Even as early as 1830 most of the larger American cities had boards of health. Measured in practical results this meant little. Usually these boards were composed of the mayor and several aldermen, and only convened when an epidemic knocked at the gates of the city.9 When compelled by an emergency to adopt immediate sanitary regulations, the frantic activity of these boards frequently did more harm than good; the board of health was "more to be feared than the pestilence," declared an early mayor


of New York, who refused to convolve it during an epidemic of cholera.\textsuperscript{10}

Seldom if ever did these makeshift boards of health pay any attention to the living conditions responsible for endemic diseases. However, by the late 1840's the slum districts of the larger cities had become so objectionable that civic-minded citizens could no longer blindly disregard the social evil in their midst. New York at this time housed more than 18,000 persons in damp, disease-breeding cellars, and the poor of Boston, according to an accusation of the \textit{North American Review}, were "now worse lodged than their brethren in the foulest and most crowded districts of the large cities of Europe.\textsuperscript{11} In external appearance the poorer quarters of the typical American city presented a scene of utmost disorder and confusion. Narrow, unpaved streets easily became transformed into quagmires when it rained. Rickety tenements, swarming with unwashed humanity, leaned upon each other for support. Inadequate drainage systems failed to carry away sewage, and outside privies bordered almost every thoroughfare. Slaughterhouses and fertilizing plants for their part contaminated

\textsuperscript{10}Stephen Smith, \textit{The City That Was} (New York, 1911), 166.

\textsuperscript{11}\textit{North American Review}, LXIV, 1847, p. 266.
the air with an indescribable stench. Under these condi-
tions it was not surprising that by 1850 the average span
of life in Boston and other American cities was less than
in London\textsuperscript{12} — a metropolis which but a few years before
had received such scorching criticism at the hands of Amer-
icans for its "sickening" scenes of misery and depravity.

As the similarities of English and American urban
conditions became more and more pronounced, the noteworthy
achievements of the English health laws did a great deal to
stimulate the public health movement in the United States.
Another development of the 1840's that awakened the Ameri-
can people to the dangerous absence of adequate sanitation
in their communities was the progress made in the collec-
tion and interpretation of vital statistics.

The want of accurate mortality records was early
deprecated in America. "To know what will promote the wel-
fare of the people, and what will be prejudicial to them,
it is quite material to know the facts relative to the
population."\textsuperscript{13} Previous to 1830 the registration of births,
marriages, and deaths had been left to the sextons of
churches, an arrangement that did not lead to dependable

\textsuperscript{12}Ibid., 267.

\textsuperscript{13}[W. Phillips], "Registration Law in Massachusetts,"
North American Review, LXI, 1845, pp. 250-253, especially
252.
results. Later, doctors lent their aid to the compilation of mortality statistics, but this brought no great improvement.\textsuperscript{14} It was soon realized that in order to obtain accurate annual statistics the government must assume responsibility for their collection.\textsuperscript{15}

The first move in this direction was taken by the state of Massachusetts, with the enactment of a compulsory registration law in 1842.\textsuperscript{16} Although the first reports under the new law were far from perfect, each year saw an appreciable gain in their accuracy.\textsuperscript{17} Unhappily, with the exception of New York, other states were slow to follow this example.\textsuperscript{18} Municipal governments had more success. Four large cities, New York, Boston, Philadelphia, and New Orleans, had been keeping track of their annual death rate since 1815, but their records for the early years were...
mostly in the nature of rough estimations. Strangely enough, business, so often the bête noire of reform, contributed nearly as much as government toward raising the standards of accuracy; the advent of insurance companies in America a few years before the half century mark and their astonishing popularity in the decade before the Civil War led to considerable refinement in the interpretation of vital statistics.\footnote{One of the first findings of these insurance companies showed that sickness and mortality did not necessarily have a direct correlation, which was commonly assumed by public health agitators of that day. See "The Law of Sickness, and Its Application to Health Insurance and Benefit Societies," \textit{Hunt's Merchants' Magazine and Commercial Review} (New York), \textbf{XIX}, 1848, p. 605. Although health insurance of a sort had been practiced in America before 1840 through means of benevolent societies, the public did not really become insurance-conscious until the establishment of commercial companies, beginning about 1843. Then the practice of insuring one's life spread so rapidly that by 1856 the editor of \textit{Hunt's Merchants' Magazine} devoted considerable space to discussing the question, "Does a Man Shorten His Life by Insuring It?" The main objection to life insurance appeared to be that "the lives of persons insured were frequently tampered with. They were encouraged to dissipation, drink, and the means of procuring drink were constantly placed within their reach, and there had been cases of men whose lives were insured, who had been urged to ride steeple chases by persons to whom their policies had been assigned." Ibid., \textbf{XXXV}, 1856, p. 110. It is a revealing commentary on the discredited status of the medical profession at that time that all insurance companies, without exception it seems, refused to insure the wives of surgeons! Ibid. For the contributions made by insurance companies in America to the collection and tabulation of vital statistics, see Frederick L. Hoffman, "American Mortality Progress during the Last Half Century," in Mazyck P. Ravenel, ed., \textit{A Half Century of Public Health} (New York, 1921), 94-117; also "Responsibility of Government for the Public Health," \textit{National Quarterly Review} (New York), \textbf{XXVIII}, 1873, p. 30.}
mortality figures for the nation as a whole were fragmentary and contained glaring discrepancies.

Crude as these records were, they nevertheless served to show an alarming increase in the death rate of American cities during the first half of the nineteenth century. In 1810 only one out of every 46.5 persons died annually in New York; by 1859 this had increased to one out of every 27 inhabitants.\textsuperscript{20} The mortality of Boston, New York, and other large American coastal cities had begun to exceed that of London by 1860.\textsuperscript{21}

Here was an unmistakable signpost pointing to the need for public health reform. This warning stirred into action a small group of men who believed that "vital statistics are the actual sanitary history of a community."\textsuperscript{22} In 1849 the Massachusetts Medical Society, with the support of the American Statistical Association, prevailed upon the state legislature to finance a committee of three to draw up a plan for a sanitary survey of Massa-


Lemuel Shattuck was appointed chairman of the committee.

Shattuck proved an excellent choice. He was well qualified to conduct such an investigation. His life had been one of diversified activity; in turn he had been teacher, historian, businessman, statistician, and finally a legislator in the state assembly. Although a layman in medical matters, he was a student of sanitary reform, his interest in this subject having been aroused when gathering and tabulating the vital statistics of Boston. Aided

American Medical Association Transactions, II, 1849, p. 487. The governor appointed Lemuel Shattuck, of Boston; Dr. Jeheil Abbott, of Westfield; and Nathaniel P. Banks, of Waltham, as the commissioners. Edward J. Jarvis, "Report of the Sanitary Commission of Massachusetts," Boston Medical and Surgical Journal (Boston), XLIV, 1851, p. 90. Contemporaneous with this survey, Daniel Drake was making a geomedical survey "to blue-print the geographical pathology of the Middle West at a time when sanitation, as we understand it, was unknown." For the influence of Drake's work on Billings and other future sanitarians, see Fielding H. Garrison, "Geomedicine: A Science in Gestation," Bulletin of the Institute of the History of Medicine (Baltimore), I, 1933, pp. 2-9, especially 4.

by the cooperation of medical men throughout the state, the committee finished its work quickly and submitted its findings to the legislature in 1850.25

This report is justly famous as the first concrete plan for an integrated state program of public health in the United States. Sensible in its suggestions, modern in its tone, it stands as a monument to the perspicacity of Lemuel Shattuck who was its sole author.26 By virtue of this document Shattuck fully deserves his place at the head of early American sanitarians.

In the 130 some pages devoted to planning the sanitary survey, the necessity for health reform was clearly set forth. Basing his opinion on the insanitary conditions prevailing throughout the state as reported by medical men, Shattuck estimated that nearly 50 per cent of all deaths were unnecessary, and that these fatalities resulted from environmental factors that society could amend or eliminate. The best solution for this high death rate was

25Report of a General Plan for the Promotion of Public and Personal Health, Devised, Prepared and Recommended by the Commissioners appointed under a Resolve of the Legislature of Massachusetts, relating to a Sanitary Survey of the State (Boston, 1850). The more important sections of this report are reprinted in Whipple, State Sanitation, I.

26All authorities are in agreement that the report was the handiwork of Shattuck alone. For a statement to this effect at the time the report was issued, see Edward Jarvis, "Report of Sanitary Commission," loc. cit., 90.
"prevention rather than cure." The physician, once disease had appeared, could only mitigate and alleviate the seriousness of the illness — cure depended mostly upon nature and the constitution of the person attacked. Shattuck, the layman in medicine, was not alone in his loss of faith in the physician's power to heal; the doctors themselves, in their more candid moments, voiced the same discouragement regarding the efficacy of curative medicine. Therefore, the constructive health proposals in this plan for state sanitation contained little of a medical nature, but instead stressed the desirability of changing the environment in which people lived.

Shattuck advanced an essentially simple and very practical method for administering his program. The state need only create a board of health with wide powers of supervision, and each community could then handle its own local sanitation problems under the direct supervision

27 Others beside Shattuck stressed the point that "prevention rather than cure" provided the best solution. [Clarke], "Sanitary Commission," loc. cit., 133-134. As an instance of the loss of faith in the effectiveness of medical treatment in those days, see the address by Oliver Wendell Holmes read before the Massachusetts Medical Society, May 30, 1860. The Complete Writings of Oliver Wendell Holmes (13 vols., Boston, 1892), IX, 173-208.

of this superior board. As an example of the modernity of
his suggestions, Shattuck advised that this work be put
into the hands of specially trained "sanitarians." He
also pointed out the advisability of employing full time,
well-paid local health officers, rather than depending up-
on voluntary help.

Instead of outlining in detail all the duties of
this state health board, Shattuck listed some fifty pur-
poses which could be served by state medicine, leaving to
the legislature the choice of which goals to pursue. Mat-
ters of water supply, sewage, ventilation, vital statistics,
standardization of causes of death in physicians' reports,
burial grounds, street cleaning, garbage disposal, drainage
of bogs and swampy ground, housing and plumbing require-
ments, and isolation of contagious cases made up the greater
portion of these suggestions. It speaks well of the
foresight of Shattuck that all his suggested reforms, prac-
tically without exception, became incorporated into future
health programs at one time or another. But is it fair to
say, by the same reasoning, that it reflects disparagingly
upon his fellow citizens that the plan was not adopted?

29 Shattuck also advocated the founding of sanitary
professorships in our colleges, for "the science of pre-
serving health and preventing diseases should be taught as
one of the most important sciences." Report of the Massa-
chusetts Sanitary Commission, 229.
Why did the report, as it were, drop "stillborn from the State Printer's hands"?  

Certainly it cannot be asserted that Shattuck neglected in his report to advance cogent arguments for the adoption of his program. He appended a list of well-argued reasons for adopting the plan, and a section devoted to answering expected objections to his proposals. He took particular pains to emphasize the economic advantages to be gained from improved sanitation, realizing that here lay the strongest resistance his plan would have to face. He also displayed concern lest the program arouse the opposition of the medical fraternity, especially certain selfish elements who would object because of mercenary considerations. It was pointed out that state medicine would help the physician "by giving him exact knowledge of the causes and prevalence of disease" upon which "he might construct a much better theory of medicine."

But primarily Shattuck stressed the wisdom of eliminating the causes of the diseases of society as "the greatest and

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30 Henry I. Bowditch, Public Hygiene in America: Being the Centennial Discourse delivered before the International Medical Congress, Philadelphia, September, 1876 (Boston, 1877), 31.


32 Ibid., 254-262.
the most important objects of philanthropy and charity," and he subscribed to the belief, as first expressed by the famous English sanitarian, Sir John Simon, that sanitary science, "in its beneficent operation, seems to embody the spirit and to fulfill the intentions of practical Christianity." Unfortunately, while "the history of the health of the people should be regarded as the most important part of history," it has usually been considered "an incidental matter of little consequence."33 It was Shattuck's hope that such indifference would now become a thing of the past.

That hope did not materialize. The public evinced no signs of shaking off its habitual apathy toward health reform. Another twenty years was to pass before a state health program modeled after the Shattuck plan found acceptance in Massachusetts.

The explanation for the failure of the 1850 report lies in several directions. Admitting the worth and reasonableness of the plan, the public of that day should not be blamed too severely for their continued indifference, for "the first and greatest need of any reform movement is to spread knowledge of the evils it is desired to cure."34 This had not been done. Knowledge of the living

33Ibid., 253, 266, 12, 81, respectively.
conditions of the poorer classes is what very few people possessed at that time, and the report of 1850 did not give them this information. It did not shock them into awareness of the grave social evil in their midst, as had its earlier English counterparts. Chadwick enlisted the compassion of the English people by presenting actual case studies and specific evidence on the debasing surroundings and homes forced on the poor by a new, emerging industrial civilization. In contrast, the Shattuck report appealed to the mind rather than to the emotions.

Nor did the periodical literature of the day abound in articles on slum conditions in American cities.35 Other reforms held the center of the stage. An imposing array of public questions — slavery, temperance, women's rights, prison reform, treatment of the insane, cruelty to animals — monopolized the nation's interest. There was little room left in such a crowded forum for sanitary reform, even though it be, according to the North American Review, one of the most important reforms of the century.36

Furthermore, if the restrictive economic measures necessary for carrying out health reform is kept in mind,

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35American periodicals, while printing occasional articles touching on this subject, did not feature the insanitary conditions of their cities as did the English.

36[Clarke], "Sanitary Commission," loc. cit., 118.
this public apathy becomes even more understandable. The recommendation "that tenements for the better accommodation of the poor, be erected in cities and villages" was certain to intrude upon the prized liberties and rights of the individual property holder. By emphasizing such environmental factors of sanitary reform it gave the average citizen a chance to protest: "This measure will interfere with private rights. If I own an estate hav'n't I a right to do with it as I please?" It is no surprise, therefore, that other reforms proved more popular. Temperance, women's rights, prison reform — there was nothing incommmodious about these movements, nothing that imposed restrictions on one's freedom to do with his property what he wished. But sanitary measures based on the belief that "filth" alone caused disease meant the destruction of highly profitable tenements and the embarrassment of large assessments to construct drains and sewers. For "filth" then, as today, paid good profits, and the human race being what it is, profits usually triumph over principles. That is the main reason that housing reform has lagged behind other humanitarian efforts. Furthermore, Shattuck's day was still the day when moral and religious judgments seemed of first importance, when man's soul came before his physi-

In 1850 the shadow of the slavery controversy lay over the whole nation. Men's minds were becoming absorbed by a sectional dispute which had risen to threaten the union. A state program concerning sanitary reform could expect to receive but imperfect consideration when competing with the slavery issue. As a matter of fact, the plan never came before the legislature for debate. Yet public health reform in America, by the very nature of the government and its administrative machinery, had to pass through the crucible of local control before qualifying as a national question. It had to proceed from the smaller unit to the larger. England, with its compact territory and its centralized government, could cut the Gordian knot of sanitation reform at one stroke. Not so in the United States. When the Massachusetts survey dropped

38 Frank D. Watson, The Charity Organization Movement in the United States (New York, 1922), 77.

39 The slavery issue was possibly one reason why the degrading conditions of the working classes in America's cities were not attacked in the periodicals of the day. The southern supporters of slavery were only too anxious to seize upon any evidence that would bolster their argument that "wage slavery" was worse than actual bondage. As the dispute became more and more acrimonious, the North, naturally, was reluctant to expose conditions that would bear out this southern point of view.

40 Samuel W. Abbott, Past and Present Condition of Public Hygiene and Medicine in the United States (Boston, 1900), 11.
from sight, America had to wait until after the great na-
tional question of the nineteenth century was definitely
settled before another state program was devised and then
adopted.

And finally, a measure of responsibility for the
plan's quick demise must fall upon its author. Not that
Shattuck's sincerity, or his devotion to the cause of state
medicine, can ever be called into question. To arrest such
thoughts one has only to read his testament of faith in re-
spect to sanitation:

We believe that the conditions of perfect
health, either public or personal, are seldom or
never attained, though attainable; that the aver-
age length of life may be very much extended;
... that in every year within this Commonwealth,
thousands of lives are lost which might have been
saved; that tens of thousands of cases of sick-
ness occur, which might have been prevented; that
these preventable evils... impose upon the people
unnumbered and immeasurable calamities, pecuniary,
social, physical, mental, and moral, which might
be avoided; that means exist, within our reach,
for their mitigation or removal; ... and that
measures for prevention will effect infinitely
more, than remedies for the cure of disease....
What...can come up for consideration that shall
transcend [sanitation] in importance? When com-
pared together, all other matters this side the
grave dwindle into insignificance.41

Words were not enough, however. Deeds were also required.
Unhappily, Shattuck did not possess the temperament of a
Chadwick. He could not lead a prolonged crusade, nor could

he fight on and on with undaunted perseverance as the Englishman did. He lacked the inner fire which drove Chadwick to devote his life to studying slums and fevers, to inspecting drains and sewers.

One should not be harsh with Shattuck. He was not a young man, but on the threshold of old age. His first and last love had always been vital statistics; it was to this field of study that he again turned when his plan for state medicine did not reach fruition.

Thus, the report of 1850 accomplished nothing concrete. It failed despite public knowledge of the splendid results experienced in England under a similar plan, failed despite the ominous threat of cholera in 1850 which, by all the rules of public behavior in response to an epidemic, should have created popular support for the plan. Even in failure, however, the report was significant as an indication of a critical attitude toward existing health conditions, and of a new concern for the immediate public health problems of society.
Chapter II

THE NATIONAL SANITARY CONVENTIONS

In the short, crowded years between 1850 and the outbreak of the Civil War, America began to awake to the need and value of personal hygiene. How to achieve physical fitness became an ever-increasing popular topic of discussion, and one which the magazines of the day consistently exploited.¹

Unflattering descriptions of the American populace by foreign visitors had a great deal to do with this rising concern regarding physical fitness. It would not be too much to say that after 1830 no European traveller ever forgot to insert somewhere in his published comments on the United States a few disparaging remarks about the physical appearance of the people.² Americans, basking in their own self-approval, found it difficult at first to believe such harsh things about themselves; for a long

¹The American physiognomy as disparagingly compared to that of Europe started a sharp controversy which drew attention to the desirability and need of personal hygiene in America. See [D. A. Wasson], "The New World and the New Man," Atlantic Monthly (Boston), II, 1858, pp. 513-531, especially 521.

²For typical criticisms see Allan Nevins, American Social History as Recorded by British Travellers (New York, 1923), 250-251, 279-280, 289, 302, 312, et passim.
time they considered these unfriendly comments as based on spiteful envy, or at best, on an unreasoned prejudice. About 1850, however, the nation as a whole began to realize that something was wrong with the general condition of its health, that these unkind criticisms on the part of foreign observers had a basis in fact.

Critics at home soon began more and more to express alarm at the disgraceful prevalence of physical defects and blemishes among this new breed of men in the New World. A few caustic tongues put the blame on the softening and debilitating effects of modern civilization — a way of life which, they insisted, was solely to blame for the disturbing physical decline they saw about them. More thoughtful critics defended existing society, pointing out that civilization, rather than decreasing virility, offered increasing opportunities — as yet undeveloped, to be sure—

3 Perhaps the best statement of this viewpoint came from Ralph Waldo Emerson: "What a contrast between the well-clad, reading, writing, thinking American, with a watch, a pencil, and a bill of exchange in his pocket, and the naked New Zealander, whose property is a club, a spear, a mat, and the undivided twentieth part of a shed to sleep under! But compare the health of the two men, and you shall see that his aboriginal strength the white man has lost. If the Traveller tell us truly, strike the savage with a broad-axe, and in a day or two the flesh shall unite and heal as if you struck the blow into soft pitch; and the same blow shall send the white man to his grave." Quoted in [T. W. Higginson], "Barbarism and Civilization," Atlantic Monthly, VII, 1861, p. 52.
for improving the well-being of its members. All these voices, regardless of what factors they blamed for the physical shortcomings of the average American, were agreed that the health of the nation was sadly deficient when compared with that of other lands.

In the battle of words that followed no part of the American anatomy escaped censure. The Young America of the 1850's, according to Harper's Monthly, was "a pale pasty-faced, narrow-chested, spindle-shanked, dwarfed race." And at the foot of this unprepossessing race of men belonged the college graduates — poor creatures who by reason of too much studying and too little exercise possessed "unstrung and dilapidated systems." Perhaps the most universal symptom of this physical decay was the condition of America's teeth; one seldom talked to a den-

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5[Higginson], "Saints and Their Bodies," loc. cit., 586, 587.


tist, it was affirmed, who did not despair of the republic.\(^8\)

That these accusations were supported by factual evidence was proven when the War Department, in 1856, published its report on the recruits examined during the Mexican War. Not only did American volunteers weigh less than European or English recruits, but there were also nearly twice as many rejections of Americans for being "too slender, and not sufficiently robust," or for "malformed and contracted chests."\(^9\)

But the men of America were not the sole target of these jeremiads. The health of the average woman presented an even darker picture. "In this country," one anguished male lamented, "it is scarcely an exaggeration to say that every man grows to maturity surrounded by a circle of invalid relatives, that he later finds himself the husband of an invalid wife and the parent of invalid daughters, and that he comes at last to regard invalidism ... the normal condition of that sex — as if Almighty God did not

\(^8\)[Higginson], "Barbarism and Civilization," loc. cit., 56.

know how to create a woman. This of course, the writer concluded, spreads a gloom over life. The fact that in all the vast female acquaintance of the Beecher family there were not a dozen healthy women bears out the fairness of the above accusation. One of the more momentous health problems of the day, it quickly became recognized, was to secure for American women the proper physical advantages of civilization.

Most alarming of all, certainly, was the chronic sickliness of American youngsters. The physical deficiencies of the nation were more clearly marked among children than any other group. A teacher in Canada in 1850, for instance, could readily tell which children in the school were born in the United States "by their invariable appearance of ill-health joined with intellectual precocity." As late as 1866 Harper's Weekly was still inveighing against a school system which stunted the bodies of children at the same time it overtaxed their minds.

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10[Higginson], "Barbarism and Civilization," loc. cit., 60.
12[Higginson], "Saints and Their Bodies," loc. cit., 586.
What was America to do? An almost unanimous answer to this question was found not in public health measures but in encouraging the practice of personal hygiene. Here agreement stopped and discord began. The subject of physical fitness provided a spacious rostrum from which every type of health theory or fad could contest for public favor.  

In the main, the necessity of more exercise and suitable outdoor pastimes was emphasized as a means to remedy the nation's health problem. That health was possible to Americans ought not to be questioned, one advocate of physical culture solemnly assured his readers. The superior physical condition of the Canadian people, largely a result of their love of athletic sports and outdoor life, was often held up as an example of what could be done for American health through individual hygiene.  

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16 [Higginson], "Saints and Their Bodies," loc. cit., 586.
American, however abject his condition, worked too hard and played too little. What truly national sport do we have, tartly asked Harper’s Monthly, unless it be "that of heating ourselves into excitement, and cheering our animal spirits by the burning embers of a neighbor’s house." 17

By the end of the decade the campaign for greater participation in sports and exercises bore fruit. The introduction of the German Turner societies shortly after 1848 stimulated gymnastics, a form of physical culture that enjoyed a growing popularity throughout the 1850’s and 1860’s. 18 Gains were made on other fronts, and no wonder. From the pulpits ministers pleaded the cause of amusements and games; in the magazines writers celebrated the uses and urged the necessity of sports and outdoor recreations; and even the New York Tribune contributed its part by campaigning lustily for a reform in American cookery. In truth, America had become at last a nation of health-hunters — the want betrayed by the search. 19

17[Robert Tomes], "Are We a Happy People?" Harper's Monthly, XIV, 1857, p. 208. America's interest in sport did not develop fully until after the Civil War. Before that time very little attention was paid to sports in which the people in general could take part. Mott, American Magazines, II, 201.


From a public viewpoint this search failed to touch on the real health problem. Proceeding as it did along individualistic lines, whatever benefits resulted would not — could not, in fact — accrue to that class which most needed help. It is true that "where sport is pursued seriously, important conditions for personal hygiene are obtained"; one reason that England led in public health is because sport was an integral component of English education.20 But this touched only the well-to-do. In America in the 1850's rich children stood "twice the chance of life that is given the children of the poor,"21 and the very common notion "that the privations and discomforts of poverty are at least compensated by health" was becoming recognized as an evil fallacy.22 The poor were left to the mercy of popular nostrums and drugs, to the quacks who multiplied tenfold as the nation concentrated more and more attention on personal hygiene, or,


22 Letter of the Committee of the Massachusetts Medical Society to Lemuel Shattuck, December 10, 1849, in Report of the Massachusetts Sanitary Commission, 357.
perhaps more mercifully, to quick death in a disease-ridden environment.

To turn this popular enthusiasm for health into channels of sanitary reform should have been the duty of the medical profession. Public health, although a movement in which the layman could helpfully participate, is nevertheless a medical problem and depends primarily upon medical advice for effectiveness. Unfortunately the prestige of medicine in the 1850's was at a low ebb, and the ranks of the profession were disorganized. The doctors were victims of their own want of knowledge, of the absence of adequate medical standards, and of a chaotic educational system. Many of their number, by promising too much to their patients, had brought discredit on the entire profession. Leading physicians were only too aware of the low state to which the profession had sunk. As Oliver Wendell Holmes so graphically put it, "if the whole materia medica, as now used, could be sunk to the bottom of the sea, it would be all the better for mankind, — and all the worse for the

Medicine first had to put its own house in order; not until this was done was it in a position to assume leadership of a comprehensive public health program.

The American Medical Association, to be sure, when first organized had appointed a committee on public hygiene and had indeed worked hard to further the Shattuck proposals in Massachusetts. But as soon as this plan failed the Association seemed to lose all interest in public health reform; the Committee on Public Hygiene submitted annual reports the first four years after the organization was founded (1847), a further brief report on sanitary police in 1856, after that came silence.  

Not until 1858 did the medical profession as a whole once more turn clinical eyes on the internal sanitary problem of the nation. This renewed attention to public health came principally through the efforts of Dr. Wilson Jewell, a member of Philadelphia's Board of Health.  

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24 Holmes, Writings, IX, 203. The medical profession in general protested against the extravagance of Holmes' language. See Boston Medical and Surgical Journal, LXI, 1860, pp. 513-514.


26 Jewell (1800-1867) was born in Philadelphia and graduated from the University of Pennsylvania medical college in 1824. He spent four years as medical officer on a packet ship, then returned home. He became active in the
quarantine laws of the time were in chaotic condition, for each seaport devised its own code, based on the prevailing whim or prejudice of its leading physicians. Jewell recognized the desirability and advantages of uniform quarantine regulations throughout the entire nation. As early as 1851 he advocated that a sanitary convention be called to investigate conflicting theories, adjust discrepant facts, and clear away the rubbish of error, superstition, and prejudice which was behind many quarantine rules.

When Jewell first broached his plan to several medical friends he received nothing but discouragement. Without exception they advised him that the reform he proposed was too difficult an undertaking to meet with success. The accomplishments of the European sanitary conventions in Paris in 1851 and 1852 convinced Jewell, however, that the task of reforming quarantine practices in America was not

Philadelphia County Medical Society soon afterwards. Early in his career he began to devote his attention to the vital statistics of his city, and helped frame legislation for the registration of births, marriages, and deaths. Jewell was president of his city's board of health. Tall and portly, he was a man of positive opinions. He possessed a strong sense of duty and an indomitable perseverance. Howard A. Kelly and Walter L. Burrrage, eds., Dictionary of American Medical Biography; Lives of Eminent Physicians of the United States and Canada, From the Earliest Times (New York, 1928), 662.

27Proceedings and Debates of the Third National Quarantine and Sanitary Convention, Held in the City of New York, April 27th, 28th, 29th, and 30th, 1859 (New York, 1859), 4.
impossible if a meeting of health officials could be ar-
ranged. He finally interested the New York Board of Health
in his proposals, and this body in 1856 issued invitations
to the Boards of Health, the Boards of Trade, and the Medi-
cal Societies of the Atlantic seaboard cities to assemble
in convention at Philadelphia on May 13, 1857.28

Seventy-three delegates, representing some twenty-
three organizations from nine states, composed this first
sanitary convention. The assembly, called primarily to con-
sider the quarantine regulations, soon decided to extend
the scope of its future activity to include internal hygi-
ene. The following year, when the convention met in Balti-
more, a Committee on the Sanitary Arrangements for Cities
was appointed for the express purpose of drawing up a code
of public health measures.29

Their report was placed before the Third National
Quarantine and Sanitary Convention, which convened at New
York on April 27, 1859. A substantial majority of the dele-
gates were medical men, and they selected for president of
the convention one of their number, Dr. John H. Griscom of
New York.30 The new president was a member of the recently

28 Ibid., 5.
29 Ibid., 86-87.
30 Griscom (1809-1874) was of Quaker ancestry. He at-
tended Rutgers medical college and the University of Penn-
sylvania medical school. He was appointed physician to the
organized Sanitary Association of New York, founded for the sole purpose of advancing public health regulations in New York City.

A pronounced shift in emphasis within the convention was immediately noticeable. Formerly quarantine matters had largely monopolized the deliberations. Now internal sanitary conditions held the spotlight. In his opening address Griscom stressed the fact that in the past twenty-five years his city had lost by preventable diseases more than 60,000 persons, while from yellow fever, which can be excluded by quarantine devices, a loss of less than 600 had been suffered in fifty years. These figures, in Griscom's estimation, correctly indicated the relative importance of the two divisions of hygiene which the convention had before it for consideration.31

New York Dispensary in 1834, and served as professor of chemistry in the New York College of Pharmacy from 1836 to 1838. In 1842 he was made City Inspector, then head of the health department. Before he was replaced for political reasons, he succeeded in passing an ordinance prohibiting the removal of the dead without permission of the City Inspector. This law, rigidly enforced, made mortality statistics for New York more reliable. Dr. Griscom issued annual pamphlets on the difficulties of sanitarians, published a report on "The Sanitary Condition of the Laboring Population of New York, with Suggestions for its Improvement," and championed the cause of the immigrant. He also invented a device for ventilating houses. An active, passionate sanitarian, he fought determinedly against politicians and the moneyed interests for control over the sanitary condition of New York City. Kelly and Burrage, eds., Dictionary of American Medical Biography, 501-502.

31 Proceedings of the Third Sanitary Convention, 17.
Fully half the proceedings of the four-day session was devoted to discussing a civic sanitary code that had been compiled by Dr. Henry G. Clark of Boston, a member of the Committee on the Sanitary Arrangements for Cities. Based mainly on the code drawn up by the Central Board of Health in England, it proposed methods for improving sewerage systems, water supplies, ventilation, and public parks, and for regulating and supervising house construction, markets, slaughterhouses, and interment of the dead. The state governments were petitioned to create state boards of health and to endow them with the authority to apply this code and to force its sanitary regulations upon recalcitrant communities.

During the years since 1850 a few cities — notably Boston, Providence, Philadelphia, and Baltimore — had put into practice many of the sanitary suggestions included in the code, and the result had been a slight decline in their death rates. In those particular cities, however, there had been no radical change in their sanitary laws;

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32 Clark was city physician for many years. A prominent citizen, his office was located at 18 Beacon Street for years, then at 35 Mt. Vernon Street. *Boston Directory, 1870 and 1876*; Justin Winsor, ed., *Memorial History of Boston, including Suffolk County, Massachusetts, 1630-1880* (4 vols., Boston, 1880), II, 548.

33 The proposed sanitary code is printed in full in *Proceedings of the Third Sanitary Convention*, 645-674.

34 Ibid., 106-108, 114, 123.
what health gains they could boast they owed to the efforts and persistence of outstanding individuals serving on their health boards. As an example of what a forceful, hard-working sanitarian could accomplish despite indifference and inadequate health laws, it is instructive to examine how one of those early health boards operated. At the Third Sanitary Convention in 1859 Dr. William M. Kemp of Baltimore described in detail the method used by the Baltimore health board to control the internal hygiene of that city.

Complete responsibility for the sanitary condition of Baltimore rested squarely on the shoulders of a three-man board of health, all of the members being physicians. Periodically these officials conducted a sanitary survey of the city. To aid them in this task the mayor placed a number of policemen at their disposal. When one of these special policemen noticed a condition of uncleanliness or any hazard to health upon a premise he filed a

35 Kemp was born on February 21, 1811, in Frederick County, Maryland. He graduated from the University of Pennsylvania medical college in 1834, and settled in Baltimore. He was president of the board of health from 1855 to 1861. During the yellow fever epidemic of 1855 Dr. Kemp, who was convinced that the disease was non-contagious, dispensed with all quarantine regulations for the city. Although bitterly criticized at the moment, the outcome fully justified his stand. He was appointed president of the second sanitary convention, which met in Baltimore in 1858. William S. Atkinson, ed., A Biographical Dictionary of Contemporary American Physicians and Surgeons (Philadelphia, 1880), 295-296.
report with the board of health, which in its turn investigated further. If the charges were borne out, the offending householder or landlord was commanded to remedy the objectionable condition at once. To enforce its dictates, the board was empowered by the municipal authorities to levy fines if its orders were not carried out promptly. If a citizen proved stubborn and continued to tolerate unsanitary conditions on his premises, the board could correct the abuses itself and charge the expense to the property owner. Without exception, in Kemp's experience, the mayor had always supported the rulings of the board when any individual had complained to the city government. Also, when the city was threatened by an epidemic, the mayor had turned to the board of health and given it a free hand in installing any health measures it deemed necessary to protect the city.36

Such a loosely organized health system could only work effectively when the utmost trust and confidence existed between the board of health and the political leaders of the city. Although this cooperation had been forthcoming in Baltimore, and one or two other cities, it could not

36 Proceedings of the Third Sanitary Convention, 114-120.
be expected to occur often. A more formal relationship was needed; this fact the convention readily recognized. The tone of the debate on the proposed sanitary code, mainly for this reason, was extremely favorable to it, and as the four-day meeting came to an end the assembled delegates gave almost unanimous approval to the code.

The convention of 1859 closed on a note of optimism. The day of widespread sanitary reform was not far off, the president said in his final address. He urged those who were vitally concerned with sanitary improvement to strike hard now, for once the people were awakened to the importance of public health and were moved to demand reform, "their servants, the legislature, will—they must—then grant it."39

Numerous developments of that time seemed to support this spirit of optimism. A health bill, prepared by

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37 An example of how easily a political machine could block health reform was taking place in New York City at that very moment. Leslie's Weekly had begun a campaign in 1857 against swill milk from diseased cows. Despite two years of rising public indignation, political leaders of the city, through their control of the board of health and other agencies, had prevented any legislation to correct this indisputable, acknowledged evil. Mott, American Magazines, II, 456-458.


39 Ibid., 240.
the New York Sanitary Association, was at that very moment being seriously considered by the state legislature, and it had strong backing from many quarters. Several minor laws aimed at correcting social abuses, thus indirectly furthering public health, had already been passed in some states and cities: for instance, the pure milk law of Massachusetts (1856); the appointment of milk inspectors in Boston (1859) and the collection of milk samples for examination; the first pediatrics hospital in Philadelphia (1855) and one in New York two years later; the first day nursery (1858); and the campaign against milk from diseased cows in New York (1857-1859).

Fully as significant as these practical accomplishments was the increasing sympathy being displayed toward sanitary science. The fourth annual meeting of the National Quarantine and Sanitary Society, held in Boston on June 14, 1860, extended its sanitary research into areas formerly untouched. Plans to continue the Committee on Civic Cleanliness, which presented an admirable report to the society on drainage, paving, water supplies, and sewerage, and the Committee on Tenements were approved. Additional committees were appointed to investigate the affect.

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on health of the working hours of labor and to devise a plan of mapping the physical geography of cities for statistical and sanitary purposes. The American Medical Association at its annual meeting in May, 1859, at Louisville, Kentucky, had appointed a committee to report on the influence of drainage and sewerage of large cities on public health, a work which the committee members prosecuted with vigor and enterprise. Other hygienic subjects were also placed on the schedule of business for future meetings. In New York the American Medical Times, a new medical journal under the editorship of Dr. Stephen Smith, with Drs. Elisha Harris and George F. Shrady as associate editors, fought strenuously and continuously for the reform of the health department of New York City. Bostonians in 1860 were offered a series of popular lectures on Sanitary Science by E. Y.

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43 American Medical Association Transactions, XII, 1859, pp. 32-33; see also Boston Medical and Surgical Journal, LXII, 27.

44 Nearly every issue of the American Medical Times contained some comment on sanitary reform. In its first editorial in 1860, the new journal announced that in the "department of Hygiene and State Medicine, it is designed to discuss practical questions and record the evidences of scientific progress in those important applications of our art.... Especially will Hygiene and every question relating to human health and public salubrity receive our most vigilant and faithful attention." Ibid., I, 1860, pp. 14-15.
Robbins, and the following year the Boston Sanitary Association held its first meeting, at which Dr. Edward Jarvis, one of its founders, emphasized that cities without proper sanitary protection were often three times as unhealthy as rural districts.45 A few weeks later the Massachusetts Medical Society supported the Boston Sanitary Association in its petition to the legislature for the establishment of a state board of health.46 The newspapers of the day were not far behind the medical journals in advocating health reforms in the larger cities. More and more attention was being devoted to sanitary matters by the layman as well as the doctor.

But the high hopes of the Sanitary Convention had to be held in abeyance while four tragic years in the history of the nation exacted their toll of anguish and suffering. Yet the health movement was not completely interrupted by this internecine struggle, for the health problems that the large volunteer armies created gave the advocates of sanitation a chance to substantiate their claims. Even more to the point, and of much greater importance to the future success of public health, the war and its sanitary problems awakened in the great mass of people a larger appreciation of the purposes of sanitation and of the benefits to be derived from a proper control of hygienic affairs.

45Boston Medical and Surgical Journal, LXII, 1860, p. 86; ibid., LXIII, 1861, pp. 525-526.
46Ibid., LXIV, 1861, p. 57.
Chapter III

THE UNITED STATES SANITARY COMMISSION

It was America's good fortune that the Crimean War was fought five years before the Civil War began. Every sanitarian worthy of the name had studied the report of the British Sanitary Commission, and most doctors in America were familiar with the medical history of the campaign, for excerpts of it had been printed in the medical magazines of the day. Certainly all intelligent persons, whether members of the medical profession or laymen, had thrilled to the story of Florence Nightingale and her noble and inspiring work in the Crimea. Thus, when hostilities opened between the North and the South, America inherited the sanitary knowledge purchased at such sad cost in the Crimea. A determination to make good use of this knowledge soon found expression.1

Neither the North nor the South was prepared for the problems of military medicine that confronted them. The Union Army, even though it possessed a medical department already organized and functioning, proved itself no better able to take care of its sick and wounded than the

1[H. Martineau], "Health in the Camp," Atlantic Monthly, VIII, 1861, p. 571.
southern forces. A department geared to prescribe for an army of 12,000 and with but 115 doctors on its roster was helpless when called upon to serve a large volunteer army of nearly a million men.\(^2\) Also, the available medical equipment was totally inadequate; the largest field hospital of the medical department consisted of only forty cot beds and was stationed at one of the western outposts.\(^3\) To guard the health of the soldiers in addition to treating their ailments was out of the question with such limited equipment and personnel.\(^4\)

The situation demanded prompt action. But the medical needs of the volunteer army could not be met satisfactorily by merely expanding the personnel of the medical corps. American doctors were untrained in military surgery, and most works on this specialized subject had to be imported from Europe. Even then, much of the more valuable information from abroad was printed in documents "not available to Americans."\(^5\) Yet, when Lincoln called


\(^3\)William H. Reed, The Heroic Story of the United States Sanitary Commission (Boston, 1910), 5.


\(^5\)George W. Wilde, "Sanitary Science in the Camp," American Medical Times, III, 1861, p. 51. By 1863 several works on military surgery had been written by American
for 750,000 volunteers in June, 1861, it was estimated by the medical profession that 1,400 doctors would be needed by the army. Most of these would have to be recruited from among the new graduates and younger, inexperienced doctors, or from the failures and incompetents in the profession. Such ill-trained and incompetent doctors could do more harm than good unless supervised by experienced and vigilant overseers, and many suspected that army medical officers could not provide the enlightened, capable leadership required.

In this crisis the struggle for civil sanitary reform came to a temporary halt. The public health movement, however, did not merely stand still and mark time until the war was over. It is more accurate to say, instead, that public health was placed on a military footing. By its very nature military medicine is a form of state medicine. As such it offers opportunity for pre-

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6American Medical Times, III, 1861, p. 418.

7A tendency for the established physician to withdraw from "what was happening around him" was severely criticized by the American Medical Times. It advised that they take a more active interest in public affairs, and especially public health. See "The Physician as a Citizen," ibid., III, 1861, pp. 8-9.

8[Harris], "Sanitary Commission," loc. cit., 161, 163.
ventive medical work; therefore those sanitarians who had been fighting so determinedly for sanitary reform now centered their almost undivided attention on protecting the health of the large volunteer army. But they were not alone in this. Here was truly a national sanitary problem, one that traversed all village, city, or state boundaries and that touched directly the personal interests and emotions of every citizen. During the Civil War sanitarians for the first time could count on popular support of the health measures they sponsored. Indeed, the United States Sanitary Commission, the instrument through which these sanitarians achieved their aims, owed its creation and continued existence to widespread public concern for the health of the "citizen" army.

Immediately after the outbreak of war the people of both sides began to search for a way to be of service to their fighting forces. This was especially true of the women; all of them, the men soon discovered, were "almost wild" to become Florence Nightingales. In New York

9The work done in the South in this respect exacted fully as much generosity and sacrifice from its civilians as did that in the North. For details, see the statement of Dr. E. P. Turnipseed, of Columbia, South Carolina, in Henry I. Bowditch, Public Hygiene in America, 246-255. However, the superior resources of the North permitted more effective organization. In sanitary or health matters the more significant developments, especially from a public health viewpoint, belong to the North.

City, as early as April 29, 1861, a meeting was called by several prominent women to consider plans for gathering supplies and distributing them to the soldiers in the camps and on the battle-fields. Similar groups sprang up in Boston and other cities throughout the North. In communities of all sizes these relief or aid societies remained active and functioned efficiently during the four years of war, and newspapers often carried their appeals for funds.

Two forceful men, Reverend Henry W. Bellows and Dr. Elisha Harris, saw in this spontaneous and enthusiastic desire to be of service a means for forming a national

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12See for an example an appeal "by the New-York Soldiers' Relief Society (formed last January)" in New York Times, September 5, 1862, p. 5.

13Reverend Henry W. Bellows (1814-1882) was a Unitarian minister and a reformer by temperament. He was at his best when championing an unpopular cause. After the Civil War he devoted his talents to attacking the spoils system. Although conservative in feeling, he possessed radical ideas. D.A.B., II, 169.

14Dr. Elisha Harris (1824-1884) was a pioneer sanitarian who had been prominent in the National Quarantine and Sanitary Conventions of the 1850's. During the Civil War he designed a hospital car for the transportation of wounded which brought him European recognition. He remained prominent in public health work until his death. D.A.B., VIII, 307-308.
organization for preventive medical work in the army camps. From their knowledge of past wars they knew that a far greater death toll would be exacted by disease than by battle.\textsuperscript{15} Bellows, Harris, and two other physicians\textsuperscript{16} went to Washington to see what could be done to avoid a repetition of this sad story. Here the idea of an "official" sanitary commission as an adjunct of the army medical department outlined itself in their minds — especially after they had viewed the disorder that characterized the Surgeon General's office in Washington.\textsuperscript{17}

The purpose of the sanitary commission, as they envisaged it, would be purely preventive — mainly to educate inexperienced troops in proper hygiene and to supervise the living arrangements in the camps. It was believed that the advice of experienced sanitarians could be of estimable value in these matters, for a camp and a city are

\textsuperscript{15}"Until the Civil War not less than five soldiers usually died of disease for every one killed in battle." [J. G. Forman], Western Sanitary Commission: A Sketch of its Origin, History, Labors for the Sick and Wounded of the Western Armies, and Aid given to Freedmen and Union Refugees, with Incidents of Hospital Life (St. Louis, 1864), 4. For more detailed figures concerning past wars see [Edward Jarvis], "The Sanitary Condition of the Army," Atlantic Monthly, X, 1862, pp. 470-473. Cf. "Sickness and Death-Rates in the Army," American Medical Times, VII, 1863, pp. 171-173.

\textsuperscript{16}Drs. W. H. Van Buren and Jacob Harsen.

\textsuperscript{17}[Harris], "Sanitary Commission," loc. cit., 160-161.
not unlike. The ordinary camp had a density of about 85,000 persons to the square mile, as compared to London's 50,000 or Philadelphia's 45,000.\textsuperscript{18} Questions of drainage, water supplies, ventilation, diet, and the disposal of refuse and excreta in densely populated centers were matters with which the doctor-sanitarian was familiar, and on which he could guide the new surgeons being called to the colors.

These men wanted the government to empower the "sanitary commission" with real authority to carry on its work. The army medical department would not hear of this, so the United States Sanitary Commission was organized without any real power to enforce its recommendations. Later however, after it had proved its worth, the Commission was able to influence the selection of a new Surgeon General more in sympathy with its aims and purposes,\textsuperscript{19} and from then to the end of the war it enjoyed the close cooperation and respect of the army medical corps. Thus, although recognized and authorized as a private organization by the government, the Commission "never became directly


\textsuperscript{19}William A. Hammond, a member of the more progressive school of medicine and science, and a believer and practitioner of "hygiene more than of drugs." See [Cheever], "A Treatise on Hygiene," \textit{loc. cit.}, 506.
dependent upon it or responsible to it.\textsuperscript{20} The Sanitary Commission belonged to the people, who maintained it by their voluntary contributions.\textsuperscript{21}

At first the United States Sanitary Commission was ordered to confine its activities to inquiries con-


\textsuperscript{21}The United States Sanitary Commission was not alone in this work. The Western Sanitary Commission, organized along the same lines and recognized on an equal footing with the United States Sanitary Commission by the government, performed the same functions in the territory west of the Mississippi River. Other minor groups also worked side by side with these sanitary commissions.

The best works on the United States Sanitary Commission are the "semi-official" history by Charles J. Stille, entitled \textit{The History of the United States Sanitary Commission, Being the General Report of its Work during the War of the Rebellion} (Philadelphia, 1866); the short, laudatory account, Reed, \textit{Heroic Story of the Sanitary Commission}; the articles in the \textit{North American Review} by one of its founders, [Harris], "Sanitary Commission," \textit{loc. cit.}, 370-419, 513-594; and other current articles such as [Norton], "The Work of the Sanitary Commission," \textit{loc. cit.}, 142-155. For the story of the western division of the United States Sanitary Commission, the fullest account is that of J. S. Newberry, \textit{The U. S. Sanitary Commission in the Valley of the Mississippi, during the War of the Rebellion, 1861-1866} (Cleveland, 1871).

A detailed history of the Western Sanitary Commission is [Forman], \textit{The Western Sanitary Commission}; also valuable is the \textit{Final Report of the Western Sanitary Commission, from May 9th, 1864, to December 31st, 1865} (St. Louis, 1866). An excellent appraisal of the work of the less well-known Western Sanitary Commission is Roland G. Usher, "The Western Sanitary Commission," \textit{Proceedings of the Mississippi Valley Historical Association for the Year 1908-1909} (Cedar Rapids, Iowa), II, 218-234.
cerning the actual health conditions of the army — diet, quarters, and clothing — and to advise the medical department of correct remedies for any sanitary abuses discovered.\(^2\) Frederick Law Olmsted\(^23\) was made executive chairman of the Commission, and he immediately appointed sixty capable inspectors to report on the condition of camps, drains, tents, ventilation, bedding, cooking utensils, clothing, and the source and quality of the water supply. All of these inspectors condemned the existing sanitary arrangements, but because of the belief that the war would soon be over the recommendations of the Commission were ignored. Not until after the first battle of Bull Run did the North awake to the necessity for sanitary precautions in camps and on the battle-fields. During the first year of the war the Sanitary Commission found it necessary to expand its operations in other directions than the two authorized by the government. It began to assume the wartime duties that the Red Cross of today fulfills; in fact, the Sanitary Commission was the precursor and the parent of the American Red Cross.\(^24\)

\(^22\) Reed, **Heroic Story**, 6.

\(^23\) This is the same Frederick Law Olmsted (1822-1903) who was author of several travel books on the pre-war South. On resigning from the Sanitary Commission he took up his profession as landscape gardener once more.

\(^24\) Reed, **Heroic Story**, 27-29.
Of the medical results of the Commission's work or of the army medical department, there is no need to speak at length. American surgery took great strides forward in skill and techniques of operating. The medical records of the war were most complete and drew the admiration of European surgeons. Yet no great sanitary or medical principles that altered the basic assumptions of sanitary science were discovered. At the end of the war the sanitarian retained the same beliefs regarding the causes of disease as he had had at the beginning. Although the "germ" theory began to gain acceptance among a few doctors, the environment still was universally blamed for the presence of these disease-breeding animalcules. Sanitarians spoke of mysterious "malarial miasms," of shadowy defined "nephritic effluvia," and, especially during the Civil War, of "crowd poisoning." To them the most dangerous conditions to guard against were wet or swampy soil.


26 The reports of the army surgeons were printed by the government under the title, Medical and Surgical History of the War of the Rebellion (1861-63); prepared in accordance with Acts of Congress under the Direction of Surgeon General Joseph K. Barnes, United States Army (13 vols., Washington, 1870-1888). The medical volumes in this set were edited by J. J. Woodward; the surgical, by George A. Otis.

Whatever caused disease, it was visualized as lurking in the soil, waiting but a chance to spring at unsuspecting victims. As late as 1871, doctors were heatedly—and learnedly—discussing in the scientific press the deleterious effects on health of living in dwellings that had been built on sites still containing the rubble from former structures. In the main, what was offensive to man's senses was injurious to his health. Dirt, the ever-present dirt that can be seen with the naked eye, was proscribed. So strong was medical opinion on this point that many surgeons blamed all defects of character on dirt; as one sanitary inspector phrased it, "dirt at one end, and cowardice at the other." Most dangerous of all, however, was decaying vegetable matter and other refuse of noxious odor. The olfactory sense was thought to furnish the most reliable witness to the threatening presence of disease.


29 Frank H. Hamilton, "Our Surgeons upon the Field," American Medical Times, VI, 1863, pp. 133-134.


Oddly enough, taste appeared to be the one sense to which this general statement did not apply. Nostrums were valued in direct proportion to the degree of their unpalatableness. When the water from Croton aqueduct in August
Nor was medicine in any position to classify disease accurately; such exact classification had to wait until the advent of bacteriology and its allied sciences. The Civil War was still a time when physicians talked in generalities, when the Surgeon General could weightily denounce the habitual use of ice cold water as "calculated to injure the tone of the stomach, and to produce diphtheria." Yet some progress in sanitation had been made since the day of Chadwick and Shattuck. After 1854 and 1856, when Drs. John Snow and William Budd had shown that cholera and typhoid could be transmitted by means of a contaminated water supply, the importance of boiling all suspect water had become recognized, and surgeons in the Civil War were repeatedly urged in official communications to take such precautions. Also, emphasis on matters of diet and proper hospital facilities were steps in the right direction.

1859 took on a peculiar "flat, insipid flavor," a "mingled twang of old hay and forgotten oysters," several of the city's most eminent physicians were called in to pass judgment on the purity of the drinking supply. One of the examiners insisted that the taste, far from harming the water, imparted to it a quality beneficial to health. To this verdict the New York Times could only reply: "It is not every man to whom the flavor of mint in the famous julep of Virginia is immediately agreeable." Unfortunately, to some tastes, the Croton water soon "will cease to be so distressingly 'pure,' and will condescend once more to the weakness of the ordinary New-York palate." New York Times, August 29, 1859. Also, ibid., August 17, 18, 25, 1859.

31 [Cheever], "A Treatise on Hygiene," loc. cit., 494.
direction. Despite the fact that many of the sanitary ideas then prevailing were based on a false etiology of disease, the mortality record in the war tended to show that the Sanitary Commission and the program it inaugurated had saved thousands of lives. Only two soldiers died of disease for every one from wounds in battle. Appalling as these figures may seem, the proportion in former wars had been much more formidable. The rate of mortality also decreased as the struggle wore on — a result which Surgeon General Joseph K. Barnes attributed to the marked improvement in the "general condition of the service in all matters of sanitary precautions and police...."

32 When the first wounded and sick arrived in Washington after the first battle of Bull Run, no hospital facilities were available to take care of them. Churches, schools, and warehouses were pressed into service as make-shift hospitals until the government could construct military hospitals and convalescent homes. See Margaret Leech, Reveille in Washington, 1860-1865 (New York, 1941), 205-206. Surgeon General Hammond, a close student of hospital care, introduced many innovations in hospital construction. By 1863 the building program had succeeded so well that the army listed 182 general hospitals with 84,472 beds.

33 Out of 6,454,834 cases of sickness, 210,000 were fatal. The number killed in action was 93,969 out of 236,000 wounded. Lyman, "Some Aspects of Our Medical Service," loc. cit., 146; see also Medical and Surgical History of the War, Medical, I, xxx, xxxvii, and 641.

many of the sanitary measures of that time were needless and ineffectual judged in the light of present day knowledge did not thereby render the whole sanitary program valueless. A working theory, even if based on a wrong premise, is usually better than none at all, and the general belief in outward cleanliness as a sign of healthful surroundings did much to prevent disease from spreading as widely or as quickly as otherwise it might have done.

The training given the young surgeons in the Civil War greatly influenced the development of public health afterwards. Many of these doctors — Samuel W. Abbott, T. F. Wood, and John Shaw Billings — were destined to play a prominent role in the advance of public health measures. Others contributed on a smaller scale in the villages and towns they returned to after the war. The Shattuck plan of 1850 had been shattered on the rock of professional apathy and public indifference; by 1864 there were signs that the medical profession had learned the sanitary lessons taught by the war and was determined to apply them.

35William H. Welch, Public Health in Theory and Practice (New Haven, 1925), 5, 8.


37For instance, the American Journal of the Medical Sciences pointed out in 1864 how disease spread in public
The medical results of the sanitary program among the armed forces supported the contentions of sanitarians, and reenforced the public health movement in the years to follow. Equally as significant to the future of public health was the part played by civilians in aiding and financing the sanitary commissions. Never before had the nation seen such enthusiastic, generous or sustained sacrifices from the whole people; "the tide of benevolence rose ... and has gone on ... gaining volume and force, until it has reached such proportions as to command attention as one of the most novel and extraordinary features of the great struggle." More than 15,000 soldiers' aid societies flourished in hamlet and city, relief organizations canvassed every house and door for funds and supplies, and in the larger cities all over the country substantial sums were raised by means of "sanitary fairs." True, these fairs tended to become "social" events, and perhaps pandered to instincts other than compassion and charity, but the purpose for which they were held was never conveyances, factories, and streets, showing the influence of the Civil War. Ibid., n.s., XLVIII, 1864, p. 423.

38Our Daily Fair (Philadelphia), Wednesday, June 8, 1864, p. 1.

39Ibid., 2. Big fairs were held in New York, Boston, Philadelphia, Chicago, Brooklyn, Poughkeepsie, Cincinnati, Pittsburgh, Washington, Baltimore, Albany, and St. Louis.
allowed to fall into the background. Their importance to
the army gained official recognition; General William S.
Rosecrans participated actively in the Chicago Fair, while
the high spot of the Philadelphia Fair was the day-long
visit of President Lincoln and his family. 40

These methods of raising money proved very suc­
cessful. The St. Louis Fair turned over to the Sanitary
Commission more than a half million dollars, and the Phil­
eladelphia Fair showed a profit of nearly 2 million. 41 A
pamphlet listing the articles contributed by individuals
to the Chicago Fair for sale indicates how thoroughly the
people participated in these efforts; what few critics
there were of the fairs were silenced by such whole-heart­
ed support. 42

Smaller communities contributed just as gener­
cously. Soon after the first call for supplies in 1861 the
Sanitary Commission was buried under the goods that show­
ered down on it. The story of just how liberal and wide­
spread this response was is told by the final report of

40 The Press (Philadelphia), June 17, 1864, p. 2.
41 Our Daily Fair, June 21, 1864, p. 89; September 11,
1865, p. 100; Martha J. Lamb, History of the City of New
York: Its Origin, Rise and Progress (2 vols., New York,
1877), II, 777-778.
42 Catalogue of the Art Gallery of the Mississippi Val­
ley Sanitary Fair, 1864 (St. Louis, 1864); Our Daily Fair,
June 8, 1864, p. 7; also ibid., June 9, 1864, p. 11.
the Commission. More than fifteen million dollars worth of supplies was received and distributed by the United States Sanitary Commission — and this does not include the five million dollars of supplies contributed to the Western Sanitary Commission, or of donations to other charitable organizations. 43

All in all, this impressive record measures the interest of the public in the work of the sanitary commissions, and indirectly the growing esteem for sanitation in general. No one realized this better than the sanitarian of that day, who drew attention to "the wide extent to which the knowledge and principles of Hygiene have become popularized," and to "the lively interest of all intelligent men in civil as well as military life, in the facts and purposes of sanitary science and hygienic improvements." With the "vocabulary" of sanitation and the

43 Reed, Heroic Story, 10. Outright gifts of money were frequent and generous. In this respect the most liberal contributors were the gold states of the Far West — California, Nevada, and Oregon — which gave nearly $1,500,000 in cash. Ibid., 15. The list of cash subscriptions to the Philadelphia Sanitary Fair is impressive. Ten contributors gave $1,000 apiece; three $500; eight $250, and a great number of other persons smaller sums. The Press (Philadelphia), June 16, 1864, p. 3. Boston, strangely enough, in addition to the support given the United States Sanitary Commission donated generously to the war chest of the Western Sanitary Commission. [W. G. Eliot], "Loyal Work in Missouri." North American Review, XC VIII, 1864, p. 524. Distribution costs were low, being slightly less than 2 per cent for the Western Sanitary Commission. Usher, "Western Sanitary Commission," loc. cit., 231.
"elementary facts of hygiene" becoming familiar to every household, the fight for sanitary reform once the war was over indeed looked more promising. Of great help, also, would be the support of the women, who during the Civil War worked side by side with men in the hospitals and even on the battle-fields. As a contemporary acknowledged, "the days for the flattery of women, like the days of chivalry, have gone by." The part played by women in supplying necessities for the Sanitary Commission had won for her her true place in society. As such she could be counted on as an ally for public health reform.

But there were even other ways in which the sanitary commissions of the Civil War publicized their teachings, thereby creating opinion favorable to public health and sanitation. The soldiers both in camp and on the battle-field daily saw the sanitary commissions at work; and while it is undoubtedly true that many of the volunteers and draftees from well-to-do families had a tendency to become slovenly once from under the family roof, there were

44 "War and Hygiene." American Medical Times, VII, 1863, pp. 89-90.

45 [Norton], "Work of Sanitary Commission," loc. cit., 151. The careers of Dorothea Dix and Clara Barton in the Civil War are well known, to mention but two.

46 Fred A. Shannon, The Organization and Administration of the Union Army, 1861-1865 (2 vols., Cleveland, 1928), I, 167-170.
others from the poorer families or from the city slums who for the first time came into contact with sanitary practices. One of the original reasons for establishing the United States Sanitary Commission had been to educate the individual soldier in personal hygiene, and the Western Sanitary Commission "prepared and distributed gratuitously", a Treatise on the Preservation of the Health of the Soldier.\textsuperscript{47} Such influence cannot be accurately gauged, yet the prospects of public health reform were brightened by the fact that the returning soldier took with him a knowledge of hygienic principles and an appreciative respect of the accomplishments of the sanitary commissions.\textsuperscript{48}

Concentration upon the war phases of health work in this period did not mean that all efforts for civil health reform ceased. In New York a health bill for the metropolitan district was introduced into the state legislature each year, but with no success. Yet agitation for this reform showed no signs of becoming discouraged.\textsuperscript{49} It was in 1863 that a measure regulating the milk supply be-

\textsuperscript{47}Usher, "Western Sanitary Commission," loc. cit., 225.


\textsuperscript{49}The American Medical Times reported periodically on the status and prospects of this bill. Throughout the war it continued to advocate the necessity for civil health reform. Cf. American Medical Times, IV, 1862, pp. 98-99.
came law, and Boston in her turn instituted a similar re-
form.\textsuperscript{50} In other cities and towns throughout the nation
agitation for health reform did not disappear entirely,
and the threat of an epidemic usually led quickly to the
establishment of a health board and health control.\textsuperscript{51}

On the whole, however, the cities instigated few
or no improvements in sanitation, and in several respects
health conditions, due to the dislocations of war, worsen-
ed. The New York draft riots of 1863 can be partly at-
tributed to resentment against the city officials for their
indifference to increasing unsanitary conditions in the
city's slums.\textsuperscript{52} The influx of workers and soldiers into
Washington created new problems of sanitation and health
which were not dealt with promptly.\textsuperscript{53} There is little
need to speak of conditions in the South; there the war
brought on unmitigated distress from which the section did
not recover for decades. In all, the Civil War interfered

\textsuperscript{50}Ibid., 155-156; Mazzyck P. Ravenel, ed., \textit{A Half Cen-
tury of Public Health}, 285.

\textsuperscript{51}For an example see Helen Clapesattle, "Health and
Medicine in Rochester, 1855-1870," \textit{Minnesota History} (St.
Paul), XX, 1939, pp. 229-230.

\textsuperscript{52}Stephen Smith, \textit{The City That Was}, 99; \textit{American Medi-
cal Times}, VII, 1863, pp. 41-42.

\textsuperscript{53}Leech, \textit{Reveille in Washington}, 204 et passim; Ameri-
can Medical Times, VIII, 1864, pp. 199-200.
with the normal development of the public health movement in its natural theatre of operations, the city. To make up these losses became the goal of sanitarians when the war ended.

Although the war contributed little or nothing to the public health movement in concrete gains, it did lay the groundwork for the renaissance of sanitary progress that was to follow. Politically, the decision settled by the Civil War played its share in forwarding public health. Public health is state medicine, and as such it flourishes best under a strong government. By establishing the supremacy of the Federal Government the Civil War ultimately drew the states together and introduced greater coordination between them. Consequently, a health program inaugurated by one state was less likely to be jettisoned by the unrestrained acts or the negligence of another. Perhaps this strengthened governmental authority should be considered the most favorable factor to public health to result from the Civil War.
Aside from quarantine restrictions there were in the United States no legislative enactments regulating the sanitary condition of the country until past the middle of the nineteenth century.\(^1\) What few scattered health laws had been passed by the states usually pertained to smallpox, whose presence was seldom absent for long from any town or village. Sanitary organization, like social civilization, tends to proceed from the lesser to the greater; therefore, when the need and desire for health regulations grew strong, it was in the domain of municipalities that this demand for health laws first found expression.\(^2\)

Although early American cities possessed no systematized health codes, they did attempt in a crude fashion to control disease and, especially in epidemic seasons, to prevent it from gaining a foothold. These efforts generally consisted of establishing a board of health, with wide powers to rid the community of any "nuisance" harmful to health.

\(^1\)American Medical Association Transactions, I, 1848, p. 306.

\(^2\)Samuel W. Abbott, Past and Present Condition of Public Hygiene and Medicine in the United States, 9, 11.
The first of the larger cities to establish a board was New York, by an act of the state legislature in 1796. Other cities soon followed this lead: Baltimore in 1798; Boston and Salem in 1799; Alexandria, Virginia, and Charleston, South Carolina, in 1804 and 1815, respectively; Philadelphia and New Orleans in 1818, and in 1832, Providence, Rhode Island. By 1860 most larger communities had some administrative body for supervising sanitary conditions. Usually, however, the health measures of these boards were only enforced during epidemics, and allowed to lie dormant in the interim.


Ordinarily the board of health consisted of the mayor and his council. Under these circumstances a medical man or an expert sanitarian seldom became a member of the health board. Even when medical subordinates handled the administration of the rulings and decisions of the board, the aldermen were "slow to recognize their [own] incompetency" on health questions, and "quick to take offense at the advice tendered by their medical assistants." Since the council was a political body, health administration quickly sank to a political level, or was managed so irresponsibly that true sanitary precautions were left unattended. At times the situation became so bad that even the members of the board could not stir the proper officials to action — in 1827 Alderman William Duane of Philadelphia, "teazed" by his neighbors to have the city water pump on Sixth Street repaired, complained to Mayor Joseph Watson that repeated requests by him to both the city clerk and the municipal government "had met with no success."  


During times of epidemic anything and everything became a proper subject for the arbitrary rulings of these boards, provided such interference held out hope of checking the pestilence. In more normal times the boards were expected to confine their activities to three or four main fields: improper drainage, scanty water supplies, accumulation of filth, interment of the dead, and sometimes deficient ventilation. The many other civic arrangements that affected public health went unnoticed, although occasional studies by voluntary groups inveighed against some of the growing social abuses of the day. These private organizations, even so far back as the first years of the century, showed themselves more solicitous of health conditions than the regular constituted authorities. Thus, the Medical Repository (New York) on its own initiative sponsored and financed studies of the saloon problem in New York City, of the living conditions of the workingman, of the bawdy house situation, and of the water supplies of New York and Philadelphia. It was in this last named field of sanitation, water supplies, that American communities made the most substantial progress during the first half of the century.

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8American Medical Association Transactions, I, 1848, p. 307; Smillie, Public Health Administration, 12.

Slowly but steadily, public wells, then private wells, gave way to city reservoirs. In 1800 only sixteen towns, or about 2.8 per cent of the population, possessed public water supplies. Fifty years later this had increased to eighty-three communities and 10.6 per cent of the population, and gains became more rapid each succeeding decade.\textsuperscript{10} Perhaps the best known and most ambitious project of this nature was Croton Aqueduct, which enthusiastic admirers compared in its "magnificence" to the great aqueducts of antiquity. First proposed by DeWitt Clinton in 1832, it was completed in October 1842 at a cost of \$12,500,000. It could supply New York City with thirty-five million gallons of water daily over a forty-five mile carry.\textsuperscript{11} As late as the sixties, however, such large cities as Milwaukee and Providence had no water systems.\textsuperscript{12}

In the sanitary arrangements of cities, drainage is fully as important as water supplies — if not more so.

\textsuperscript{10} Abbott, Past and Present, 35-36.

\textsuperscript{11} William B. Lawrence, "Croton Aqueduct," Hunt's Merchants' Magazine, X, 1843, pp. 434-441. The early water supply systems in Baltimore and Boston used wooden pipes. For descriptions of these "hollow log" conduits, see William T. Howard, Public Health Administration and the Natural History of Disease in Baltimore, Maryland, 1797-1920 (Washington, 1924), 127; George C. Whipple, State Sanitation, I, 17-18.

\textsuperscript{12} Arthur C. Cole, The Irrepressible Conflict, 81.
Here progress lagged woefully. Massachusetts enacted laws of a general nature providing for "regulating drains and common shores [sewers]" as early as 1702 and 1709, and other states followed her example a little later, but more than general intent was needed to bring concrete results. Boston's twenty-five miles of sewers, most of them half-blocked with mud, proved no match for her sixty-five miles of streets. Philadelphia had about eleven miles of sewers, and Baltimore but a mile. In many cities open sewers still were being used, and it was not until the last half of the century that the glazed earthenware sewer pipe came into common use. The first integrated pre-designed sewerage system in America, based on the plans of E. S. Chesbrough, was installed at Chicago in 1855. In most essentials it copied the practices followed in England. Until late after 1850 many large cities assigned the task of street cleaning and refuse disposal to "roving" livestock.

Adequate sewerage facilities would have been dif-

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15 Howard, Public Health in Baltimore, 120.
16 Chesbrough's report of 1855 is reprinted in Engineering News (Chicago), II, 1875, pp. 42-43, 55-56, 79.
ficult to maintain in any event because of the phenomenal growth of American cities. The greater part of these new urban dwellers were poor immigrants; foreign-born made up approximately half the citizens of New York and Chicago.\(^\text{17}\) Soon complaints were voiced that these immigrants were "poor" not only in money but in other qualifications, that they "crowd the rats out of the vilest cellars, and run up majorities for ruffian aldermen."\(^\text{18}\) Cheap rail and ocean transportation permitted emigration agents to recruit from heretofore untapped pools of inferior humanity, and the diversion of Irish emigration from England to America after 1848 created in Boston and New York the same sanitary problems that had so troubled London and other English cities earlier in the century.\(^\text{19}\)

This new element in urban population reflected itself in the mortality rates, which were alarmingly high

\(^{17}\text{Adna F. Weber, Growth of Cities in the Nineteenth Century, 306.}\)

\(^{18}\text{Francis Bacon, "Civilization and Health," Journal of Social Science (New York), No. III, 1871, p. 70; see also for a later opinion of the change in the type of immigrants coming to this shore, Francis A. Walker, "Restriction of Immigration," Atlantic Monthly, LXXVII, 1896, p. 827.}\)

in the ports of entry of these immigrants.\textsuperscript{20} Already the pathological aspects of poverty in its relation to public health had been officially recognized in Detroit,\textsuperscript{21} and in 1853 the New York Association for Improving the Condition of the Poor emphasized similar conclusions after an examination of the living conditions of the laboring classes.\textsuperscript{22} Those twins, poverty and disease, could not fail to prosper in a community such as New York where, in 1860, nearly 20,000 persons lived underground in cellar dampness and darkness.\textsuperscript{23} Unfortunately, "those who lived in the worse hovels complained least."\textsuperscript{24} The responsibility for remedying such evils, therefore, rested with the leaders of society. Yet "men in authority" and "public officers" per-


\textsuperscript{23} "Sanitary Science," \textit{loc. cit.}, 249.

\textsuperscript{24} B. Leigh Hutchins, \textit{The Public Health Agitation, 1833-1848}, 103.
sisted in ignoring all reform recommendations.\textsuperscript{25}

The public health of New York presented a more pressing problem than that of any other American metropolis. Since 1844, when Dr. Griscom had resigned, the health department had been without a medical adviser, and the health wardens, whose duty it was to inspect and to remedy insanitary conditions in their districts, were political appointees and decidedly inferior persons. The city, however, did take some measures to relieve and comfort its sick poor. In 1791 a free dispensary had been set up, to treat and to prescribe for those unable to afford a doctor. Over the years this dispensary system had expanded to such an extent that by 1860 more than 134,000 cases were handled by the physicians employed at the five dispensaries in existence. About 30,000 of these treatments were administered at the patients' homes.\textsuperscript{26} It was these visiting physicians who, in reality, served as the actual "health wardens" of the city — "a corps of sani-


\textsuperscript{26}"New York Dispensaries," \textit{American Medical Times}, I, 1860, p. 284. The average cost per treatment was sixteen cents. \textit{Ibid}. It was estimated that one-half of all the sick receiving medical care were provided for under the dispensary or hospital systems. \textit{Ibid}., 368-369. Baltimore also had a dispensary system. \textit{Howard}, \textit{Public Health in Baltimore}, 19.
tary inspectors or searchers, and the only ones in New York. With no title and with no executive authority, their services at best could only be a stopgap.

As living conditions became more and more disordered in New York, the need for sanitary reform grew increasingly urgent. Since 1850 all matters relating to public health had been controlled by a "city inspector." This officer had authority to appoint, with the consent of the board of aldermen, all his subordinates. These appointments quickly became the property of Tammany Hall, just entering its most flourishing period of corruption.

Opposition to this inefficient and dangerous health administration coalesced in 1857 when the Academy of Medicine petitioned the state legislature regarding the sanitary needs of the city. A health bill was introduced, but met defeat at the hands of the political machine. The


28 Laws of the State of New-York, passed at the Seventy Second Session of the Legislature, 1849 (Troy, 1849), chap. 187, p. 282. There were three other government departments devoted to public health functions: the board of health, composed of the aldermen and mayor; the commissioners of health, composed of the mayor, recorder, city inspector, health commissioner, resident physician, and port health officer; and the resident physician. The latter two had little real power; the first of the three so much power that the mayor hesitated to call it together. Smith, City That Was, 166.
following year, however, the Academy again presented a me­
morial to the legislature. This time the state senate ap­
pointed a committee of five to make an investigation of
the health of New York City. Composed of business men and
headed by General Prosper W. Wetmore,\(^29\) the committee, in
its Report on the Sanitary Condition of New York (1859),
advocated the complete reorganization of the health depart­
ment. It proposed that physicians be placed on the board
of health, that a physician-superintendent be made chief
executive officer, and that sanitary inspectors should be
qualified practitioners. A health bill incorporating
these findings was defeated in 1859, despite the support
of the newly-formed New York Sanitary Commission and many
prominent business men.\(^30\)

The Sanitary Commission took up the cudgels in
good earnest in 1860, introducing into the legislature a
sweeping, comprehensive health bill. Strong support in
Albany made the prospect most hopeful. The friends of
reform had their hopes dashed when the political machine

\(^{29}\) General Prosper W. Wetmore was a prosperous mer­
chant of New York. His efforts for sanitary reform did
not go unappreciated. He fought for reform, commented
the American Medical Times, "with intelligence seldom
equalled by non-medical men. He has become the Chadwick
of our Metropolis." Ibid., I, 1860, p. 424.

\(^{30}\) American Medical Times, I, 1860, pp. 423-424.
once more blocked the passage of the bill. But the agitation for reform achieved one immediate result; alarmed by all this hue and cry the city inspector, a few months following, put forward a reorganization plan of his own. He proposed that the sanitary police of the city be built around the dispensary system, with the visiting doctors supplanting the present health wardens. He also advocated that a majority of the health board be required by law to be physicians. Nevertheless, as an unfriendly critic pointed out, the city inspector was to remain the executive head of the health department, and the present incumbent, in listing the personal qualifications for the office, obliquely drew a remarkably striking self-portrait.31

The Civil War temporarily postponed a showdown between the city inspector and an aroused citizenry. As the war progressed, sanitary conditions in the city grew more and more unendurable. The garbage and refuse on the thoroughfares became "deeper by several inches than at any other time," and the city inspector himself reported in the spring of 1863 that the streets were "in a more filthy condition than has heretofore been the case at this season," and that, because of this condition, the mortality had increased to "a point of fearful magnitude. 32

31 Ibid., III, 1861, p. 223.
32 Ibid., VI, 1863, p. 231.
In 1864, when the North discerned a favorable issue of the war approaching, sanitarians and their friends turned once more to the problem of civil health reform. The method of attack they chose was not new, but this time the preliminary preparations and strategy were more carefully planned. In the early sixties a group of civic-minded men had formed the New York Citizens' Association, primarily designed to wrest control of the municipal government from the hands of the political machine. Its aid and financial support were enlisted and plans for the forthcoming battle laid.

Two committees were appointed to manage the campaign — a council on hygiene and one on law. The latter came under the control of Dorman B. Eaton, while Dr. Stephen Smith took charge of the former.

From now on Smith played an increasingly prominent part in bringing sanitary reform to New York City. Smith had come to New York in 1850 upon graduating from Buffalo Medical College and interned for two years at

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33 Eaton (1823-1899), a graduate of Harvard Law School, was a crusader by instinct. After bringing the health reform to a successful conclusion, he gave up his private practice in 1870 to devote his life to two reforms: elimination of the spoils system and the reform of city government. He was known for his courage and perseverance, as well as for his brilliant legal mind. D.A.B., V, 607; also Smith, City That Was, 163-181.
Bellevue Hospital. While in charge of fever patients on Blackwell's Island he noticed that a great number of his sick came from one tenement house. A visit disclosed shocking living arrangements. When he tried to have these insanitary conditions remedied, he found that there were no health laws which could be applied to such situations. This experience crystallized in him an interest in health reform. Smith possessed a keen, disciplined mind that stood him in good stead as editor of the American Medical Times. He fought continuously, but not without flashes of humor, to shake the public out of its habitual apathy to this issue. 34

As a preliminary step in its campaign the Citizens' Association sent a committee to Albany in 1864 to urge the passage of a health bill then before the legislature. There was little chance of the bill being approved; it was opposed by both parties — by the Democrats because they thought it was aimed at their friends, and by the Republicans because they feared its sweeping powers. 35


35American Medical Times, VIII, 1864, p. 200.
The main purpose of these delegates of the Citizens' Association was to find out what obstacles stood in the way of success. They soon discovered that the real opposition to health legislation came from the department of the city inspector, a gentleman who had upwards of a million dollars at his disposal with which to influence the legislature. 36

At the hearings in 1864 the city inspector and his hirelings denied every charge made regarding the prevailing insanitary conditions of New York City. Without proof either way it was one man's word against another's. The Citizens' Association decided therefore to conduct a sanitary inspection of the city. Smith was placed in charge of the survey. In the meantime, the legal committee of the Association perfected a new, more drastic bill to be presented to the state assembly in 1865. When the hearings on this bill finally took place, the Association had a well-prepared case to submit to the lawmakers.

From the very first, beginning on February 13, 1865, and continuing to March 18, the hearings progressed favorably for the reform cause. 37 The health wardens of the city were called to testify and astonished the legis-

36 Smith, City That Was, 41-42.

37 For current reports of the activities of the Senate Investigating Committee, see New York Times, February 16, 18, 23, 27, 1865; March 6, 11, 13, 14, 16, 18, 1865.
lative committee by their incredible ignorance. When asked if they understood hygienics, "some were of the opinion that they had it bad in some quarters; some thought it did not prevail much; and one officer told the Committee that Hygienics was the bad smell that arose from stagnant wa-
ter." 38 Another defined the word as "mist rising from wet ground." 39 Not one of them had any medical training, few possessed even the average layman's knowledge of medicine, and most of them, before their appointments as health war-
dens, had followed such occupations as barkeepers, rum-
sellers, emigrant runners, or no trade at all. The uni-
versally low level of their intelligence finally so exas-
perated Andrew D. White, chairman of the legislative com-
mittee, that he bitingly declared the prerequisites for the office seemed to be that one be "a liquor dealer by profession or an Irishman by descent." 40 As for their knowledge of the districts that they were supposed to pa-
trol, many of them had never entered the streets where dis-
ese and insanitary conditions were most in need of super-
vision.


39 Smith, City That Was, 167.

At this hearing their denials were controverted by the testimony of the inspectors employed by Smith in his sanitary survey, all of them young physicians of worth. Many had served as visiting doctors for the dispensaries. Their detailed reports, based on the English type of survey, supplied damning evidence of the wretched condition of the city.41

The representatives of the Citizens' Association profited from English experience in other ways. When they presented their arguments for the bill before the investigating committee of the legislature, the task of defending its legal provisions was assigned to Eaton, who brilliantly built his case on English precedents. Smith then followed and spoke on the medical need for such an act. His speech had been carefully thought out. He dipped copiously into the findings of the Association's survey, and when his statements concerning living arrangements among the poor seemed so shockingly incredible as to surpass belief, he dramatically proved them with photographs.42

41 These reports were gathered into seventeen folio volumes by the Citizens' Association. Elisha Harris edited a 350 page summary that was published under the title, Report of the Council of Hygiene and Public Health of the Citizens' Association of New York upon the Sanitary Condition of the City (1865). This was reviewed in Nation, I, 1865, p. 250.

42 His speech was reported in full in the New York
Beginning with an outline of the procedure used in conducting the survey, he then painted a picture of the existing condition of New York's streets, courts, and alleys. In the sixth ward, Smith testified, the filth and garbage covered the roadbed "to the depth sometimes of two or three feet." Such filth consisted of "house-slops, refuse vegetables, decayed fruit, store and shop sweepings, ashes, dead animals, and ... human excrement." Even worse were the courts and alleys leading to the homes of the poor. Not unfrequently they were overflowed and submerged with liquid "corruption." In the fourth ward, for instance, more than 400 families had to wade through such disgusting deposits to reach their quarters. Generally these courts contained both cesspools and privies, the former invariably being defective, the latter totally inadequate to accommodate the tenement population. It seemed impossible to one inspector "for human beings to create or endure such vileness." 43

Times, March 16, 1865. It is reprinted in Smith, City That Was. The latter source will be used in order to facilitate the location of citations.

43 Smith, City That Was, 65, 67, 71, 74. The moral depravation produced by such wretched quarters was particularly emphasized, thus appealing to the religious element. Clergymen were enlisted to speak for the health bill, and a great number of them did. See New York Times, March 13, 1865, p. 8.
Yet half of New York's million inhabitants resided in tenements nearly as bad as those described, Smith estimated, and more than 18,000 lived in damp cellars. These "cave-dwellers," surrounded by "green mould" and pallid wretchedness, "manifest the same lethargic habits as animals, burrowing in the ground.... Here we never find sound health, while the constant sickness rate ranges from 75 to 90 per cent." Conditions of the tenement population above ground were just as shocking. In "Cat Alley" several families existed in small, windowless rooms, without bedstead or table; in "Ragpickers Row" fifty dogs and thirty cats added to the stench created by an "anasarcus" population of twenty-eight families; in "Gotham Court," "Rotten Row," "The Great Eastern," "Sebastopol," "Quality Row," "Bummer's Retreat," and other places of like descriptive titles, the inhabitants underwent a process of decay which they themselves named "tenant-house rot."[44]

Disease was rife in these sections. One notoriously filthy house on Mulberry Street, Smith stated, had no less than sixty deaths from typhus fever and 240 cases of illness. Disease did not respect boundaries, he pointed out. The tailoring work of many reputable firms came from houses infected with smallpox, a disclosure extremely

[44] Smith, City That Was, 88, 93-94, 97, 100.
disquieting to several members of the legislature who had just purchased new suits in these same shops. Also, physicians from other cities had traced the source of illness in their communities to hotels in New York City. Yet London had shown that a large city could protect its health and reduce its mortality rate, provided the proper agency for this purpose was set up and vested with the necessary powers. The remedy for New York's plight, concluded Smith, was an efficient health board.45

It was a stirring, forceful appeal. Its effect surpassed the expectations of the reform advocates. The New York Times printed Smith's remarks in full, and spoke of his speech a few days later as "one of the most shocking pieces of reading that has fallen under the eyes of any Christian community in our day."46 Nevertheless, although the investigating committee of the legislature reported the bill favorably, the city inspector secured a postponement of a vote, which enabled him to marshal his political power to defeat it.

This setback disappointed all and discouraged many. The Nation sadly announced that it had "no sanguine

45 Ibid., 110, 113, 140-143. One member of the Assembly who had just bought a suit immediately began to "itch" and told Smith that he was sure he had smallpox. Ibid., 156.

expectations" for the future of this "last and best at­
temp" at health reform,47 while the New York Times angri­
ly railed against the lack of "any active and hearty coop­
eration in the work of reform" on the part of the intelli­
gent classes of the community.48

But in the following year, now that the war was
over, the medical profession — and to some extent the
public — began to show enough interest in the measure to
strengthen greatly its chances. The threat of cholera at
this time, which had made its dread appearance in Europe,
insured the passage of the measure.49 The Metropolitan
Health Bill became law on February 26, 1866.50

The new law abolished all the existing health
departments of the city, including the office of city in­
pector, and authorized a new sanitary district, composed

47 "The Sanitary Condition of New York," Nation, I,
1865, p. 250.

48 "We cannot help ascribing the growth and general
indifference to local affairs, and the gradual rise of the
very worst class into local power, to the prolonged ab­
sorption of the best minds, and highest public characters,
in the Anti-Slavery struggle. . . . it is now over, and
we hope within the next four years to see the efforts of
press, and platform, and pulpit turn to reform." New York
Times, March 18, 1865, p. 6.

49 Smith, City That Was, 156-157.

50 Laws of the State of New York, passed at the Eighty­
Ninth Session of the Legislature, 1866 (2 vols., Albany,
1866), I, chap. 74, pp. 114-144.
of New York, Kings, Westchester, and Richmond counties, and the towns of Newton, Flushing, and Jamaica. 51 It created a board of health of nine persons—four sanitary commissioners appointed by the governor with consent of the state senate, three of whom had to be physicians; the health official of the port; and the four metropolitan police commissioners. All the powers of former health agencies pertaining to the protection of life and the prevention of disease were conferred on the new board.

The health board was authorized to appoint an "experienced physician" as sanitary superintendent, two assistant supervisors, and sanitary inspectors not to exceed fifteen in number, ten of whom must be physicians. These officials were required to submit weekly reports. In addition, the board was expected to collect such information as might be useful to the discharge of its duties and the promotion of health, and to publish this material, together with the city's vital statistics and an account of its activities for the year, in an annual report.

Furthermore, the board had authority to exact periodic reports from all public hospitals, schools, dis-

51 The new district was conterminous with the Metropolitan Police District, created a few years earlier. First Annual Report of the Metropolitan Board of Health, 1866 (Albany, 1867), 9.
pensaries, prisons, and similar public institutions; to provide facilities for gratuitous vaccination and disinfection; to give medical relief to the poor; to remove and isolate cases of contagious diseases; and to supervise theatres and places of amusement. A complaint book was to be placed in each precinct station for the use of citizens who wished to report any health "nuisance."

Most important of all, the law vested in the board wide quasi-judicial and summary powers for the abatement of nuisances. These provisions were the handiwork of Eaton, and were modeled after English examples. Thus, the board might issue warrants, compel witnesses, administer oaths, and settle any protested action at a hearing, but only after notice had been delivered to the interested party. It might also enact, change, amend, or annul all rules and regulations for the protection of health, with the stipulation that it first publish such ordinances before putting them into effect. It was given the power to enforce its own orders on drainage, sewerage, ventilation, and noxious trades, and to carry out its rulings over premises, buildings, vehicles, vessels, and infected articles and places. An amendment a few months later, and one in 1867, gave it even broader powers in matters of this kind.

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52 Smith, City That Was, 171.
During times of pestilence or peril to the public health, the board was clothed with extraordinary powers. It could take any steps "as it may in good faith declare the public safety and health to demand." To prevent the spread of disease the law demanded that mutual cooperation be made the rule between the board and the quarantine officials, and it asked for the same cooperative spirit between the board and the police for the enforcement of sanitary rules and orders.

The quasi-judicial feature of the new law immediately drew the fire of Tammany Hall, which brought suit to test its constitutionality. The Court of Appeals upheld this wide grant of power, a decision of great importance to future health legislation the country over, for the Metropolitan Health Law became the basis for similar health legislation elsewhere. By 1868 Dorman B. Eaton, counsel of the Metropolitan Board of Health, could say with satisfaction that "the authority and usefulness

53 Laws of New York, 1866, I, 131. However, any unusual expenditures required the written assent of the Governor and six members of the board.


55 Smith, City That Was, 157-158.
of the Board had become so generally recognized that, more and more, its action is acquiesced in. In 1870, when the municipal government of the city was reorganized, the control of the health board was turned back to the local authorities. However, the principle that the board of health be empowered to create ordinances, to execute them, and to sit in judgment on its own acts, was retained. By the end of the century this right had become firmly established.

The first test of the new board was the appearance of cholera in the city, a test that it met very successfully, thereby winning the confidence of the people. The members realized that the board must "do its work with a gentle, though firm hand," because however good its ultimate goal, such accomplishment "must be reached by slow approaches ... unless popular support...should be lost."

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Although the board did not move fast enough to satisfy all its friends, many of them accusing it of timidity, it did succeed in the next few years in cleaning up the streets, disinfecting the tenements, and moving the slaughterhouses to the outskirts of the city. With the aid of new legislation, it made some progress toward correcting the tenement house problem. It closed "more than half of all cellular lodging-houses," and restored their "three thousand wretched occupants" to more healthful quarters above ground. Such efforts as these cut the percentage of deaths in tenements from 53.46 in 1868 to 48.02 in 1870. From out of the state came handsome words of praise; this diminished mortality, "most marked in the wards which had previously been most filthy," testified amply to the effectiveness of the program inaugurated by the new board. What failures the board experienced were not its own fault.

The main responsibility rested with the corrupt city gov-


61 First Annual Report of the Massachusetts Board of Health, 1870 (Boston, 1870), 56.
The municipal reorganization of 1870 and the elimination of the Tweed gang a year later led to greater efficiency in safeguarding the public health. Altogether, the board's efforts in these early years resulted in a public opinion "solidly behind its health department" well into the next century.63

The following ten years saw remarkable strides in the establishment of municipal instruments for health protection, especially in the larger cities. Chicago founded its board of health in 1867; Boston in 1873.64 By the end of the decade scarcely a community existed that had not instituted local control over health affairs.

In this respect, the United States had lagged far behind England and some parts of Europe. It took an outstanding triumph — the sanitary reform of New York City — to focus the attention of the people on the need and value of sanitary precautions in their towns and cities. Once the movement began, it progressed rapidly. As the Nation watched this sanitary impulse grow, it felt

64 Toner, "Boards of Health in the United States," loc. cit., 502, 504.
that at last it could thankfully and proudly proclaim that the United States was advancing toward equality with Europe in philanthropic work.\textsuperscript{65} Within the growth of this municipal interest in sanitation lay the seed of still greater health reforms. Local control was necessary before the public health movement could advance at all; once this had been attained the attention of sanitarians could be turned to the next goal, the state governments.

\textsuperscript{65} "Philanthropy in America and in Europe," \textit{Nation}, IV, 1867, p. 310.
Chapter V

STATE BOARDS OF HEALTH

All public health regulations and laws are based on the "police power" of the state government.¹ In the domain of public health the state is supreme. That is why all pleas for health reform, whether the early ineffectual petitions of state medical societies or the more elaborate campaign of the New York Citizens' Association, were addressed to the state legislature. The adoption of the federal form of government by the United States, with the exception of certain specified grants, left the sovereignty of the state unimpaired. Despite increasing Federal participation in public health affairs in recent years final authority concerning public health measures still rests with the state government.

The police power is perhaps the most extensive of all governmental powers, embracing "everything essen-

¹Although the term "police-power" was apparently first coined by Chief Justice Marshall, and in the 1850's was used extensively by state courts to justify state regulation of corporations, its currency in legal terminology was not formally recognized until 1873. In that year it was defined in a footnote in Kent's Commentaries by the editor of the twelfth edition, Oliver W. Holmes, Jr. See Walter H. Hamilton and Carlton C. Rodee, "Police Power," in Encyclopedia of the Social Sciences (15 vols., New York, 1930-1935), XII, 191.
tial to the public safety, health, and morals. Its roots lie far back in common law, and in its modern dress it is a growth of the community right to abate public nuisances. Courts have customarily been willing to recognize any threat to health as a nuisance and a proper subject for regulation or restriction. As a result, any measure, reasonable in nature, that is aimed to nurture or protect the public health is today generally upheld by the courts. Since ultimate health authority is vested in the state government, sanitarians naturally deemed it extremely important that state health boards be established in each state.

This power of the state does not necessarily mean that it must be exercised by the state government only. It can be delegated to other corporations or agencies. In the case of New York City in 1866, the state transferred its right to regulate the public health to the Metropolitan Health Board, and it was a common practice

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4 Tobey, Public Health Law, 73.
when granting a charter to a village or town to delegate
to the local officials all control of community health
regulations.

But local supervision of public health left much
to be desired. For one thing, "the absence of prominent
special cause for interest" made these independent boards,
"with small exception, all inoperative." In addition to
the difficulty of depending on local communities to take
proper care of their own health affairs, there was the con­
stant danger of neighboring towns or villages spreading in­
fection despite the most rigorous and vigilant safeguards
by more progressive communities. One alarmed critic point­
ed out that two lovely suburban villages within a few miles
of New York City, yet outside the Metropolitan Health Dis­
trict, had death rates that equalled those of the worse
slums in the city. Throughout the early 1860's the Ameri­
can Medical Times stressed the futility of fighting disease
locally if other communities were permitted to harbor in­
fec tion at will. Local efforts needed a coordinating

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5 Azel Ames, Jr., "The Work of Local Boards of Health,"
Fifth Annual Report of the Massachusetts State Board of
Health, 1874, 451.

6 Francis Bacon, "Civilization and Health," Journal of
Social Science (New York), No. III, 1871, p. 72.

agency, otherwise these boards were "but guerillas and half-drilled militia, too often dissipating their strength and wasting their ammunition in misguided and even antagonistic movements."\(^8\)

The municipal boards of health were among the first to recognize this and to advocate the creation of a state board of health. But they also had other reasons. Alone they often did not feel strong enough "to stem abuses which ignorance, prejudice and self-interest have made too strong for them," but with the support of a state board they could more easily achieve many badly needed reforms.\(^9\)

Several other reasons for establishing a state board were advanced: the majority of citizens do not live in cities or villages; the need for draining swamp lands and for controlling the pollution of streams and rivers; the many little-known or dead-letter health laws which a state board could call to the attention of local authorities; and the desirability of instructing all citizens concerning hygienic principles. This last was considered one of the most important functions of a state board\(^10\)

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\(^9\)Ibid., 423.

just as it still is today. Coupled with all this was the need for some central administrative clearinghouse for health statistics, an essential prerequisite for any intelligent attack on disease conditions.\(^{11}\)

Sanitarians, therefore, did not rest content with the substantial gains they were making in bettering municipal sanitation. Ahead lay still more important citadels to capture, the state governments. Massachusetts was first to yield to the new attack.

It was most logical that Massachusetts should be the first state to establish a state board of health.\(^{12}\)


All state boards but four were immediately after their establishment given the task of collecting and tabulating vital statistics. This enabled the boards to keep their finger on the pulse of the state's health condition, and to detect any danger spots at once. Today, all state departments of health except that of Massachusetts supervise the collection of vital statistics. The retention of the Bureau of Vital Statistics under the Department of State in Massachusetts has been severely criticized. See Charles V. Chapin, A Report on State Public Health Work, based on a Survey of State Boards of Health (Chicago, c. 1915), 136-137; cf. James Wallace, State Health Departments of Massachusetts, Michigan, and Ohio, with a Summary of Activities and Accomplishments, 1927-1928 (New York, 1930), 36.

\(^{12}\)Louisiana created a New Orleans health board in 1855 with state-wide powers, but this was really only a quarantine body. Massachusetts was the first state to set up a board with those duties associated with the modern
Although local administration of health affairs had made more impressive progress in several large cities of other states, Massachusetts had always been in the front ranks of sanitary reform. The first known law in America dealing with public health was passed by the General Court of Massachusetts in 1647 or 1648, and throughout the following century occasional laws to restrict or abate objectionable nuisances were promulgated. A law of 1797 permitted any town so desirous to choose a health "committee" or appoint a health officer, with power to abate any public nuisance. These powers and duties were transferred to the city council by a general law of 1849.

While this record of health legislation does not suffer in comparison with that of other states, Massachusetts sanitarians were quick to criticize it. First among

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13 The first law was a quarantine measure taken against ships from the West Indies. It is printed in full in George C. Whipple, State Sanitation, I, 4-5.

14 Two further laws were passed in 1866 when the threat of cholera stirred the state legislature into action. The first permitted a person to appeal to the county commissioners when the town board of health neglected to issue orders to abate common nuisances, and the second allowed the local board of health to appoint agents to act for them in case of an emergency. See Susan Peabody, Historical Study, 55.
these critics was Lemuel Shattuck, who protested that not only were the state health laws in 1850 imperfect in their provisions, difficult to decipher, partial in their application, and incapable of enforcement by towns, but that even if they could be understood and enforced, they were "entirely inadequate to the present condition of society, and the present wants of the age." This became the almost unanimous viewpoint of those Massachusetts sanitarians who followed in his footsteps. There were many of them: to name but a few, Drs. Henry G. Clark, Edward Jarvis, George Derby, and last but not least, Henry I. Bowditch.

However severely Massachusetts' own sons might scold her, those in other commonwealths or states looked to her for leadership. Foremost in literature and learning, a stronghold of humanitarian sentiment, Massachusetts could be expected to take the pioneer steps in sanitary reform.15


16An instance of this intellectual and humanitarian leadership was the formation of the American Social Science Association in Boston, October 4, 1865. A regular Department of Health was established to study such questions as quarantine in relation to cholera, tenement housing, inspection of food and drugs, sewerage of great cities, management of hospitals and insane asylums, and, oddly, pork as an article of food. American Social Science Association, Document Published by the Association, with an Abridgement of the Transactions, Part I, 1865-6 (Boston, 1866), bound with volume one of the Journal of Social Science.
To her honor, the *American Medical Times* declared in 1861, this "flourishing Commonwealth" had set her "statutory seal upon the General Code of Health that was last year adopted and recommended by the National Sanitary Commission." During the Civil War this same New England state had been perhaps the most generous contributor to the sanitary commissions which had done such admirable work, and throughout the sixties the two monthly periodicals that displayed the greatest concern and interest in sanitary affairs, and that gave this subject the most space, were of Massachusetts origin.

In 1869 "a Thirty years' war" with the politicians was brought to a successful conclusion. A bill to create a state board of health passed the legislature and became law on June 21.

No bitter or sharp contest marked the passage of this bill, such as that over the Metropolitan Health Act in New York. To be sure, Edward Jarvis had introduced a memorial favoring a state board of health as far back as

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18 The *North American Review* and the *Atlantic Monthly*.

and Henry I. Bowditch had been active for years in agitating for such a board. But the public itself displayed little interest. When the health act was finally approved, it attracted little notice; even the principal organ of the medical profession in Massachusetts, the Boston Medical and Surgical Journal, failed to mention its passage. Not until the governor, nearly two months later, named the seven board members provided for in the law, did this medical magazine acknowledge in its columns the establishment of the new health board.

The state board was expected to function entirely in an advisory capacity to local health agencies. As originally conceived, and stated in the act creating it, the board was to "make sanitary investigations and inquiries in respect to the people, the causes of disease, and especially of epidemics and the sources of mortality and


Bowditch (1808-1892) was a forceful exponent of and writer on preventive medicine. His most important contributions to medical science were his studies of consumption. See Whipple, State Sanitation, I, 190-196; D.A.B., II, 492-494; Vincent Y. Bowditch, Life and Correspondence of Henry Ingersoll Bowditch (2 vols., Boston, 1902), especially volume two.

21 Even then it gave credit for the news item to the Boston Daily Advertiser. See Boston Medical and Surgical Journal, n.s., IV, 1869, p. 16.
the effects of localities, employments, condition and circumstances, on the public health." The members were to meet at least once every three months, and no one but the secretary was to receive compensation. It is interesting to observe that no qualifications as to medical training or experience were specified regarding those appointed to the board. Fortunately, the governor appointed three physicians to the first board. One of these, Bowditch, became chairman, while another, Dr. George Derby, was made secretary.

The task they so cheerfully assumed was not easy. These men were breaking new ground; as in all pioneering, they constantly had to devise procedures to meet the different situations that arose. In October, 1869, the new board issued its first communication to the existing health boards in the towns and villages of Massachusetts. "Local and private interests have often been so strong as to paralyze the action of the health authorities," it warned, and

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22 Acts and Resolves passed by the General Court of Massachusetts in the Year 1869 (Boston, 1869), chap. 420, p. 739. The act was short, containing but six sections and covering scarcely more than a page.

23 Derby (1819-1874) served with distinction in the Civil War, where his latent abilities came to light. Afterwards, he became city physician of Boston and professor of hygiene at Harvard College. He also edited the registration reports of Massachusetts. He died while actively serving as secretary of the state board of health.
then listed a number of health laws regarding public nuisances, milk supplies, drugs, meats, swamp lands in villages, and tenement and lodging regulations in Boston that could and should be enforced. However, when some local health officers appealed to it for a code of "health regulation," the secretary had to confess there was none. He then suggested that they work out such a code. The result of their efforts was printed in the annual report for 1873.

Not all the initial worries of the state board revolved around their health work. Advocates of the bill in the legislature had carried all parties with the slogan "health is always more Economical than disease." A year later, on this same score of economy, a faction in the legislature threatened to cut short the life of the board. Happily, the attempt did not succeed. Massachusetts was not alone at this time in possessing "an unhealthy public

24 W. L. Richardson, Summary of Seven Years' Work of the State Board of Health of Massachusetts (Boston, 1876), 8-9.


28 Boston Daily Advertiser, reprinted in Boston Medical and Surgical Journal, n.s., V, 1870, 283; see also 286.
sentiment toward expenditure of the public means in behalf of the sick poor; in Philadelphia in 1870 accusations of extravagance were being hurled at those in charge of the program of medical care. So far as Massachusetts was concerned it is difficult to understand how there could have been any budgetary grounds for eliminating the state board. Outside of the secretary's annual salary of $2,500, expenditures in the first three years of its existence averaged about $2,000. As the new administrative body settled down to its work, the results obtained far surpassed the monetary costs.

The members did not take their duties lightly, and although not paid for their services, worked hard at their new labors. They did not envisage the board as a "high court of judicature" to sift the evidence described by witnesses; instead, the board visited the nuisances complained of to judge with their own senses. That meant inspecting slaughterhouses and rendering plants, not a very pleasant task at the best and the board was seeing these places at their worst. On one occasion when the members boarded a streetcar after having examined a fertilizer plant they suddenly noticed their fellow passengers acquire

30 Richardson, Summary of Seven Years' Work, 42.
that "peculiar expression characteristic of people whose olfactory organs are offended." Considerably embarrassed, for they knew they were the cause, they immediately got off the car. But before they were out of earshot they heard one passenger ask, "Who are those men?", to which the conductor replied, with considerable emphasis and relish, "That's the State Board of Health, sir."

The new board waged its first campaign against the slaughterhouse nuisance, as the New York City health authorities had done. This offensive trade, if not the most dangerous nuisance to public health, was unquestionably the most noisome. The legislature seemed as eager as the health board to banish from its presence the revolting stench set up by these businesses. First it provided means for improving the butchering process in use; then, when that brought no results, empowered the board to issue a desist order if in the judgment of the board the public health or the public comfort was imperiled. The butchers showed little willingness to cooperate, especially in Brighton, where the slaughterhouse evil was most flagrant. When the courts finally upheld, in all important points, the charges of the board against these intractable firms, a six-year struggle was brought to a

successful conclusion.\textsuperscript{32}

Other special investigations and subjects received the board's immediate attention. The sale of poisons, the use of intoxicating liquors, and a study of tenement mortality were selected for study at the first meetings, and additional phases of what then was considered the proper sphere of sanitary work were soon added. "Very naturally the study of particular diseases and their prevalence received early attention, and curiously...some of the least common diseases were taken up first."\textsuperscript{33} There were papers on trichinosis and charbon in 1871 and 1879, foot and mouth disease in 1871, and cerebrospinal meningitis in 1874. Of the more common disease typhoid fever gained attention in 1871, consumption in 1873, scarlet fever and yellow fever were discussed in 1878, while articles on smallpox and vaccination were included in every report from 1871 to 1874. In its annual reports the board also published numerous studies of ventilation; water supplies, stream pollution, and sewerage; industrial conditions of the wage-earner; food poisoning and adulteration; and vital statistics and infant mortality.\textsuperscript{34}

\textsuperscript{32}Richardson, \textit{Summary of Seven Years' Work}, 11-16.

\textsuperscript{33}Whipple, \textit{State Sanitation}, I, 55.

\textsuperscript{34}Annual \textit{Reports of the Massachusetts State Board of Health, 1870-1879}. Other subjects considered during this
In obedience to the specific instructions of the law of 1869, the board issued circulars for the benefit of local health officers, and published weekly and monthly summaries of vital statistics. Bowditch, in his opening address to his fellow members in 1869, had emphasized the diffusion of health and sanitary knowledge among the people as the primary duty of the new agency. He suggested that this could best be accomplished by holding meetings throughout the state to discuss the subject, and by having the secretary, members of the board, and other able physicians give health lectures. The publication of articles on hygiene in periodicals and the annual reports authorized by the legislature could also contribute to this end.

The local boards of health were the best channel through which to reach the general public and to instill in it an appreciation of sanitary rules. Most of the twenty ten-year period were treatment of the insane and mental diseases, house drainage, cremation and burial, one-story hospitals, color blindness, and the construction and sanitation of schools.

Secretary George Derby compiled these vital statistics. He was experienced in this work, for he had been in charge of collecting the vital statistics of Boston before assuming his duties on the health board. These summaries were faithfully printed in the Boston Medical and Surgical Journal and other publications.

large cities in Massachusetts already had established such boards, but the smaller towns presented a different and more difficult problem. Here the prominent physicians were asked to fill out questionnaires regarding health conditions in their districts, and to submit periodical reports to the board. By these means the state board by 1874 had succeeded to some extent in awakening in the communities of the State an increased regard for the right and duty of every district, town, and neighborhood...to protect the interests of life and health. Yet much remained to be done. In this same year the secretary of the board reported that he had mailed a circular to the correspondents of the board in an effort to bring local and state health officials closer together. Of the 154 replies, half were from selectmen who spoke of everything but those matters pertaining to health, and of the remaining answers, the majority so freely criticized the local boards that their remarks did not bear repeating. These local boards, the secretary lamented, have no idea of the responsibility which belongs to their office. And at the end of ten

38 Ibid., 211.
39 Ibid., 238.
years of constant effort to educate the people, the board had to confess that it had "as yet hardly been able to more than prepare the community to see the necessity of concerted action to prevent disease...."40

This tenth year was the last for this original board. In 1879 it was merged into the Board of Health, Lunacy, and Charity. The change was made under the masquerade of a "supposed popular clamor for retrenchment"; in reality, the health board as a separate body was abolished for political reasons.41 The Boston Medical and Surgical Journal deplored the destruction of an agency that had accomplished such valuable work and that had been an influence for improved sanitary legislation the country over. However, it advised the board not to enter the "arena of politics" in order to save its life, for in doing so it ran the risk of "bringing sanitary science into disrepute." Better the board be abolished outright, the magazine asserted, "for another would soon be demanded by the State."42

40 From the Tenth Annual Report of the Massachusetts State Board of Health, quoted in Whipple, State Sanitation, I, 60.
41 Boston Medical and Surgical Journal, C, 1879, pp. 334, 551.
42 Ibid., 334.
This prophecy was borne out in 1886, when a separate board once again was established to take care of health affairs. The reorganized board was given enlarged powers and duties, and it sponsored a series of sewerage experiments and water supply studies that won world acclaim.\textsuperscript{43} In this field Massachusetts regained the leadership that she had sacrificed on the altar of campaign politics in 1879.

All in all, the ten-year period from 1869 to 1879 of the original board must be credited with greatly advancing the cause of sanitary science. By the example she set, Massachusetts served not only herself but the whole nation. In 1874 Bowditch observed with gratification that "our example has stimulated" several other states to "a like course of action in regard to Prevention or State Medicine....\textsuperscript{44} By that year six states — Massachusetts, California, Virginia, Minnesota, Michigan, and Maryland — had created state boards of health; Louisiana (in 1870) had reorganized an earlier, ineffectual board; and two other states were in process of establishing boards. Eighteen new boards made an appearance between 1870 and 1880, and

\textsuperscript{43}Whipple, \textit{State Sanitation,} I, 76-87.

ten more in the following decade.45

An examination of the statutes creating these boards testifies to the widespread influence that Massachusetts had in promoting the movement. The California law followed that of Massachusetts nearly section for section and word for word, and the second section of the Massachusetts act, in which the duties of the health board were outlined, kept reoccurring in each new state health bill. However, many states added provisions requiring the health boards to collect the vital statistics of the state, a duty that in Massachusetts had been and still is handled by the Department of State. Otherwise the early boards differed only in minor degree from the model set up in Massachusetts.46

By 1872 state medicine had advanced to a point where it was possible to found the American Public Health Association. Two years later this organization felt that the growing interest in state control of health matters warranted a conference of state boards of health. With

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45 For a list of the dates of the establishment of all state boards, see Kerr and Moll, Organization, Powers, and Duties, 12.

46 Comparison of leading features of Special Acts by which State Boards of Health have been established, "Journal of Social Science, No. VI, 1874, pp. 211-212; First Biennial Report of the State Board of Health of California, 1870-1871 (Sacramento, 1871), 15-16; Boston Medical and Surgical Journal, C, 1879, p. 518.
the support of the American Social Science Association, another recently formed group devoted to the betterment of human welfare, such a conference was called, meeting in New York on May 21 and 22, 1874. This was the first of many such meetings.

Eight states with central boards of health, or a sanitary commission, sent delegates. Since all these boards possessed only advisory powers, the foremost question before the gathering concerned the relations of the state board to local health agencies. In Michigan the health board act required every community to set up a local health board, so this state's relations presented a less critical problem. Elsewhere the situation was different. In a great many localities in the other states there was a "great neglect of the matters of public health," together with a tendency for the local officers "to throw off their duties upon the State boards."

47 New Jersey came under this latter classification. Report of the Board of Health of the State of New Jersey, 1877 (Trenton, 1877), 7.

48 See Journal of Social Science, No. XVI, 1882, p. 73. In 1877 a law was passed in Massachusetts that required submission to the voters of the question of whether a local board of health should be established. Up to this time there had been no requirement for boards in towns or cities. Peabody, Historical Study, 56.

This resulted partly from the absence on those local boards of any qualified physician, and partly from a hesitancy to use the wide powers possessed under the common law by the boards. In this discussion of state-local relations, the possibility of serious conflict between the two was broached. Bowditch of Massachusetts thought it unlikely to arise. He and Elisha Harris of New York also thought it unadvisable to centralize all health laws and sanitary authority in the state board, for this type of administration was contrary to the political preference of the American people. 50

In the years immediately following this conference, however, the state boards found that their advisory powers were not adequate to accomplish the sanitary reforms so near to their hearts. To be sure, enlightening the public on sanitary problems would always be their "primary" task. But problems of a very practical nature were always arising — problems "where talking and advising will not answer the purpose; something must be done, and the State Board of Health is expected to do it." Such action, it was pointed out, "requires administrative powers, and in each state, one after the other, such powers have been granted, or will be." 51

50 Ibid., 214, 220.

51 Journal of Social Science, No. XVI, 1882, p. 29.
Although the above observation was based on the experience of Massachusetts, other state health boards also found it necessary to petition for more authority. With no effective control at hand, the Iowa board, for example, found a reluctance on the part of local officials and physicians to comply with the health laws, one county medical society even passing a resolution declaring its intention to ignore the law. In Ohio the establishment of a state health board was resisted for years because "vast numbers" of the people would not relinquish to such a board "what they style their own personal liberty." The same story was repeated in one form or another in the other states.

Much of this opposition justified its stand under the heading of economy. The state boards suffered from the disadvantage of not being able to produce any concrete results to quiet such criticism, since their duties were of an advisory and not of an administrative nature. In New York City, where the health department spent large sums in actual sanitary chores and improve-

52. Fourth Biennial Report of the Iowa State Board of Health, 1885-87 (Des Moines, 1887), 15.

ments — $88,739.26 in 1866, for example — it could be pointedly emphasized that the new board spent far less money than the health department under the old system, yet accomplished far more.54 The state health departments, though, were expending moneys heretofore not appropriated, and many a legislator and his constituent objected when no results that could be seen with the eye were forthcoming. At the Conference of Boards of Public Health in 1874 Professor Charles F. Chandler, of New York City, reminded his listeners that "the question of economy in the establishment of health boards, the economy of sanitary regulations, and their enforcement, had never been fully presented to the public." He urged that an argument based on the "pecuniary advantage" of health boards be heard more often.55

54 Second Annual Report of the Metropolitan Health Board of New York, 1867, 46. The City Inspector's department had expended $205,401.16 in 1865.

55 "Conference of Boards of Public Health," loc. cit., 220. Just about this time a number of articles appeared in which the economic gains of a public health program were totaled in dollars and cents. This feat was accomplished by estimating first how much a life was worth and secondly how many lives were probably saved. For examples, see Edward Jarvis, "Political Economy of Health," Fifth Annual Report of the Massachusetts Board of Health, 1874, 341 ff.; W. E. Boardman, "The Value of Health to the State," ibid., VI, 1875, 57 ff.; cf. Henry I. Sigerist, "The Value of Health to a City. Two Lectures, Delivered in 1873, by Max von Pettenkofer," Bulletin of the
The states could not be accused of a spendthrift recklessness in health matters, judging from the amounts appropriated. The Massachusetts board expended on the average little more than $4,000 a year, while in Michigan about $1,800 yearly, excluding the secretary's salary, sufficed. One argument for the establishment of a board in Pennsylvania in 1878 was the small appropriation required—a mere $2,000 above compensation for the executive officer. Yet legislatures balked at even these small sums, as in the case of Massachusetts in 1879, and as late as the first decade of the next century three-fourths of the state boards were considered mere hollow shells because of pinchpenny appropriations.

What few funds were allotted to these new state boards soon became exhausted in trifling miscellaneous

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History of Medicine, X, 1941, pp. 473-503, 593-613. Sigrist warns his readers that "We are often inclined to believe that the economic approach to medical problems is new, that we [moderns] inaugurated it. This is not the case." Ibid., 474.

56Richardson, Summary of Seven Years' Work, 42; Lee, "Sanitary Legislation in the Light of History," loc. cit., 429. Typically, in Illinois the appropriation soared only when an epidemic threatened; after the danger had disappeared it sank to its former "niggardly" level. Isaac D. Rawlings, The Rise and Fall of Disease in Illinois (Springfield, 1927), 139.

expenses. Fortunately, each state law provided for the publication of the annual or biennial reports. All of these reports followed much the same pattern, with that of Massachusetts setting the pace during the 1870's.\footnote{For instance, in 1874 the length of the Massachusetts report was 566 pages; that of California, 240; Louisiana, 203; Virginia, 15; Minnesota, 98; and Michigan, 101.} In the front appeared a short review of the year by the secretary and a general statement signed by the board as a whole; the rest of the pages were then devoted to special papers and studies. The more elaborate reports elicited long reviews, mostly favorable, from such prominent medical journals as the \textit{Boston Medical and Surgical Journal} and the \textit{American Journal of the Medical Sciences},\footnote{See for example \textit{Boston Medical and Surgical Journal}, LXXXIX, 47; XC, 288, 528-530; XCII, 535-536; XCIV, 605-607; C, 518, 897-899; and \textit{American Journal of the Medical Sciences}, LXVIII, 208-219; LXXVI, 512-516.} and even the lay periodicals devoted considerable space to analysing the contents. Here the praise was less complimentary, although the \textit{Atlantic Monthly} commended the Massachusetts board on its "exemplary literary activity," and on another occasion announced that the report "abounds in matter interesting to the general reader...."\footnote{[W. James], "Fifth Annual Report of the State Board of Health of Massachusetts," \textit{Atlantic Monthly}, XXXIV, 1874, p. 234; [M. Wyman], "Second Annual Report of the State Board of Health of Massachusetts," \textit{ibid.}, XXVII, 1871, p. 772.} Nonetheless, the want of
original scientific work was decried, and Charles Francis Adams severely criticized the second and third report issued by the Massachusetts board as being "too diffuse." These reports attempted to perform two duties: to instruct local health officers and physicians in the latest knowledge and methods of sanitary science, and to educate the people regarding the best means to avoid disease and accidents. How effectively they accomplished either aim cannot, of course, be measured exactly. Sanitarians of that day believed that the influence of these reports reached into almost every town and village. As proof, the secretary of the Michigan board asserted that after the publication of an article on "Illuminating Oils" in the annual report, "the newspapers of the State have not contained so many accounts of horrible accidents from the use of kerosene oil." Such slim evidence is not conclusive, yet the state boards contributed significantly to forwarding the public health movement. And just as their advent was made


possible and their path smoothed by the swift growth of local health agencies, so did the swelling numbers of state boards presage the coming of a national department of health. More importantly, the rapid creation of state boards during the 1870's evidenced the keener interest of the average citizen in sanitary science, and this is the essential foundation upon which a successful public health program must be built.
Chapter VI
THE AMERICAN PUBLIC HEALTH ASSOCIATION

The accomplishments of sanitary science can only be gauged with accuracy over a period of years or even decades. The public, ever more willing to support reforms that promised quicker results, seldom became ardently excited about the public health movement. This chronic indifference toward preventive medicine offered to the sanitarian of the seventies a challenge that he met with every means at his command.

The campaign to interest the general public in health reform began with Shattuck, became more vocal in the late fifties, intensified after the Civil War, and came into full strength in the seventies. Necessarily, the first inroads into public apathy occurred in the more populous sections, although Michigan can perhaps be cited as the exception to prove the rule. A poll of physicians in the forty-eight states and territories in 1876 disclosed that only eight legislatures evinced any interest in the health of their people.¹ Most of the western and southern doctors submitted pessimistic reports, while from Kentucky came word that its legislature believed in

¹Henry I. Bowditch, Public Hygiene in America, 41-42.
"No prevention of disease, except by the use of...our Old Bourbon."2

Discouraging as this may have seemed at first glance to a fervent sanitarian, nevertheless progress in educating the public was being made.3 One sign of a sharpened interest in sanitation was the significant increase of writings on the subject. Leypoldt's American Catalogue of 1875 listed only five works on hygiene (public health) printed between 1850-1865 and fifty-four between 1866-1875. In this latter period, also, nine works were placed under the heading Sewage, two under Drainage, and six under Water Supply, against no titles for the earlier period.4

A better measuring stick is the Index-Catalogue of the Surgeon-General's library. Classified under History of Hygiene are only two books published in the 1860's, nineteen in the 1870's, and one in the first half of the 1880's. Under Public Hygiene are twenty-three titles printed in the sixties, forty-seven issued during the next ten years, and twenty-seven between 1880-1885.5 The Index

2 Ibid., 163.

3 Letter of J. M. Toner to Henry I. Bowditch, April 1, 1876, ibid., 150, also 38.

4 F. Leypoldt, The American Catalogue; Subject Entries to 1876 (New York, 1881).

5 Index-Catalogue of the Library of the Surgeon-General's Office, United States Army (Washington, 1870-), VI.
Medicus, a guide to current articles and books on medicine, tells much the same story. In its first year, 1879, current writings on state medicine took up sixty-four pages, in the next year sixty-three pages, and fifteen years later, in 1894, only forty-eight pages. But perhaps the most convincing evidence that the decade of the seventies had become sanitary-minded was the inclusion of a special bibliography on public hygiene in the first volume of the Index Medicus. The compiler, John Shaw Billings, had this to say in his introduction:

During the last five or six years I have received so many requests for bibliographical data in regard to Public Hygiene and subjects connected with it, and it seems so evident that the demand for such information will increase with the steadily increasing number of State and Municipal Boards of Health and of persons interested in them, that it has seemed proper to make an attempt to supply the demand so far as material, time, and space will permit.

Part of these writings, of course, were devoted to popularizing personal hygiene rather than preventive medicine. The American physique of 1870 still could not meet the standards of other lands; "though wiry, alert, and full of nerve-power," it was "too slight and arid"

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6Index Medicus; A Monthly Classified Record of the Current Medical Literature of the World (New York, Washington, etc., 1879-), I, II, XV.

7Ibid., I, 164. For the complete bibliography see pp. 164-168, 272-276, 370-372, 419-420, 468.
and "not well-lubricated." These unlubricated bodies appeared to get out of order more frequently than better-oiled frames elsewhere; the fact that several health insurance companies using English rates had quickly failed convinced one contemporary observer that there must be a great deal more sickness among the well-to-do classes in the United States than in either England or Scotland.

A host of works devoted to correcting this situation soon appeared on the book stalls. Pioneer works in health education were usually rich in good intentions but poor in presentation. Chavisse's Advice to a Mother, one of the "most popular sellers" about 1870, arranged its material in question and answer form with these results:

Q. I wish to consult you on many subjects appertaining to the management and care of children. Will you favor me with your advice and counsel?

A. I shall be happy to accede to your request and give you the fruits of my experience in the clearest manner I am able and in the simplest language I can command — freed from all technicalities.

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Other efforts, more "faddish" than this, drew a stinging rebuke from Harper's Weekly, which castigated most writers on personal hygiene as "impractical altruists" whose disciples were mostly "weakminded." "Such painstaking as is enjoined by some writers and lecturers on health is really so irrational as to degrade the subject." 11

Such "degrading" writings, however, made up but a fragment of the imposing body of health literature that flowed from the presses. Newspapers and periodicals had opened their columns to reform movements of every kind, and public health shared in this opportunity to reach a wider audience. 12 Reform was fast becoming a popular cry, raised in protest against the unscrupulous practices of business, the badly hidden venality of officeholders, and the increase of feverish speculation. The contrast between a new industrial "plutocracy" and a spreading pauper-


12"A popular writer sits beside the "Autocrat of the Breakfast Table," and discusses sewerage in the "Atlantic Monthly" with infinite gusto, and apparently to the satisfaction of all readers of this popular monthly." Bowditch, Public Hygiene, 38. See also New York Tribune, August 10, 1881, p. 4; John S. Billings, "The National Board of Health," Plumber and Sanitary Engineer, III, 1880, p. 47. Aside from the magazine Sanitarian, edited by A. M. Bell, journals devoted solely to health affairs belonged to the "faddish" schools of medicine and added very little of the sensible to sanitary science.
ism gave currency to the phrase that "the rich become richer, the poor poorer." Pauperism, as it cast deeper and deeper shadows over the land after 1873, brought with it sickness and disease. Concerning which came first — poverty or disease — there could be no final word, but all humanitarians of that day knew that the two formed an indissoluble partnership. Thus, state medicine provided one avenue toward a solution of the pauper problem.

Preventive hygiene as viewed by the sanitarian of the seventies consisted primarily of remedies applied to the environment in which man lived. Attacks were launched against every conceivable condition that might breed or encourage disease. Many sanitary scientists, to the "scorn and pity" of the more conservative among their numbers, thought that in environmental conditions they had found the causes of all disease. However much these men might disagree about causes, all were in accord that


14 By the end of the seventies it was estimated that three million persons had been compelled to depend on some sort of charity or relief. See Richard T. Ely, "Pauperism in the United States," in Harper's Encyclopedia of United States History (10 vols., New York, c. 1910), VII, 89.

most ailments could be prevented by stringent sanitary precautions. Those matters to which they directed their attention could be separated into several broad divisions.

Vital statistics, for instance, had assumed a new significance when medical science after the 1830's abandoned the theoretical systems of Dr. Benjamin Rush and others and adopted in their stead the accurate recording and analysis of factual evidence. Mortality rates revealed danger zones in the environment, it was believed, and furthermore, a study of those environmental factors common to certain diseases must eventually and inevitably lead straight to the causes. Accordingly, sanitarians redoubled their efforts to increase the areas in which births, marriages, and deaths were registered. At the time less than 20 per cent of the states had compulsory registration, and even those states that required registration obtained irregular and imperfect returns. In Massachusetts, for example, where the collection of vital statistics had long been established, returns proved unreliable as well as very confusing — listed as the cause of death were such "scientific" reasons as death caused by "five doctors."

"delicate from birth," "diresars," "troubled in the brain," and "artry lung bursted." ¹⁷ Papers on the collection and interpretation of mortality figures appeared in the reports of state and city health boards; more and more medical and scientific journals began printing the weekly or monthly mortality records; and articles on vital statistics and the message they contained found wider audiences through the medium of other periodicals.

The most popular sanitary topic of the day, however, was sewerage. Article followed upon article, book upon book, as the ramifications of this subject were explored. Nor were any other sanitary problems "discussed with greater ability than those connected with the disposal of sewerage," reported the Scientific American at the beginning of the decade. However capable the discussion, the conclusions arrived at were not always as sound. This same magazine, in its very next breath, endorsed an opinion that the water closet was ultimately doomed to oblivion.¹⁸ Nevertheless, here was an important field in which the emerging American genius for mechanical inventiveness could aid public health.

¹⁷Eighth Annual Report of the Massachusetts State Board of Health, 1877, 239, 262.
¹⁸Scientific American, n.s., XXI, 1869, p. 57.
No good sewerage system had yet been installed in an American city; on inspection Boston's much admired sewers proved to be so choked with mud and filth that they no longer carried out their purpose adequately. Chicago, which prided itself on its sewerage system, still had in 1877 some thirty thousand private cesspools within the city limits, and Philadelphia and Washington admitted to eighty-two and fifty-six thousand respectively. Bad as these conditions were, an even more chaotic system prevailed in the towns and villages throughout the nation. A survey of more than eighty towns in 1876 disclosed that only twenty-two had sewers, and these were very imperfect. The usual method of disposing of sewerage or household offal consisted of haphazard civic collection, or, more frequently, by individual initiative. In two towns the creed "do as you please" and "public opinion [the] only law" governed the removal of excreta. The collection of garbage and house slops suffered from the same loose system. Although the larger cities had companies or agencies that made regular collections by cart, in most communities the practice was to throw household refuse into vacant lots or "where each

19 Bowditch, Public Hygiene, 105.

one wishes.\footnote{21Bowditch, Public Hygiene, 108-111.}

To change all this the public had to be aroused to the health hazards of such conditions. Articles in technical journals, such as the \textit{Scientific American}, or the reports of the state boards of health, had a limited circle of readers. A more prominent sounding board was needed. The popular periodicals, of course, provided the best medium through which to awake public consciousness, and one expert on sewerage soon found his way into their pages. George E. Waring, in addition to publishing a book on sewerage, ran a series of articles in the \textit{Atlantic Monthly} in 1875, and other articles of his appeared shortly afterwards in the \textit{Penn Monthly} and the \textit{Journal of Social Science}.\footnote{22Waring (1833-1898) installed a sewerage system based on his theories in Memphis in 1879-1880. Although effective in part, it led him later to modify his opinion regarding the separation of sewerage from surface drainage. He became street commissioner of New York City in 1895, and was sent to Havana in 1898 to introduce sanitary reforms to that city. Here he contracted yellow fever and died. D.A.B., XIX, pp. 456-457. For some of his writings see "Sanitary Drainage of Houses and Towns," \textit{Atlantic Monthly}, XXXVI, 1875, pp. 339-355, 427-442, 535-553; "House-Drainage and Sewerage," \textit{Penn Monthly}, IX, 1878, pp. 215-232; "The Sewerage of the Smaller Towns," \textit{Journal of Social Science}, No. X, 1879, pp. 180-194. Waring also had several articles in \textit{Scribner's Monthly}, \textit{Sanitary Engineer}, and other magazines, and published a book entitled \textit{The Sanitary Drainage of Houses and Towns} (New York, 1876).} Waring urged the elimination of all pri-
private vaults and cesspools. In their place he advised a system of "impervious" sewers, designed to handle sewerage only. Surface waters should have separate drains on the principle that "A good sewer is a bad drain. A good drain is a dangerous sewer." The outflow from every house should be carried outside the town immediately as a safeguard to health. His campaign succeeded almost too well — a physician reported in 1876 that there seemed to be arising among the citizens a kind of panic relative to the drains of their own houses, and they have a great horror of the least odor of sewer gases.

Before efficient sewerage of this type could be installed in most communities, a sufficient water supply was necessary for flushing purposes. Sparsely populated communities still depended on private wells and cisterns for their household water, but nearly all large urban centers had public water supplies. Seventeen per cent of the nation's population had access to such supplies in 1870;

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23 Orlando W. Wight, Maxims of Public Health (New York, 1884), 47.

24 The question of the ultimate disposal of sewerage became a matter of controversy in the seventies. Many sanitary scientists advocated its use as fertilizer, and in England experiments to convert it to such uses were being carried out with some success.

25 Quoted in Bowditch, Public Hygiene, 38.
ten years later this had increased to 23.5 per cent.\textsuperscript{26}

Very little could be said in favor of the quality of the water, however. Its purity was still determined by the crude standards of clarity and of freedom from taste, odor, and color. In the early seventies several filters were constructed, based on the information brought back from Europe by James Kirkland, a civil engineer who had been sent abroad by the city of St. Louis in 1866 to investigate the subject. At Poughkeepsie, for instance, a filter was installed in 1872 to clear the muddy waters of the Hudson River. Yet it was not until after 1880 that American sanitarians really began to concentrate their attention on this vital problem. The significant studies of William Ripley Nichols for the Massachusetts Board of Health in 1878 can be taken as the starting point for experimentation in water purification in America. Not until the turn of the century did any great numbers of the American people reap the benefits of these studies on water filtration and purification.\textsuperscript{27}

Both the doctor and the layman of the seventies subjected the air that they breathed to the same crude

\textsuperscript{26}Samuel W. Abbott, \textit{Past and Present Condition of Public Hygiene and Medicine in the United States}, 36.

\textsuperscript{27}George C. Whipple, "Fifty Years of Water Purification," in Ravenel, \textit{Half Century}, 162, 163, 166.
standards applied to water. Since it had not been determined conclusively "as to which is the greater source of typhoid fever, foul air, or impure water," the general public looked with about equal suspicion on each.\textsuperscript{28} To be particularly avoided were dampness and obnoxious odors — the first because it was a contributing "cause" of consumption and other fevers, the latter because it sapped one's physical constitution. Health boards of the 1870's, therefore, usually directed their first official acts to the removal or elimination of slaughterhouses, and made valiant efforts to have swamps and marsh lands drained.

The air indoors was viewed with perhaps even more alarm than that outdoors. Chemistry and the physiology of respiration had shown that breathing converts innocent oxygen into "poisonous" carbon dioxide, and even the most unscientific layman, said one writer, "knows that carbonic acid is fatal." Health specialists bent every effort to prevent "people from being poisoned by their own exhalations."\textsuperscript{29} So strong became this fear of "vitiated" air that open-air enthusiasts and health fad-


\textsuperscript{29}George T. Palmer, "What Fifty Years Have Done for Ventilation," in Ravenel, \textit{Half Century}, 336.
dists found the ground already prepared for whatever seeds they wished to sow. Many of the first crude experiments in ventilation seemed to bear out the theory of the deadliness of exhaled carbon dioxide, and for that reason ventilation experts concerned themselves mainly with how many cubic feet of air space were needed per person indoors. The heat and moisture of the air received little attention. What advances were made in the seventies in ventilation were due to a growth in the popularity of steam radiators, which had been first introduced in the 1850's.30

Holding such beliefs, it naturally followed that sanitarians esteemed disinfection as a powerful weapon in the battle against disease. "Things" were considered more treacherous than persons in the transmission of disease. Doctors accused "letters, walls, books, umbrellas" and other inanimate objects of passing on infection,31 and often a holocaust of household goods signalized the end of an illness in a family. Hence, in these early writings on sanitary science the relative merits of smoldering sulphur, formaldehyde, or steam fumigation formed the core of many learned discussions.

30Ibid., 342.

The introduction and widespread use of canned goods and prepared foods in the seventies raised yet another spectre to worry the sanitarian — food adulteration. City life created a new type of market for food products, a market where producer and consumer never came in contact with one another. Merchandisers and processors of food products began to resort to adulteration in order to reap more generous profits. The prevalence of this practice brought on a storm of protest. Public health advocates soon found themselves in the thick of the fight, for the accusation that active poisons were being introduced into food encroached upon their province. Lively discussions on adulteration filled the pages of the annual reports of the state boards of health and dominated the proceedings at sanitary and medical conventions. Sensational charges of food being poisoned by tin cans, glucose, and other substances were pressed home at the 1880 meeting of the American Social Science Association by physicians from Chicago and elsewhere. Reports of such adulterations in the daily papers helped not at all to quiet the public mind. Often these newspaper stories were so phrased as to be misleading. The following extract from the Boston Morning Journal is a good example:

A recent lawsuit in Buffalo...brought to light...that a single establishment in that city consumed six thousand bushels of corn in the manufacture of sugar, and the syrup called glucose, used by sugar and syrup dealers, confectioners, and so forth, for the purposes of adulteration.... Sulphuric, muriatic and nitric acid are extensively employed in extracting the sugar from the corn. One gets an idea of the virulence of these poisons from the statement that they so rot the timbers of the factory building...that men are constantly employed in making repairs.33

This vehement campaign against adulteration frequently overreached the truth, going so far, it was claimed, as to invent "statements of poisonous admixtures that are unknown, in order to find employment for alarmist chemists and microscopists."34

Yet from the viewpoint of public health the controversy produced beneficial results in the form of new state laws on food adulteration, New York state passing the first in 1881, followed by Michigan, New Jersey, and Illinois in the same year, and Massachusetts in 1882. In both New York and Massachusetts the board of health admin-


34Sanitary Engineer (New York), IV, 1881, p. 276. This magazine filled its columns with articles and letters on the food adulteration controversy, and as a supplement to its issue of November 15, 1881, it printed the prize essays of a contest on food adulteration that the National Board of Trade had sponsored.
istered the new laws.\textsuperscript{35} Most leaders of the public health movement took a sensible stand on the issue, and echoed the views of William Ripley Nichols of Massachusetts, who after investigation insisted that "adulterations now practiced are of a fraudulent and not of a dangerous character."\textsuperscript{36} An investigation of food products in New Haven, Connecticut corroborated Nichol's opinion that the public suffered no serious loss of goods or health from adulteration, except for a few articles, such as baking powder and milk.\textsuperscript{37}

Adulteration of milk was very common, for it was most convenient to effect and very easy to disguise. In 1870 twelve thousand dollars each day came out of the pockets of New York citizens to buy water — the water used as an adulterate in milk.\textsuperscript{38} Although this economic loss was serious, more to the point was the injury to health of weakened or contaminated milk. Both New York City and Boston as early as 1860 had taken some measures to insure the

\textsuperscript{35}Abbott, Past and Present Condition, 32; Carl L. Alsberg, "Progress in Federal Food Control," in Ravenel, Half Century, 214. For more details of legislation on this subject, see ibid., 209-215.

\textsuperscript{36}Journal of Social Science, No. XIII, 1881, p. 135.


\textsuperscript{38}Scientific American, XXIV, 1871, p. 200.
purity of their milk supply, but after these initial efforts sanitarians made no sustained or systematic study of the problem until the very end of the 1870's.\textsuperscript{39} The public displayed even less interest. The Commissioner of Health of Milwaukee inspected the dairies of that city, then publicly invited the citizens to call at his office to read a graphic description of the places from which they obtained their milk. Eleven of the 120,000 invited citizens came to see the record. How could one explain this apathy in a rational way, asked the Commissioner, when it was well known that "about fifty per cent of a city's mortality is of children under five years of age."\textsuperscript{40}

This high rate of infant mortality in the seventies, apart from its relation to the milk supply, proved a baffling problem to sanitarians. As soon as the first tabulations of vital statistics were made public, the high death rate among children beckoned as a most fruitful field for preventive medicine. Yet progress in this direction advanced slowly, and many of the preventive measures

\textsuperscript{39}Public health authorities did not awaken to the importance of milk in preventing disease until the publication of an article by Dr. E. Hart of England in 1881, in which there was listed a large number of epidemics that could be directly traced to milk. Charles E. North, "Milk and Its Relation to Public Health," in Ravenel, Half Century, 244.

\textsuperscript{40}Wight, Maxims of Public Health, 34.
adopted led to just the opposite results intended. For
instance, the mortality in the two New York and one Phila-
delphia hospitals for foundlings ran much higher than that
of children "left to the cold charities of the world."41
Boston and Chicago had also established children's hospita-
tals by the seventies, and by 1872 there were six day
nurseries in existence.42 But aside from these sporadic
efforts the only early attempt on the part of state medi-
cine to lower infant mortality occurred in New York City.
The exceptional heavy death toll of babies in the city's
tenements in the summer of 1874 aroused wide public dis-
cussion, and a pamphlet on the care of the baby was print-
ed and distributed free. A few years later the state leg-
islature directed that ten thousand dollars be spent for
sending doctors into the tenement districts to treat sick
babies and to educate mothers in their care.43

In these early years private organizations work-
ed more effectively in the field of child welfare than did
government agencies. Of significance was the establish-
ment in 1875 of the Society for the Prevention of Cruelty


43 Ibid., 306.
to Children, patterned after the animal humane society of similar name. The history of infant health until after 1900 is a record of the efforts of various private groups. District nursing, first introduced by the Women's Branch of the New York City Mission in 1877 or earlier, widened its scope of useful service under the auspices of other voluntary organizations holding like ideals. These private groups hired trained nurses to accompany the dispensary doctors into the homes of the poor. 44

Voluntary efforts of this type were not confined to large cities. Shortly after the Civil War there sprang up throughout the nation Village Improvement Societies whose "beneficent" purpose consisted of remedying the generally "unsightly" appearance of smaller communities, 45 and making them "more healthy, more cheerful, more attractive." 46 Hygienic improvements should be the first consideration of these societies, the talented daughter of


45 "Village Improvement Societies," Scribner's Monthly, XII, 1876, p. 750.

James Fenimore Cooper asserted in 1869, and this goal could only be reached by an ample supply of pure water, adequate drains, and proper ventilation.\(^47\) Throughout the 1870's the Village Improvement Societies grew in numbers and worked toward these ends, while in Newport the citizens organized a Sanitary Protective Association which hired a sanitary expert the year round to go from home to home inspecting the drains.\(^48\)

This increased attention to sanitary matters reflected the changing ideas and attitude of the American people toward society in general. Two factors, urbanization and science, had begun to destroy ancient shibboleths. Darwinism, particularly, speeded up the emancipation of men's minds, and narrow theology, one sanitarian rejoiced, was fast losing its hold on people.\(^49\) Men's eyes turned from the "other world" of the medieval churchman and be-

\(^{47}\)Ibid., 362-363; see also George E. Waring, "Village Improvement Associations," Scribner's Monthly, XIV, 1877, pp. 99-107.


\(^{49}\)Benjamin Lee, "Sanitary Legislation in the Light of History," Penn Monthly, IX, 1878, p. 422. For the effect of Darwinism on theology see Jacques Barzun, Darwin, Marx, Wagner; Critique of a Heritage (Boston, 1941), and Bert J. Loewenberg, "Darwinism Comes to America, 1859-1900," Mississippi Valley Historical Review, XXVIII, 1941, pp. 339-368.
came fastened on the everyday world about them. And the return to favor of the classical ideals — love of comfort and of beauty — inevitably led to the promotion of hygiene and sanitation.  

But in the seventies enlightened support of preventive medicine came solely from a small, intelligent group in society. Much opposition to health reform remained to be overcome. Voluntary efforts, it soon became apparent, could not succeed without the backing of the state's authority. The easiest method to enlist state aid was to subject the state legislatures to the combined pressure of those interested in health reform.

The vital role played by the state medical societies in this task cannot be overemphasized. Even if it be granted that laymen contributed as much or more than physicians to furthering the early public health program, the charge that "medical men and medical societies have been


51 It was not only the poorer classes that needed education in sanitary precautions or that resisted health reform. Newport, a "tony" summer resort, as late as 1886 was outstanding for its "filthy" condition. John M'Curdy, "Health Boards," First Annual Report of the State Board of Health of Ohio, 1886, 220. See also Charles F. Wingate, "The Unsanitary Homes of the Rich," North American Review, CXXXVII, 1883, pp. 172-184.

52 Bowditch, Public Hygiene, 29-30, 32.
slow and timid in their support of health laws and health reforms appears unfounded and unfair. All early state health boards owed their creation to the active support of the state medical societies.

These medical societies were the logical candidates for taking the lead in sponsoring health legislation. The sanitary associations founded in the two decades prior to 1870 had been unable to maintain a continuous existence, therefore they lacked the necessary strength or prestige to influence the state legislatures. The case of the medical societies was entirely different. City medical societies had been founded as early as 1735 (Boston) and 1749 (New York), and the first state society was organized in New Jersey in 1766, the second, Massachusetts, in 1781. By 1850 nearly every state had laws authorizing the establishment of city and state medical societies.


55 In 1898 the New Jersey Sanitary Association boasted the longest continuous existence. It was founded in 1874. Abbott, *Past and Present*, 19.

56 Fielding H. Garrison, *An Introduction to the History of Medicine; with Medical Chronology, Suggestions for Study and Bibliographic Data* (Philadelphia, 1924), 422.

57 Nathan S. Davis, *History of Medicine with the Code of Medical Ethics* (Chicago, 1903), 140.
and in 1879 thirty-seven state medical societies and 557 county societies were in existence. 58

The more capable and public-spirited medical men in these state societies could not avoid being influenced by the accomplishments and claims of the new sanitary science. Surely no better warrant for health laws could exist than the fact that the "death-rate decreases in the same ratio with which sanitary improvements are enforced." 59

Thus the state societies led in memorializing and petitioning the legislatures for state boards of health, 60 and in North Carolina and Alabama the state government authorized the medical society itself to fulfill the functions of a health board. 61

Not all local medical societies,\(^{62}\) or all doctors, agreed with the stand taken by the state medical societies, of course. Few physicians received any training in either public or private hygiene during their education, for only a third of the medical schools paid the least attention to preventive medicine.\(^{63}\) Those doctors who later developed an interest in public health did so from their observation of the need for health agencies and laws. But laws alone could never be enough. These doctors believed further, as one of them expressed it, that "as the dentist now undertakes to modify and to guide the various processes of dentition from earliest childhood to old age," so should the physician "be the monitor and guide for the entire body from birth to death."\(^{64}\)

Yet, if one can judge from the attendance at the Public Hygiene sessions of the American Medical Association,\(^{65}\) physicians of this stripe were rare. This national association, in its capacity as the representative of the medical profession, displayed slight interest in health


\(^{63}\)Bowditch, Public Hygiene, 296.

\(^{64}\)Fifth Annual Report of Massachusetts Board of Health, 1874, 36.

\(^{65}\)Bowditch, Public Hygiene, 37.
legislation, letting the state societies monopolize this field of activity.

Some national organization for the promotion of public health was badly needed, therefore, and in 1872 Stephen Smith of New York called together several of the more prominent sanitarians to discuss the problem. At this preliminary informal gathering a plan for establishing a national public health association was formulated, and invitations were issued to officers of existing health agencies throughout the country and to other persons interested in sanitary science. The first regular meeting convened at Long Branch, New Jersey, in September, 1872. A constitution was adopted, and Stephen Smith elected president, and Elisha Harris secretary. The first convention of the newly organized American Public Health Association, held at Cincinnati, Ohio, in May, 1873, was well attended, and the proceedings attracted considerable public attention. 66

Great has been the influence of this national organization in forwarding the efficacy of public health in the United States. Established with but one specific purpose in mind, its wide membership, though dominated by

medical men, also included engineers, scientists, and laymen. The specialized knowledge of each member could be put to good use, for the public health program embraced all talents and all skills. Contributions of non-medical members soon proved fully as valuable, and in many cases as sensible, as those of physicians. 67

From its very first year the American Public Health Association published its annual proceedings, together with the papers read by the members at the yearly meeting. Every phase of preventive health was touched on by the experts and specialists of the Association, and these volumes, as it has been pointed out, contain within them "a good history of the public health movement." 68 Certainly they succeeded in keeping the sanitarian informed of the latest theories and information in his field, and in addition helped to enlighten the general public on hygienic matters.


68 Ravenel, Half Century, 21. In the first twenty-five years of the Association twenty-two volumes were published, containing 695 articles and 9,117 pages of reading matter. Ibid., 20.
A roll call of the first ten presidents of the Association gives a good indication of the influence wielded by the organization in its early days. All these men ranked high in the medical profession, and almost all made important contributions to the science of sanitation. Stephen Smith, the first president, and Elisha Harris, the fifth, had already contributed importantly to the advance of state medicine. Joseph M. Toner (1825-1896), the second president, founded the library of the American Medical Association and wrote more than fifty papers on medical subjects; Edwin M. Snow (1820-1880), the third, was registrar of vital statistics in Providence, Rhode Island, and published several original contributions on the etiology of disease; John J. Rauch (1828-1894), the fourth, helped to organize the Chicago Board of Health and published valuable articles on the place of drainage and public parks in a municipal health program; James L. Cabell (1813-1889), the sixth, was appointed the president of the National Board of Health when it was created in 1879; John S. Billings (1839-1913), the seventh, founded the Surgeon-General's library and its world famous index, and introduced original and radical design into hospital construction; Robert C. Kedzie (1823-1902), the ninth, devoted his time to teaching sanitation throughout Michigan and succeeded in stimulating local boards of health to solve their own
sanitary problems; and Ezra M. Hunt (1830-1894), the tenth president, was secretary of the New Jersey Board of Health and published many special studies of public health problems.69

The public press greeted the new organization with enthusiasm. The New York Tribune reported its annual proceedings at length,70 although cautioning its readers not to place "too confiding a faith in the immediate effect" of the Association's efforts, for "with regard to this business of sanitary science...we, as a nation, scarcely know its theory, even in the alphabet."71 And difficult as it was to obtain hygienic reform in New York City and Philadelphia, "the neglect and ignorance of sanitary precautions became all the greater the further one penetrated inland." "It is for this Association to tell us what we need, and that in as plain and direct words as possible."72


70 For example, New York Tribune, November 10, 11, 12, and 13, 1875; November 20, 21, 22, and 23, 1878. The New York Times generously devoted even more space than the Tribune to reporting the proceedings. American Medical Association Transactions, XXVI, 1875, p. 329.

71 New York Tribune, November 22, 1878, p. 4.

72 Ibid.
The members of the Association felt this responsibility keenly; they saw in preventive medicine a cure for many of the social ills of the contemporary scene and a means to lighten men's troubles and to lengthen their hours on this earth. But they also realized that governmental authority had to be invoked to accomplish the necessary health reforms. The organization to which they all belonged could be employed to this end. Just six years after the first convention of the American Public Health Association the Federal Government authorized the creation of a National Board of Health.

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Chapter VII
THE NATIONAL BOARD OF HEALTH

Although the American Public Health Association and other similar groups advocated and encouraged Federal health legislation, it was a disastrous epidemic of yellow fever in 1878 that more than any other factor led to the creation of the National Board of Health in 1879.

From one point of view, epidemics might well be considered savers of lives, not destroyers.\(^1\) Nothing pertaining to health excited the minds of the people so much as an epidemic. As a stimulus to health reform it proved far more effective than years of reasoned talk. How different was the usual attitude to the endemic diseases that exacted a heavy but consistent death toll each year! Because such diseases were habitual occurrences they were largely ignored. The drop in typhoid rates in Boston after the Cochituate water supply was introduced received only mild commendation,\(^2\) and the splendid work of the Vac-

\(^1\) C.-E. A. Winslow, The Life of Hermann M. Biggs; Physician and Statesman of the Public Health (Philadelphia, 1929), 91.

\(^2\) "The Hygiene of Water," National Quarterly Review, XL, 1880, p. 74; Second Annual Report of the Massachusetts...
oination Corps of Inspectors of New York City, which succeeded in reducing the number of smallpox deaths from 388 in the first quarter of 1872 to five in the same period in 1877, won little more than polite applause. Typhoid, scarlet fever, smallpox, and typhus were never idle in the large cities of the seaboard, and the conditions favorable to their presence were even more acute in the new, sprawling cities to the west. Even though most citizens agreed with the sanitarian that the virulence of these diseases could be tempered by sanitary reform, nevertheless progress in this direction proceeded exasperatingly slow. Even less attention was paid to consumption and diphtheria, two diseases that claimed more lives year after year than any epidemical infection.


New York Tribune, April 14, 1877, p. 2. New York City employed during the summer months from twenty to eighty inspectors who conducted a house to house canvass and who vaccinated all persons that could be persuaded to submit to it. The results of this program became immediately discernible in decreasing mortality rates. See Elisha Harris, "Health Laws and Their Administration," Journal of Social Science, No. II, 1870, pp. 179, 182; New York Tribune, September 2, 1876, p. 2.

Familiar afflictions soon produce their own anti-toxic stoicism. The pock-marked face had always been a part of human existence. Seemingly men had resigned themselves to the thought that such disfigurement must always be borne by the race, and even the well-founded hope of deliverance by vaccination penetrated their century-old inertia but falteringingly. Epidemics were cut from different cloth. Dramatic in their effects, they called for countermeasures that also were dramatic. These spectacular and mysterious scourges first awakened panic, then combative-ness. Man's first thought was to close the door through which the epidemic had entered, even though the damage had already been done. It can be truly stated that an epidemic or the threat of an epidemic inspired most of the health legislation enacted during the first half of the nineteenth century.5

Of all epidemic diseases, the two main offenders in America were cholera and yellow fever. The former ravaged the country for the first time in 1832-1834, when it leaped the Atlantic Ocean and travelled west across the continent, sparing hardly any village or community. In

many localities more than 15 per cent of the population fell victims to its death-dealing powers. In 1849 it paid a return visit, then again in 1854 and 1866, each visit milder than the preceding one. Its last return to these shores in epidemic proportions took place in 1873. In the 1866 and 1873 epidemics the agencies recently established to protect the public health demonstrated their worth. Had it not been for the "efficient management" of the Metropolitan Board of Health in 1866, New York would have suffered "a most disastrous explosion of the disease," and in its travels during 1873 cholera found the large cities with their new sanitary armor a far less favorable field for destruction than smaller villages or the rural areas.

From colonial times on, yellow fever had periodically invaded the mainland of North America. It was an unwelcome guest in almost half of the 185 years between 1693 and 1878. The havoc it wrought was just as deadly.

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8 Ibid., 663.


as that produced by cholera. In 1866 it attacked the southern states at the same time as cholera and proved much the more formidable foe of the two. Finally, in 1878, there occurred one of the most severe epidemics of yellow fever ever recorded in the United States. The disease rapidly sped up the Mississippi Valley into the states of the Old Northwest. An aroused, frightened citizenry determined that this time something should be done to prevent a recurrence of this national tragedy. The result of their determination was the National Board of Health and a Federal quarantine law.

The history of quarantine is essentially the history of yellow fever and cholera in America. Yellow fever epidemics in Philadelphia and Baltimore in 1793 and 1794, for example, led to the first municipal health committees, and indirectly to the first Federal legislation on public health matters — a quarantine measure in 1796. From the earliest times medical men and sanitarians had devoted a major portion of their thought to speculating on the nature of yellow fever and to devising methods of barring it from the United States.

More than 130 towns were afflicted, deaths totalled over 15,000, and the nation suffered an economic loss estimated at $100,000,000. See James W. Garner, "Federal Activity in the Interest of the Public Health," Yale Review, XIV, 1905, p. 186.
After the first quarantine order of Massachusetts in 1647 (or 1648), the states along the Atlantic coast, as occasions arose, adopted quarantine regulations to ward off threatened "plagues." In those states that possessed a port of preeminent importance the administration of these laws remained centralized under the state government. In Massachusetts and several other New England states, mainly because of the many ports of equal commercial importance and also because yellow fever very seldom penetrated that far north, the local town boards were left to their own discretion in applying quarantine.\textsuperscript{12}

This necessarily was an irregular, ineffective system, a wall with many breaches through which disease could enter and spread. The desirability of introducing uniformity in quarantine methods became recognized soon after the Federal Government was established. In 1796 a proposal was introduced into Congress that the President be given the power to control quarantine in all ports of the nation. In the lengthy debate that followed the commercial states of Pennsylvania, New York, and Massachusetts opposed interference, while the southern states supported Federal control of quarantine on the grounds that

\textsuperscript{12}Susan W. Peabody, \textit{Historical Study of Legislation Regarding Public Health in the States of New York and Massachusetts}, 74-75.
epidemical diseases, imported, affect the United States at large...not merely...the city where first imported.\textsuperscript{13}

The compromise decision was a resolution that authorized Federal agents to cooperate with state and port quarantine officers, but with no authority to interfere in any way. Three years later, in 1799, Congress passed an act instructing Federal employees how to conduct themselves when helping to carry out state health or state quarantine laws.\textsuperscript{14} Shortly afterwards, in 1800 and 1802, petitions favoring a national quarantine law were received from Philadelphia and New York City. These two cities had been mainly instrumental in killing the measure of 1796, but they now saw that epidemics had no respect for political boundaries — illustrating the aphorism that "it makes a difference whose ox is gored!"\textsuperscript{15} Congress, however, now had a precedent to follow and to worship and nothing was done. Apart from two abortive attempts to introduce quarantine bills in 1832 and 1859, the Federal Government left the states to their own quarantine devices until after the

\textsuperscript{13}\textit{Annals of Congress}, 4 Cong., 1 Sess., 1795-1796, V, 1356.

\textsuperscript{14}\textit{United States Statutes at Large}, I, 619-621.

\textsuperscript{15}William H. Allen, "Rise of the National Board of Health," \textit{Annals of the American Academy of Political and Social Science}, XV, 1900, p. 57.
Civil War.

In the early 1870's quarantine regulations of Massachusetts, Rhode Island, and most New England states remained a matter for decision by local authorities. New York, Pennsylvania, South Carolina, and other states more exposed to yellow fever epidemics had state control. New York City adopted particularly stringent rules, although enforcement at times was very lax. Inland states, even if not confronted with the problem of barring diseases originating in foreign parts, extended to their river and lake cities authority to exercise quarantine against water craft. All states, when the epidemical spread of disease raised the question of inter-city quarantine, acted with arbitrary authority against both land and water carriers or travellers. Persons were summarily ejected from their homes; streets and whole sections of towns were blocked off; and intercourse with other infected communities was absolutely forbidden. These internal measures did not forestall the inroads of epidemical contagions, however. The necessity of a uniform quarantine

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16 It is interesting to observe that cholera epidemics tended to stimulate the passage of laws affecting "nuisances," while yellow fever invasions were more often followed by quarantine regulations. See Peabody, Historical Study, 144, 145-151.

17 For examples see Report of the National Board of Health, 1885, 307-320.
system, to be enforced by the Federal Government, became a vital issue from the 1850's onward to those interested in forwarding the public health movement.

In 1866 the Federal Government made its first grant from the national treasury to aid the states in enforcing quarantine. Heretofore expenditures for health purposes had been confined solely to caring for the health of government employees or to the support of the Marine Hospital Service. The appropriation of 1866, therefore, marked the first step of the national government into the public health field.

In this same year, 1866, an attempt was launched in the Senate to establish a rigid national quarantine

18 The Marine Hospital Service had been established in 1798 to care for disabled or sick seamen. It built and maintained hospitals for this purpose. Although seamen contributed a small sum monthly to a fund for the maintenance of this service, the government soon found it necessary to subsidize the Marine Hospitals, which according to critics in Congress were too many and built in the most inappropriate places. In objecting to the annual appropriation of a quarter of a million dollars for the Marine Service, Senator Timothy O. Howe stated that "it was a favorite mode of starting a town in the West, if it was anywhere on a stream or on a good sized puddle, to get an appropriation for a marine hospital." Even the defenders of the service had always evinced an interest in epidemics and quarantine matters. For instances of this interest see Annual Report of the Surgeon-General of the Marine Hospital Service, 1875, 16, 143.
against Asiatic cholera, with the secretaries of War, Navy, and Treasury in charge. Supporters of the plan emphasized that throughout the country there existed a "general desire" for a "uniform system of quarantine." Their opponents, who carried the day, issued dire warnings that such a measure would bring state and Federal authorities into collision. Even more maddening to the sanitarians of that day was the argument that since cholera was not contagious but "exists in the air," to try to keep it out of the country would be like shooting arrows at the moon. This reason for legislative inaction, because it could not be refuted, proved particularly effective.

Resolutions asking for the creation of a national quarantine system were introduced into Congress in 1869 and 1871, and in 1872 a bill to establish a National Sanitary Bureau was placed before the Senate. This latter did not meet with a cordial reception, however.

In 1873-1874 both cholera and yellow fever struck again, the former in the North Central states, the latter

19Congressional Globe, 39 Cong., 1 Sess., 1866, Part 3, p. 2446. One Senator, in jest, proposed to refer the whole subject to the ventilation committee.

20However, in 1872 the Secretary of War was directed to detail army medical officers to visit ports subject to yellow fever in order to ascertain the best means of prevention. Statutes at Large, XVII, 396.
in its familiar stamping grounds of the South and lower Mississippi Valley. Immediately Congress received memorials from the cities of the gulf coast endorsing national control of quarantine regulations, and from the Northwest came petitions of the same tenor and signed by the National Board of Trade and other important groups. Under such pressure it is not surprising that the session of 1874 saw the introduction of a quarantine bill into the House of Representatives by Frederick G. Bromberg of Alabama. The bill passed the House, but the Senate took no action.

Southern members had become firmly convinced that their only salvation from the yellow fever curse lay in the use of the Federal power, however reluctant they were to resort to it. But northern commercial centers looked with suspicion on these efforts to hand over quarantine regulations to the Federal Government. The Journal of Commerce sounded the keynote of their protests when it boasted that New York City could more than match the medical skill of "the three Washington doctors whom it is proposed to put in charge of the national quarantine system."

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21 Congressional Record, 43 Cong., 1 Sess., 1874-1875, II, Part 5, p. 4562.
22 Ibid.
There was a good basis for this boast, but it could not have been defended had it been uttered in former years. The health officer of New York in 1874, Dr. S. Oakley Vander Poel, was without question both capable and honest. But he was the first man in that office "who had not caused scandal," according to the president of the city's board of health.24 As for Boston, during the epidemic of 1866 her businessmen had sent out circulars asking shippers to bring their vessels to that port because they would meet no quarantine rules to impede commerce.25 So long as local quarantine had no supervision, competition for business between ports meant that public health was likely to be sacrificed for private wealth.

Sanitarians of the North displayed much less interest in quarantine than did their southern brothers. In the North, where yellow fever very seldom caused extensive havoc, attention was chiefly focussed on the improvement of internal sanitary conditions, and cholera, it was believed, could better be circumvented by cleanliness of person and environment than by any policy of isolation or quarantine. More numerous and more active than

24Plumber and Sanitary Engineer, III, 1880, p. 48.
their southern colleagues, the northern sanitarians urged the eradication of nuisances and civic sanitation as the first steps in a public health program. Their lukewarmness to quarantine can be discerned from the fact that the American Medical Association, which was dominated by northern doctors, passed resolutions in 1871 and 1872 favoring a national system of quarantine but that was the extent of their activity in this field.\textsuperscript{26}

To the suggestion that the Federal Government establish a national board of health, first broached officially in 1872, northern sanitarians turned a more sympathetic ear. Even here they proceeded cautiously, however. Both the American Public Health Association and the American Medical Association discussed the advisability of petitioning Congress for a national sanitary bureau, but finally decided that the proper time for its establishment had not arrived. In 1874 Henry I. Bowditch recommended that the best policy for the medical associations was "to urge the formation of State Boards of Health for each State. When that is done, and when they have been in operation a certain number of years, and have become an organic necessity for each state, then, and not till then, can a Nation-

\textsuperscript{26}American Medical Association Transactions, XXX, 1879, p. 324.
al Council work efficiently. About two out of every three sanitarians were in agreement with this viewpoint.28 Yet five years later, in 1879, the National Board of Health was established — born "prematurely," as one of its members asserted.29 Several factors contributed to its creation at this particular time. The 1870's was a decade of centralization of public health administration the world over — witness the comprehensive English Public Health Act of 1872, the creation of the Imperial Health Board of Germany in 1875, and the establishment of the French Commission on Public Hygiene in 1879. New engines of industry were destroying both time and space, bringing together into a closer union those geographical regions formerly isolated and distant. Whether or not this welding process had proceeded far enough in the United States in 1879 to justify a centralized health bureau found few questioners; it was enough that the people firmly believed that the country was now interdependent in matters of


28 For correspondence of well-known sanitarians from all sections of the country on this question, see American Medical Association Transactions, XXVI, 1875, pp. 303-305.

health as well as wealth. This counted for more than the constitutional argument invoked by opponents of the National Board — an argument that sanitarians instantly dismissed by pointing out that epidemics destroyed commerce, and "to say that the power of Congress over commerce could not be exercised to save commerce itself would seem to be absurd." 30 Also, by now national legislation in health matters could satisfy those two necessary conditions of all Federal activity — national interest and practica-

ity. 31

But it was yellow fever that supplied the immediate and most cogent reason for establishing the National Board of Health. The epidemic of 1878 had not only caused untold grief and suffering through loss of life; in addition it had engendered a panic which ended in shot-gun methods of quarantine and a complete paralysis of trade. The resulting economic losses were no longer felt by only the section afflicted. Because of the close-knit economic fabric of the nation the effects reached all corners of the business world.

Those communities that formerly had opposed national quarantine, located mostly in the Northeast, began


31 Ibid., 66.
to glimpse the desirability of a regulating authority. The disclosure that the presence of yellow fever in New Orleans had been concealed by the local board of health gave point to this need; local unwillingness to brand its own community as a center of dangerous infection made it imperative for public safety to have a higher authority to announce such facts.\textsuperscript{32} And once an epidemic had started, the evil consequences of unsatisfactory quarantines by the "irresponsible boards" of every country town or crossroads, "wholly indifferent to protect the public health, but destructive of trade and prosperity, plainly pointed to the necessity for a National Board of Health.\textsuperscript{33}

In the spring of 1878, even before the yellow fever epidemic got under way, Congress had finally passed a quarantine act, so weakened by amendments that it possessed little real power over state regulation.\textsuperscript{34} The intention of the bill was completely nullified by the failure of Congress to appropriate any funds to carry out its provisions. The tragic epidemic of the following months brought a changed attitude, both among the general public

\textsuperscript{33} Appletons' Annual Cyclopaedia, 1879 (New York, 1885), XIX, 466.  
\textsuperscript{34} Statutes at Large, XX, 37-38.
and in the halls of Congress. A private commission, financed largely through the generosity of a New York woman, was organized to investigate the character of the disease and to find means of preventing its spread, and a few months later Congress followed suit by appointing a joint commission of its members to study the same problem. In his message to Congress the next December President Hayes declared that the "public sentiment in favor of national sanitary administration," not only to control external quarantine but to regulate "the sanitary supervision of internal commerce in times of epidemics," demanded some action from the legislature. In February 1879, shortly after the Congressional commission reported that in its opinion the disease was not indigenous but imported, several bills "to prevent the introduction of contagious and infectious diseases into the United States, and to establish a bureau of public health" were introduced

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35 For an instance of the increasing popular interest in health protection and of a movement to have Congress investigate the nature of yellow fever, see New York Tribune, November 22, 1878, p. 5; also, "Memorial for National Board of Health," Boston Medical and Surgical Journal, XCI, 1878, p. 609-610.

36 Congressional Record, 45 Cong., 3 Sess., 1878-1879, VIII, Part 1, p. 3.

37 Senate Reports, 45 Cong., 3 Sess., 1878-1879, II, No. 734, p. 2.
into both the House and the Senate. The bill of Senator Isham G. Harris of Tennessee, creating a director-general of health as executive officer of a bureau of health, became the focal point for debate. Strong opposition by Senators representing eastern commercial interests, who objected to placing so much power in the hands of one man, blocked its passage. In the last minutes of the session, however, another bill which provided for a health board of eleven members was passed. A national sanitary bureau was at last an actuality.

The Constituting Act creating this "premature" board provided for eleven members; one medical officer each from the Army, Navy, and Marine Hospital Service, a representative from the Justice Department, and seven representative physicians from as many different states, appointed by the President. The members served without sal-


39 Sanitarians in general preferred that Federal control be exercised by an executive committee, with the secretary as "mouthpiece," to a one-man dictatorship. See Billings, "National Board of Health," loc. cit., 47-48. Some jealousy of the new board was displayed by the Marine Hospital Service, which had been invested with control of quarantine in the abortive bill of 1878 and which had since 1876 been recommending a national system under its control. See Boston Medical and Surgical Journal, 0, 1879, pp. 67, 403; Statutes at Large, XX, 38.
ary, although their expenses were paid.\textsuperscript{40} Of the better known men in sanitary science on this first board were James L. Cabell, Stephen Smith, Henry I. Bowditch, and John S. Billings of the Army Medical Department.\textsuperscript{41}

The duties of the new agency were purely investigatory and advisory. As one of its first acts the board sponsored a commission of medical experts to go to Havana to study yellow fever at its source. The board also drew up precautionary measures to be taken by state and local officials should yellow fever once more threaten to become epidemic. The New York Tribune, for one, expressed great doubt of the effectiveness of this second action. It did not question the sanitary wisdom of the board members, which "certainly should be trustworthy," but feared that the "cordon" around infected vessels advocated by the board would not work under local or even state supervision in this "free republic where all are officers and none privates."\textsuperscript{42} Unless the board were clothed with greater

\textsuperscript{40}Statutes at Large. XX, 484-485.
\textsuperscript{41}The homeopathy school of medicine, which had strong backing in some Washington quarters, exerted considerable influence to have one of their numbers appointed to the Board. Tullis S. Verdi became their representative on the national health board. T. S. Verdi, "Congress and Homoeopathy," United States Medical Investigator: A Semi-Monthly Journal of the Medical Sciences (Chicago), n.s., IX, 1879, p. 403.
\textsuperscript{42}New York Tribune, May 14, 1879, p. 4.
authority to carry out its suggestions, the Tribune warned, the South might again have to resort to shot-gun quarantine. To a very slight extent this was remedied a few weeks later, on June 2, 1879, when Congress enacted a quarantine act which gave to the board its first real power.43

The terms of this later act required all ships arriving at a United States port to have a bill of health made out by the consul from their port of departure. The National Health Board was assigned the task of framing rules and regulations to be observed by these incoming vessels, and of publishing the weekly abstracts of consular reports on sanitary conditions in foreign nations. But principally the board was directed to aid the local and state health officials in enforcing local quarantine laws and, under certain circumstances, to give financial assistance to states when and where needed. Upon the request of the President the board was also empowered to make quarantine regulations where local efforts were inadequate, and when state authorities refused to execute such regulations, to detail an officer to enforce them.44

43 The Marine Hospital Service had formerly performed these duties, and its consistently hostile attitude toward the Board can be attributed to its resentment over the transference of some of its functions to the new board.

44 Statutes at Large, XXI, 5-7. Power to erect quarantine buildings and other minor extensions of authority were given to the board in an act passed a month later. Ibid., 46-47.
Almost before the board members had time to become acquainted with each other yellow fever once again made its appearance at New Orleans. By June it had started up the Mississippi Valley and by mid-summer it threatened to reach the tragic proportions of the severe attack of the preceding summer. Memphis, Tennessee, for the second time, became its chief victim. Deaths soon mounted into the thousands and half the population fled the city, much to the uneasiness of the neighboring communities to which they moved.45

The National Board attacked the problem as promptly and as best it could with its limited medical knowledge. Representatives of the board, headed by John S. Billings, went at once to the center of the infection to confer with local officials to see what measures could be taken. A system of river quarantine boats was devised, and Federal inspectors were employed to supervise and to advise local officials concerning the best methods of quarantine. In the light of today it may be seriously doubted whether the activities of the board appreciably abated the progress or severity of the disease. Neverthe-

45 The National Board of Health first heard of the Memphis epidemic through reports in the newspapers. Since the board had decided at one of its first meetings not to give out information to the press regarding its activities, the New York Tribune felt this situation had its ludicrous side. New York Tribune, July 12, 1879, p. 1.
less, the fact that such a National Board existed and that it was taking steps to check the disease proved reassuring to the people and allayed fears somewhat.

The whole nation, as it had the year before, extended its sympathy to Memphis, twice desolated by this scourge within two years. More useful than money or sympathy would be a "little commonsense in towns not yet attacked" and a great deal more sanitation, the New York Tribune had asserted after the first epidemic. Memphis itself concurred in this verdict. "We've all been heroic," commented a local editor, "now we've had enough of heroism; let's have drainage." In 1879 the National Board took steps to give them the drainage they wanted and needed; some of its funds together with the sewage expert, George E. Waring, were sent to Memphis to build a drainage system. This sanitary improvement, it was generally believed, would go far toward averting any repetition of the recent calamity.

46 Ibid., September 16, 1878, p. 4.
47 Quoted in ibid., November 22, 1878, p. 4.
48 Waring, who for long had advocated separate drains for sewage and surface waters, now had a chance at Memphis to try out his theories. Although much cheaper to install, both the construction and the system soon proved imperfect. For a criticism of Waring's installation at Memphis, see Robert Moore, "On the Sewerage of Kansas City," Journal of the Association of Engineering Societies, III, 1884, pp. 67-75.
It was extremely unfortunate that the first problem handled by the board had to be the Memphis epidemic. It was not a fair test of the board's true worth. Without real authority to deal with interstate quarantine, it could only advise state and local boards on suitable procedures to adopt. Yet the public in general judged the board by its quarantine activities in the yellow fever epidemic, and considerable disappointment was expressed throughout the nation at the "halting and vacillating" policy of the board. The public longed for some dramatic action, like isolating every case of yellow fever. Very few persons realized the limited powers belonging to the board, and explanations issued by the board concerning these limitations were more than counteracted by the false impressions fostered by Washington newspaper reporters. Those journalists, by their impatient and sharp criticism, tended to heighten the general misunderstanding of the character

49 John S. Billings in American Medical Association Transactions, XXXI, 1880, pp. 452-453; Appletons' Annual Cyclopaedia, 1879, XIX, 467.

50 Appletons' Annual Cyclopaedia, 1879, 467.


and purpose of the board. 53

Competent and fair-minded observers felt that for the most part the board had made the best showing possible with powers no "more effective" than those of a "voluntary organization of doctors and medical officers." 54 With ill-defined authority, laboring in a field where no precedents existed to guide it, the National Board had to depend on local or state boards to carry out any suggestions it made. In the main it received excellent cooperation from the state boards, which were "eager" to avail themselves of whatever help the National Board could give them. 55 Yet favorable conditions for establishing nationwide uniformity in health regulations did not prevail, for not only were health boards lacking in many communities, but also most existing boards were inexperienced and inef-


55 *Nation*, XXIX, 1879, p. 124. The health and quarantine regulations drawn up by the National Board were adopted by Illinois, Kentucky, Mississippi, New Jersey, North Carolina, Tennessee, and Texas, as well as by local boards in Georgia, Louisiana, Alabama, South Carolina, and Missouri. William Dowe, "The Science of Public Health," *National Quarterly Review*, XLI, 1880, p. 188.
In an effort to increase the efficiency of the board its friends in Congress sponsored numerous amendments to get around the states' rights stumbling-block. Although influential portions of the medical profession supported these attempts, opposition to the board prevented any enlargement of its functions. It remained principally an investigatory agency, with the additional duty of instructing the public in health matters.

To take care of this last chore the board issued a weekly bulletin on health conditions throughout the country, together with other sanitary advice. As a source of health information the bulletin soon became indispensable to local health officials. According to one contemporaneous observer, its influence with the general public was also considerable, teaching the people "the difference between dirt and filth," so that "instead of resting satisfied with superficial cleanliness," they began to seek "to eradicate the hidden evil."
For a very short time — scarcely more than a year — that may have been true, but with the disappearance of yellow fever the public's interest in the National Board quickly waned. Most persons had expected and looked for brilliant immediate results. When these were not forthcoming the scientific investigations of the board failed either to attract their support or to hold their attention. Even as early as the winter of 1879 one critic of the board announced with assurance that the interest in national health boards had subsided, and offered as corroborative evidence the fact that eastern newspapers had paid but passing attention to the proceedings of the last convention of the American Public Health Association.\(^5^9\) This neglect on the part of the newspapers was admitted by the press itself; the continuous newspaper agitation so necessary to maintain the people's interest in health and sanitary reform was absent by 1800, confessed one paper.\(^6^0\)

\(^{59}\)Boston Medical and Surgical Journal, CI, 1879, pp. 853-854. This writer criticized the board severely — and also sarcastically. He claimed that the board was too big for efficiency, therefore had had to delegate its powers to five men, one of whom finally made all the decisions. He also recounted several mistakes committed by the board in the yellow fever epidemic, and characterized the reports of its sanitary inspectors, with a few exceptions, as being silly and totally without value.

\(^{60}\)See New York Tribune, August 10, 1881, p. 4.
Congress, when it created the board, had appropriated more than half a million dollars to finance its operations. By the end of 1882 most of this sum had been used up and the board had to ask for additional funds to continue its activities. However, its enemies in Congress were now stronger and more numerous than its friends. In addition, the ruling sentiment in Washington was opposed to all Federal administrative boards. Every interest in the nation thought it should be represented in Washington by a centralized board, protested one Senator, whereas what was really needed was legislation repressing them instead of sustaining them. The National Board of Health became one of the first agencies to fall victim to this hostile attitude. Not only did Congress fail to reenact the Quarantine Act of June 2, 1879, which automatically expired at the end of four years, but it also specifically restricted

61 In the first three years the board expended $506,216. Roughly, it was allocated as follows: $100,000 spent for maintaining a floating quarantine on the Mississippi River; $13,000 for the expenses of the Havana Yellow Fever Commission; $30,000 for special scientific investigations; $100,000 for aid to the local and state health boards of Tennessee, Illinois, Mississippi, Arkansas, and Florida. The rest went for salaries, rent, light, fuel, pay of employees, maintenance of refugee stations, etc. Report of the National Board of Health, 1882, 45-46.

62 Garner, "Federal Activity in the Interest of the Public Health," loc. cit., 194. For other Congressional objections to the board, see Boston Medical and Surgical Journal, CII, 1880, pp. 617-618.
the duties of the National Board to the investigation of three diseases, namely, yellow fever, cholera, and smallpox.

Before this blow fell, most of the more active and better known members of the board had already resigned. For a few more years the board continued to drag out a drastically curtailed existence. In 1886 its remaining duties were transferred to the Marine Hospital Service and the National Board of Health belonged to the past.

The constitutional structure of the Federal Government, with sovereignty over public health still vested in the states, prevented the founding of an efficient or authoritative board. The agency created in 1879 was not an ideal board, but it was perhaps the best that could be devised for the United States at that time. The task facing it was also most difficult. It was not enough to show how wholesome food, pure air and pure water, and exclusion of infectious diseases could be obtained; it also had to show how these things could be secured with the least possible interference with the citizen and his rights. 62

Neither the good it accomplished nor the ideal it represented died with it, however. Although it did not live up to the expectations of its followers, and though its preventive measures against yellow fever proved of

small value and its medical investigations added little new knowledge to sanitary science, yet the board left its mark on the future development of the public health program. By its example and advice it stimulated the younger cities of the West to inaugurate sanitary improvements at a time when such changes could be accomplished with comparative facility. The standards it set up proved a helpful guide to inexperienced members of state and local health boards, and the adoption of its rules and regulations by most state and numerous local boards introduced a degree of uniformity where chaos had prevailed before. Indicative of its influence in this direction was the proposal to hold a meeting of all state boards of health at Washington in May 1884 to talk over their common problems.

There was still another reason advanced for holding this Washington meeting. It gave the state health officials an opportunity to confer with their Representatives and Senators for the purpose of urging further national sanitary legislation. This ideal of Federal supervision

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66 Ibid.
of public health kept recurring year after year. Some progress in this direction was made before the turn of the century. In 1890 national quarantine regulations no longer had to conform with state regulations, and in 1893 the first maritime quarantine law was passed. A national sanitary bureau still remained the goal of all sanitarians, however, and periodically attempts were made to establish such a department of government. After the collapse of the first Federal health board, such schemes had to wait until the next century for fulfillment.

The failure of the National Board of Health can be attributed for the most part to the medical ignorance of that day regarding the etiology of disease. Even as the board was fading into oblivion, discoveries were being made in Europe that soon were to change radically the science of sanitation and in time to revitalize and reorient the public health movement. As the sanitarian of the 1880's learned more of these remarkable discoveries, new and more wonderful visions unfolded before his imagination.

Chapter VIII

THE GERM THEORY

The remarkable achievements of Pasteur, Koch, and others in the 1880's opened up new avenues of attack against age-old enemies. This knowledge, of course, could not be immediately applied to the practical problems facing the sanitarian, but the implications of these discoveries were grasped by most sanitary scientists and the more progressive physicians of America.

Although not new, the germ theory had been generally discounted in the first half of the nineteenth century. Then it began to gain fresh converts — slowly at first, for the belief in "miasms" and the "predisposing" factor of atmosphere and environment had become firmly intrenched in both the lay and medical mind. Therefore, in many quarters the germ theory encountered stiff resistance.

In 1871, for instance, an advocate of the germ theory was severely taken to task by the Scientific American for expressing the opinion that yellow fever was caused by "living organisms of inconceivable minuteness." This was "too liberal" a use of the imagination. The visions of modern science, scoffed the magazine, were "more
wonderful than the visions of Eastern fable.¹ Such sar­
casm was not confined to non-medical critics. Dr. George
Derby, in the second annual report of the Massachusetts
Board of Health, complimented one paper on "Air and some
of Its Impurities" for its substantial service of checking
"the exuberant imaginations of many about 'organic germs,'
of which we have heard so much the past year."²

But the germ theorists were not to be stilled by
these attacks. In a remarkably able paper read before the
first convention of the American Public Health Association,
Professor F. A. P. Barnard of Columbia University convinc­
ingly reviewed the recent observations and facts which sub­
stantiated the germ theory.³ The yellow fever epidemics
of the 1870's strengthened the case for this hypothesis of
the origin of disease; how else could one account for the
spread of yellow fever, which passed "from house to house
with the regularity of a postman, at the rate of about 40
feet a day," unless the infection was living and could
grow and increase outside the body. "The old farmer's

¹Scientific American, XXIV, 1871, p. 246.
²Second Annual Report of Massachusetts Board of
Health, 1871, 15-16.
³F. A. P. Barnard, "The Germ Theory of Disease and
Its Relation to Hygiene." American Public Health Associ­
ation, Public Health: Reports and Papers, I, 1873, pp.
70-87.
remark that 'Yellow Jack can't go anywhere unless you tote him' is quite true for distances of a few miles, but for a few squares only he seems to be able to get along without assistance.\textsuperscript{4}

During the epidemics of 1878 and 1879 the conviction that a germ was the cause of yellow fever became very widespread.\textsuperscript{5} But outside the fact that this germ was a living organism the layman's guess was as good as the physician's concerning its true nature. The opinion of the National Board of Health carried the most scientific weight, yet it must be admitted that the Board spoke with more assurance than the facts at its disposal warranted. In its instructions to the stricken areas it confidently said:

"When the germ of yellow fever is dry or partially dried, no gaseous disinfectant can be relied on..."\textsuperscript{6} It then advised that the germ should be moistened before applying disinfectant, but how a person was to determine the degree of dryness of the germ was not explained. As for lay opinion of what germs were like, it was apt to take any tangent.


\textsuperscript{6}New York Tribune, July 30, 1879, p. 1.
For instance, one protest was lodged against laying steam pipes under the streets, for it released the germs that nature intended to "freeze" throughout the winter, and fear was also expressed that constant digging would distribute malaria germs "from the upturned ground."\(^7\)

Whether the germ theory or the older chemical theory was nearer the truth at first made little difference to the practical program of the sanitarian. In either case the fight against filth must continue, for "the causes, whatever they may be, will be found in surrounding conditions."\(^8\) Thus, pure air and water, wholesome food, sewerage, enforced cleanliness, prevention of "crowding," disinfection, and an efficient sanitary police remained the goal of the sanitary scientist.

The results already achieved by this type of program, measured in terms of the mortality rates between 1860 and 1880, might well encourage the American sanitarian. In all but a few cities the death rate had fallen from approximately 25 to 40 per thousand persons to around 16 to 26 by the end of the seventies. Only a few cities now admitted having a mortality rate above 30. Of the larger cities

\(^7\)Sarah G. Young, "Municipal Grievances," American Architect and Building News (Boston), XXII, 1887, p. 218.

these were New Orleans, Charleston, Savannah, Newark and perhaps Memphis, most of them in the South where sanitary arrangements were notoriously inferior. This trend toward lower death rates did not falter in the 1880's. Cities constantly called attention to the healthful record of their community; Chicago, for instance, proudly announced in 1887 that her death rate had decreased from 25.69 in 1881 to 18.76 and 19.43 in 1885 and 1886 respectively.11

Other, if more intangible, signs pointed to an improvement in the nation's health. The testimony of contemporaneous observers lacked the extreme pessimism heard so often heretofore. Travellers still noted "the many worn and pallid faces" in America, to be sure, but this


10See the mortality table in Frederick L. Hoffman, "American Mortality Progress during the Last Half Century," in Mazzyck P. Ravenel, ed., Half Century of Public Health, 102. It is interesting to note that a bad epidemic in modern times, the influenza outbreak of 1918, only raised the mortality rate of Philadelphia, a city that was particularly hard hit, to 23.9. Death rates during epidemics of as high as 100 persons per thousand had not been rare before 1850. Ibid., 104.

characteristic no longer seemed so prevalent.\textsuperscript{12} Other criticisms seemed equally mild. A report that Secretary of State Blaine had placed himself in the hands of the trainer Muldoon brought to light the fact that very few men in public life gave "either time or thought to bodily exercise."\textsuperscript{13} More concern was expressed regarding the women, who by donning the "fashionable corsets" of the day — instruments of torture that reduced their waists as much as ten to fifteen inches — threatened to make chronic invalids of themselves.\textsuperscript{14}

On the other side of the ledger, significantly enough, many writers noted a great improvement in the American health and physique. One witness who had been familiar with Boston and New York for fifty years observed that, by the 1890's, American men were more robust and erect, the women improved in feature and carriage, and in Boston's streets one could now see "a hundred good-looking women" where formerly it was difficult to locate even one.\textsuperscript{15}

\textsuperscript{12}Georgius [pseud.], Some Observations on the Physical Welfare of Our People (n.p., c. 1892), 33.
\textsuperscript{13}Ibid., 37.
\textsuperscript{15}F. J. Kingsbury, "Tendency of Men to Live in Cities," Journal of Social Science, No. XXXIII, 1895, p. 15.
Of the cities and towns which now housed one-quarter of
the population, it could almost be said — as it was often
said of England — that life in the city was on the whole
more healthful than it was in the country.\textsuperscript{16} Certainly
that was to come true with the passing of but a few years,
when more often than not the rosy, healthy country type of
literature and tradition would more often be found among
the city-bred or city-raised.\textsuperscript{17} Finally, even more con­
crete proof that the American physique had improved was
not lacking. Dealers in ready-made clothing found it nec­
essary in the 1880's to adopt a larger scale of sizes and
many more sizes to accommodate a customer who had grown
larger.\textsuperscript{18}

Only a part of this improvement can be credited
to the public health program, of course. Although mortal­
ity rates in the cities had declined and many important
health reforms had been introduced, a cursory survey of
several leading cities in 1885 disclosed that widespread

\textsuperscript{16}Charles F. Wingate, "Health of American Cities,"
Tenth Census of the United States, 1880, Mortality and

\textsuperscript{17}Kingsbury, "Tendency of Men to Live in Cities,"
loc. cit., 15.

\textsuperscript{18}Arthur M. Schlesinger, The Rise of the City, 1878-
1898 (New York, 1933), 432-433.
sanitary abuses still existed. For example, the health officer of Philadelphia reported regretfully that most houses in that city stood "in bad soil a foot deep." Cincinnati, it was declared, had long suffered from the inefficiency of a health board composed of one physician and five saloon-keepers. Only one-sixteenth of the city was sewered. In Louisville none of the houses were connected with sewers; Chicago contained thirty-six miles of unsewered street; while 75,000 persons living in St. Louis had no sewerage facilities whatsoever. In this latter city one-half of all plumbing was defective, and execrable plumbing was reported as an outstanding sanitary defect in Providence, Detroit, Toledo, Yonkers, Pittsburgh, Indianapolis, Atlanta, and Wilmington, Delaware. In Hartford, Connecticut, a sluggish, refuse-filled stream passed through the heart of the city and contributed in great measure to the "murderous" mortality rate of 37 per thousand. At the dedication of a costly monument to the Civil War dead in 1884, the sanitary situation of the city drew Mark Twain's wrath. He remarked that although great honor was due to the brave men who went to the war, "perhaps even more was due to those who remained at home and risked their

20 Ibid., 94-97.
lives daily, as he did, in passing the Park River sewer. \(^{21}\)

Although the sewer facilities of almost every city were decidedly unsatisfactory in the 1880's, most communities were constructing or had plans afoot to install adequate sewers. \(^{22}\) The principal stimulus to this development was the rapid growth in public water supplies, because after introducing large quantities of water into the city means were needed to carry it out again. \(^{23}\) Prior to 1860 there had been only sixty-eight water works. This figure had increased to 629 by 1880. Eight years later there were 1,598; in 1890 more than 2,000; and by 1897 this had jumped to 3,196. \(^{24}\) New York, Boston, Chicago and the other larger

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\(^{22}\) In the 1880's the lower cost of the Waring system of "sanitary" sewers made it possible for a great number of smaller cities, towns, and even villages to install such systems, thus deriving "sanitary benefits." William P. Gerhard, "A Half-Century of Sanitation," American Architect and Building News, LXIII, 1899, p. 67.

\(^{23}\) One worry among engineers and sanitarians was the wasteful use of these water supplies. Not until the 1870's did cities introduce the water meter and exact a charge from each user. Some sanitarians condemned this practice, except for breweries and other similar businesses. They felt that instead of restricting the use of water by charging for it, every effort should be bent to attain a wider distribution of more pure water. See C. F. Chandler, "Water Supply of Cities," American Public Health Association, Public Health: Reports and Papers, I, 1873, pp. 559-560.

cities found it necessary to expand their water systems to take care of the great influx of population into their confines. It was in the 1880's that anxiety began to be expressed regarding the purity of the water, and that the Massachusetts Board of Health inaugurated its valuable experiments and studies on filtration.  

The cleanliness of streets, despite improving means of refuse disposal, still remained a perennial complaint of New York newspapers. The New York Tribune, at the beginning of the decade, protested unhappily at the fact that "germs of almost every disease" could be found in the city's streets, its one consolation being that in Philadelphia conditions were even worse. Most alarming of all, these germs were conveyed to the citizen's stomach by the meats and vegetables he bought in the markets. "Let no man call himself happy over his spring lamb and mint sauce; they are only wolves in disguise; typhus may hide its pallid face in an ice, or smallpox lie perdù in a strawberry."  

25Harper's Weekly ran a number of illustrations of the pollution of the Croton water supply and suggested that temperance societies, "which insist we drink water, commence an energetic campaign in the interest of pure water for all." "The Water Supply of New York," ibid., XXV, 1881, pp. 348-350. For a rebuttal of some of the charges of this magazine, see "Purity of the Croton," Sanitary Engineer, IV, 1881, pp. 291-292.  

The tenement problem in the large cities was more pressing than at any time before. In Boston a survey at the start of the 1890's disclosed that 60 per cent of the population lived in airless, cheerless, and generally unsanitary tenements. Sleeping rooms with no outside windows numbered more than 3,500. As for New York, the limited area available for building purposes made the tenement problem particularly acute. The average number of persons per dwelling increased from 16.36 in 1880 to 18.53 in 1890 and 20.4 in 1900. The sanitarian was practically helpless to correct this situation, because a tenement house law of 1882 had been declared unconstitutional by the New York Supreme Court on the grounds that it had "no relation whatever to the public health." As tenements grew taller and...


28 Jacob A. Riis, The Battle with the Slum (New York, 1902), 89. One of the more serious dangers to human life of such crowding was that more than 50 per cent of all fires started in crowded tenements.

29 According to Theodore Roosevelt, this decision "completely blocked tenement-house reform legislation in New York for a score of years...." Quoted in Henry S. Commager, ed., Documents of American History (New York, 1934), 116. In the light of today it is interesting to note the argument of the court; "if it can be sanctioned...we will not be far away from those ages when governmental prefects supervised the building of houses, the rearing of cattle, the sowing of seed and the reaping of grain, and governmental ordinances regulated the movements and labor of artisans, the rate of wages, the price of food, the diet and clothing of the people, and a large range of other affairs...." Ibid., 117.
fuller and dirtier one sanitarian described New York as consisting of "nothing but misery piled up to heaven." 30

To these difficulties was added the indifference of the health board which, it was disclosed in 1885, had not received any sanitary reports regarding some districts of the city for more than five years. 31

The keen enthusiasm of the 1870's for sanitary science showed signs of diminishing in the eighties. Disillusionment in the effectiveness of health laws and health boards to abolish all unnecessary disease was unquestionably one reason for this slackening interest. Also, the "disappointedly" good health of the inmates of the most unsanitary of dwellings destroyed faith in "filth" as the originating cause of disease, and the answer that such examples "go to show how much the human constitution is often capable of enduring" failed to solve the paradox or to satisfy the scientific mind. 32 The opinions of sanitarians, instead of being in substantial agreement as they had been in the seventies, began to diverge. A meeting of


32Report of the National Board of Health, 1880, 523-524. This puzzling phenomenon — if filth caused disease — had been commented on many times before.
hygienists to determine the cause of a typhoid fever outbreak at Port Jervis, New York, in 1883 produced as many theories as speakers. Even if such meetings did tend to promote "a practical acquaintance with the rudiments of sanitary science...helpful to individuals and communities," as the New York Tribune asserted, they must also have confused the public regarding proper hygienic precautions.

Fortunately the new science of bacteriology soon came to the rescue. The true germ theory may be said to have begun in 1877 with the publication of Pasteur's paper on anthrax. The following year saw the introduction by Koch of solid media for growing bacteria cultures. This method made bacteriology an exact science, for it displaced the former liquid culture which even in the most skillful hands gave conflicting results. Other laboratory improvements were quickly devised. Aniline dyes, it was discovered, could be used to stain the bacteria in order to distinguish them, and they would retain this color even after a reagent had been used to decolorize the animal tissue and other material in which they existed and multiplied. The addition of Abbé's illuminator, an instrument attached to


microscopes in order to obliterate refraction outlines, brought these minute forms of life into clear focus for the first time. The scientist could now isolate a specific bacterium and study its life cycle without danger of confusing it with other elements in this new, marvelous world under his microscope.

After 1880, scientists all over the world trained their microscopes on the disease-producing organisms of common human ailments, and in the first ten years of hurried search for the isolated bacillus of specific diseases one announcement followed after another. The typhoid, diphtheria, tetanus, tubercle, and cholera bacilli, and the pneumococcus and streptococcus were identified. The science of bacteriology blossomed overnight, and, as Harvey Cushing has so aptly phrased it, "new discoveries were being announced like corn popping in a pan."35 It was a decade signally marked by its achievements in the department of etiology.

In America the new science lagged behind the work being performed in Europe. Professor Thomas J. Burrill and Drs. William H. Welch, T. Mitchell Prudden, Daniel E. Salmon, and George M. Sternberg began to initiate studies in

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35Quoted in C.-E. A. Winslow, Life of Hermann M. Biggs, 60.
bacteriology in the late seventies, but in general exact knowledge of the new science was not widely known in America before 1885. Five years later, however, this ignorance had been largely corrected, and Americans soon were making notable contributions to bacteriology.36

Curiously enough, both the germ theory and the discoveries of European bacteriologists gained acceptance from laymen (if one can judge from the newspapers and lay periodicals) more quickly than from the medical profession.37

36 Gorham, "History of Bacteriology," loc. cit., 72-73. The term "bacteriology" seemingly was not used before 1884 and no courses on the subject were introduced into American colleges until that same year. The lag in the development of this new science was due principally to the difficulties of working out suitable techniques of research. Edwin O. Jordan, "The Relations of Bacteriology to the Public Health Movement Since 1872," American Journal of Public Health, XI, 1921, p. 1044. There was no book in the English language on the subject until Edward E. Klein's little work Micro-Organisms and Disease in 1864. The first American book appears to have been Thomas E. Satterthwaite's Introduction to Practical Bacteriology (1887). George M. Sternberg's Manual of Bacteriology was not published until 1892. Joseph MoFarland, "The Beginnings of Bacteriology in Philadelphia," Bulletin of the Institute of the History of Medicine, V, 1937, p. 151.

In fact, it was "astonishing" how few medical men in the early eighties were willing to accept the implications and procedures of Pasteur's work, and "the general sentiment of the profession remained hostile."38 Indicative of this reluctance on the part of the medical profession is the fact that few if any references to the modern germ theory appeared in the Massachusetts Board of Health reports until 1885, long after the lay press had discussed the new theory pro and con.39

As early as June 6, 1881, the attention of the readers of the New York Tribune was called to the remarkable medical researches of Pasteur and others on immunity and pathology, and "great expectations" were "entertained of the final results...."40 Six months later this same newspaper, in an editorial, pointed out that the germ theory was receiving more and more confirmation, and that scientists, by growing germs and "domesticating" them, hoped that the infant of the future would be vaccinated with "cultivated" measles, mumps, whooping cough, and scarlet fever.41

38 Winslow, Life of Biggs, 72-73.
39 George O. Whipple, State Sanitation, I, 74.
40 New York Tribune, June 6, 1881, p. 5.
41 Ibid., December 11, 1881, p. 6.
Comment in the magazines of that day favorable to the germ theory and immunization can be found as early as 1881. Each acute disease is caused by a specific organic germ, one writer in the *North American Review* explained to his wide audience, and "the great curative remedies of the future will be antidotes and eliminatives for their destruction or expulsion." Both *Science* and *Popular Science Monthly* watched and commented regularly on the growing progress of the germ theory, while John S. Billings, in a report on the International Medical Congress of 1881, printed in the *International Review*, emphasized the direct practical value of the germ theory to the sanitarian — "important because the germ can now be avoided or tracked down and destroyed."

Although the medical profession as a whole may have been slow to appreciate the importance and truth of the new germ theory, many of the younger physicians embraced its principles with enthusiasm. The full import of the new discoveries was grasped at once by many recent


medical graduates, such as Hermann M. Biggs, who hailed the announcement by Koch of the tubercle bacillus as the "grandest discovery of the age." Yet, medicine was only at the beginning of a long trail. None could be sure where it led. As the awesome possibilities of a world dominated by unseen, innumerable germs began to be understood, the wonder seemed to be, exclaimed one sanitarian in the early eighties, not that so many people died, but that so many were left alive.

Despite some confusion arising from the misuse of the term "germ," the prevailing opinion held that there were "many kinds of microphytes" and that each had certain special powers and could only propagate its own kind within a certain limited time. The task of curative medicine, as differentiated from preventive medicine, consisted of reaching and destroying these living organisms after they had entered the body, and at first any means to accomplish this, however strange, was tried. But the most promising

45 Winslow, Life of Biggs, 43.
47 Ibid., 341, also 388.
48 Some of the methods for foiling the newly discovered germs were bizarre if not effective. For instance, in elephantiasis they found that the responsible germ, filaria sanguinio, was only present in the blood stream at night;
line of attack was by inoculation with an artificially modified virus, and it was to the perfection of this method that Pasteur directed his genius.

If such inoculation could render harmless the germ already in the body, could it not also make a person immune to attack? Immunization by inoculation, could it be attained, would provide sanitarians with a powerful, almost perfect weapon against many diseases. Perhaps that explains in part their propensity to accept the theory of vaccination and inoculation, in marked contrast to the opposition of physicians and medical scientists. The latter's criticisms often were based on sound scientific reasons, such as the cautious objections of Koch, but just as frequently they were grounded on inconsequential, tangential arguments. An instance in point was the rejection by one noted professor of the results of all bacteriological experiments because these experiments were performed on rabbits, and "the rabbit is a melancholy animal to whom life is a burden and who only asks to leave it."\(^49\)

in the daytime it collected in the lungs and lymph channels. Therefore, they tried keeping the patient awake at night and allowing him to sleep in the daytime, hoping to confuse the germ. Unfortunately the *filaria sanguinio* reversed his habits as easily as the patient and could now be detected in the bloodstream of the daytime sleeper. Ibid., 389. Cf. Report of the National Board of Health, 1883, 184.

\(^49\)Billings, "Germs and Epidemics," *loc. cit.*, 388.
As late as 1885 the scientific world was still uncertain whether the disease germ was a different entity from the usually harmless micro-organisms, or the same organism made abnormal by some unusual circumstance of the environment. The latter hypothesis, more than any other error, tended to retard the progress of the germ theory, asserted one scientist. Each disease is due to a separate species of bacteria, he insisted, and putrefaction and filth of themselves could not cause disease.

Even if no amount of filth could create cholera or similar diseases, in the eyes of the practical sanitary it still furnished the conditions for the spread of disease. Germs were the specific cause; they must be found and destroyed; but their most logical hiding place was where filth prevailed. Soon the odor of carbolic acid hung heavily in the air as the search got under way, and elaborate methods of disinfection were devised. The dangers of sewer gas, so dreaded at the beginning of the

52 O. W. Wight, Maxims of Public Health, 126.
decade, began to be discounted as producers of disease, and unpleasant sights and smells were now to be avoided for the sake of public comfort alone. The full importance of the germ theory became even more apparent when the new bacteriological technique was applied to practical problems. The microscopic studies of the water supplies of Massachusetts by the state board of health disclosed to an interested public that taste and smell could no longer be relied upon as a judge of purity. Chemical analysis and interpretation were needed to reveal in water the lurking dangers to health. All this meant that from now on the public health program must rely more and more upon the scientific specialist and his instruments, and less and less upon the "commonsense" standard used in the past.

The public appeared perfectly willing to lean upon the scientist. By 1890 it had developed a "touching"

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55 Billings, "Sewage Disposal in Cities," loc. cit., 579. However, one sanitarian railed at length against the prevalence of body odor among Americans as being of great danger to public health. "A sponge-bath every morning is a necessity of decent living." Wight, Maxims of Public Health, 15.

56 Report on Water Supply and Sewerage, Part I, Examination by the State Board of Health of the Water Supplies and Inland Waters of Massachusetts, 1887-1890 (Boston, 1890), 535-538.
faith in the wisdom and unanimity of science. The medical profession shared in the trust and esteem bestowed on science in general; by the late eighties the profession was "in better favor with the public than ever before." Between 1880 and 1890 — "perhaps the most wonderful decade in the history of medicine" — a revolution in medicine took place. A new enthusiasm and youthful spirit was alive, born out of the discovery of the agents of infectious diseases — a spirit which stirred not only medical men but the lay public.

From now on less was heard of smallpox, cholera, and yellow fever, and more of diphtheria, consumption, and scarlet fever. Eradication of filth, while still a concern of the sanitarian, became secondary to the control of communicable diseases. The medical profession throughout the world embarked upon a determined and thrilling search for the specific causes of disease and their specific

remedies. To aid them they had all the modern facilities and appliances for insuring accuracy in the domain of scientific research. A significant turning point in the public health movement had been reached.

61 Nathan S. Davis, History of Medicine with the Code of Medical Ethics, 165.
Chapter IX
COMMUNICABLE DISEASES

Before 1890 the best defense against communicable diseases had consisted of cleanliness, both of city and of person. In fact, the fear of dirt had become so deeply ingrained by the nineties, complained the Nation and other journals, that it had degenerated into "mysophobia."¹ The medical discoveries of the eighties did not at once discredit this former empirical method of warding off disease. In one way this proved fortunate for the comfort of city dwellers. When cholera threatened New York in 1893, the city government carried through a program of cleanliness which rid the streets of the dirt and filth that for so long had disgraced the metropolis.² Yet, no matter how brightly New York sparkled after that much-needed bath, those measures alone would have been helpless to prevent the epidemic from gaining a foothold had they not been supplemented by an efficient health department. What distin-


guished the protective measures in 1893 from earlier regulations was the utilization of the new medical knowledge and its technique for detecting disease — the diagnostic laboratory.

Until 1890 smallpox had been the only communicable disease against which the sanitarian could employ a specific and reliable weapon. Even so, public health authorities, not altogether through their own fault, had failed to capitalize on this remedy to its full value. Massachusetts, to be sure, had passed a compulsory vaccination act in 1855, requiring the vaccination of all children before they reached two years of age, but the law was honored as much in the breach as in the observance. Maryland in 1864 followed this lead, instructing physicians to vaccinate all young children in the circuit of their practice. New York City, in its turn, had succeeded in persuading a large portion of its population to submit to vaccination, as had Providence, Rhode Island, and other

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3 Susan W. Peabody, *Historical Study of Legislation Regarding Public Health in the States of New York and Massachusetts*, 50. Householders or physicians were required by law to notify the board of health or the selectmen of any case of smallpox. Ibid., 47.

large communities. But such half-measures, though better than none at all, could not guarantee a community against an outbreak of smallpox.

Another early method of checking communicable diseases was by isolating the patient. This called for the construction of isolation hospitals, however, and few communities could bear the expense that this entailed. A law compelling every community to provide a "pest" house for smallpox cases had been passed in Massachusetts as early as 1701, and in the next two centuries other states enacted similar regulations. Nevertheless, only the larger cities by 1890 had well equipped hospitals for isolation purposes; even as late as 1900 there existed not more than twenty-five or thirty such hospitals in the whole nation.

5 Free vaccine was widely distributed and used as an inducement to vaccination. Compulsory vaccination of school children was almost universally adopted by 1890. Providence, Rhode Island, was particularly strict about enforcing this regulation.

6 Until the new science of bacteriology made diagnosis certain, it was not feasible to hospitalize each suspicious case of disease reported by physicians. In New York City between 30 and 50 per cent of the cases thought to be diphtheria proved upon bacteriological examination to be similar but harmless disorders. Hermann M. Biggs, "Report to the New York City Health Department on the Use of Bacteriological Examinations for the Diagnosis of Diphtheria," Medical Record (New York), XLVI, 1894, p. 321.

Usually the smaller villages set aside a tumbledown shack at the edge of town to which all suspicious cases were moved. Here, virtually unattended, the patient had to conquer cold and discomfort as well as disease. These pest-houses were still in wide use throughout the United States in the 1880's and 1890's. The following description, typical of many of these places, makes it clear that the pest-house was more to be dreaded than the contagious disease:

It is...a small low shed-like structure with a few poorly arranged rooms, or perhaps, a single room. It is not plastered and has no cellar, and is heated, or not heated, by a stove. The water supply is obtained from an out of door pump, and the plumbing consists of an iron sink. The furniture usually corresponds.8

Was it any wonder that patients and their families tried to hide the disease from the authorities, in order that the sick person might not be condemned to the pesthouse.

In many villages the treatment accorded victims of cholera, typhoid or smallpox was even more inhuman. On a cold January day in 1864 the residents of one Minnesota town — much to the indignation of the surrounding communities — moved a smallpox case to a rude, unheated shelter outside town, where the patient quickly died.9 As late as

8Charles V. Chapin, Municipal Sanitation in the United States (Providence, 1901), 607-608.

1879 the terrified inhabitants of one remote district where malignant diphtheria had broken out refused to provide care for the sick poor.  

Even when a community did have hospital facilities the sick often fought against being moved to them. In 1894 a Milwaukee mob prevented quarantine officials from taking a smallpox case to a hospital. The health officers, even with the support of twelve policemen, were worsted by the mob.  

And in Muncie, Indiana, ambulance attendants sent out to get a patient were shot and wounded. In cases similar to these, and when it was impossible to provide hospital facilities, health boards frequently stationed guards outside the infected houses to enforce quarantine.

By the 1890's the earlier emphasis on the general environment had shifted to the control of specific communicable diseases. Massachusetts had by that time made diphtheria and scarlet fever, in addition to smallpox, a "notifiable" disease, that is, one that required the doctor or householder to notify the health authorities of its presence. In almost all localities isolation and quarantine


12 Chapin, Municipal Sanitation, 502.
became more rigidly enforced. Disinfection had to meet new, stricter standards. Noticeable also was the marked increase of hospital facilities in the large cities — in New York the number of available hospital beds more than doubled between 1884 and 1894.13

But these improvements alone could not have succeeded in bringing communicable diseases under control. Before any intelligent program could be devised it was necessary to establish beyond the shadow of doubt how disease was transmitted, and this the new medical discoveries did. By 1890 it had been satisfactorily proven that communicable diseases were passed on by persons, either in actual contact or near contact, and not by decaying vegetables or foul sewer gas.14 Furthermore, at hand were the means for identifying the agents of disease — namely, the bacteriology laboratories now springing up all over the nation.

The universities in America established the first laboratories, but if the one at the University of Pennsyl-

13 New York Tribune, December 29, 1894, p. 6; see also William P. Gerhard, "Half-Century of Sanitation," American Architect and Building News, LXIII, 1899, pp. 75, 76; Peabody, Historical Study, 47; for examples of the type of contagious hospital in use and in process of construction see Chapin, Municipal Sanitation, 618-628.

14 As late as 1887 some of the staunchest supporters of the germ theory were still uncertain whether or not disease germs originated de novo by the decomposition of fecal matter. C.-E. A. Winslow, Life of Hermann M. Biggs, 66, 105.
vania can serve as a criterion, the equipment was both mea-
gre and crude.15 About 1885, a number of the medical col-
leges and agricultural schools added courses in bacterio-
logy to their curriculums. Bacteriology laboratories de-
voted solely to hygiene soon followed. The Marine Hospital
Service equipped such a laboratory in New York City in 1887,
transferring it to Washington in 1891; a hygienic labora-
tory was set up at Ann Arbor, Michigan about 1888; the Min-
nesota State Board of Health founded a smallpox vaccine
laboratory two years later; and the city health department
of Providence, Rhode Island, established a bacteriology
laboratory under Dr. G. W. Swarts in 1888.16 The most com-
plete and elaborate of these early hygienic laboratories,
however, was opened in 1892 at the University of Pennsyl-
vania, with John S. Billings as director.17 From here it
was but a short step to the diagnostic laboratories oper-
ated by municipal health boards, the first set up by New

15Joseph McFarland, "The Beginnings of Bacteriology
of Medicine, V, 1937, p. 158.

16J. W. Kerr, "Scientific Research by the Public
Health Service," Annals of the American Academy of Political
and Social Science, XXXVII, 1911, p. 271; James A.
Tobey, Public Health Law, 69; Winslow, Life of Biggs, 97.

17Fielding H. Garrison, John Shaw Billings: A Memoir,
278-279; Richard H. Shryock, "Origins and Significance of
the Public Health Movement in the United States," Annals
of Medical History, n.s., I, 1929, p. 653.
York in 1892, followed by Providence and Philadelphia in 1894.

These diagnostic laboratories can be considered "the most important step in modernizing public health practice in the United States." They sounded the death knell of the old fallacious ideas regarding "climate, season, hunger, thirst, food, pain, anger, ungratified sexual desire, etc., as predisposing or exciting causes" of disease. From now onward, certainty as to diagnosis, knowledge of the method of disease transmission, and serums and antitoxins became the new tools of public health workers.

Although the mortality rates for larger cities had shown a marked decline between 1860 and 1890, several communicable diseases still exacted as heavy a toll as thirty years previous. Two of the main offenders on this score were consumption, more often called tuberculosis after Koch's identification of the tuberole bacillus, and diphtheria. The latter even appeared to be growing in virulence, especially in the northern sections of the United States; in 1880 it accounted for 5,039 deaths for

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every 100,000 as compared to 422 in 1860. In New York City the death rate from diphtheria constantly increased between 1875 and 1890, reaching the alarming figure of 181.93 per 1,000 deaths at the latter date. By 1895 this disease was claiming yearly "hundreds of thousands" of child victims.

Diphtheria had been studied by sanitarians as early as 1863, when it caused 1,400 deaths in Vermont. In those days doctors considered diphtheria to be a "low vital dynamics" disease, brought on by the poisons of sewer gases and other environmental conditions that weakened the human constitution. It could best be eradicated by remedial sani-

20 Tenth Census of the United States, 1880, Mortality and Vital Statistics, XII, Part 2, p. xxxix. A partial explanation of this startling increase was the change in medical terminology between the two dates. What was formerly called croup was more often diphtheria in 1890. Ibid. The collection of vital statistics for the nation as a whole still remained unsatisfactory late into the twentieth century. Patriotism might well "wince" at the statement made by Uruguay soon after 1900, in which that nation regretted "its inability to draw satisfactory conclusions regarding the United States of America, because that nation has not yet attained to any scientific method of treating the subject." Samuel H. Adams, "Guardians of the Public Health," McClure's Magazine, XXXI, 1908, p. 244.

But diphtheria studies prosecuted by the National Board of Health in 1880-1881 emphasized the new germ theory and prepared American medicine for the new techniques of identification and inoculation being evolved in Europe.  

But America also was working out important original procedures in this fight against diphtheria. In 1892, to guard against cholera, New York City established a Division of Pathology, Bacteriology and Disinfection. It put Hermann M. Biggs in charge, who, on the threshold of his great career in public health work, immediately demonstrated the value of the new department. A bacteriology laboratory and disinfecting stations were set up at quarantine and not a case of cholera appearing in the harbor escaped the watchful eyes of Biggs and his men.

Once the cholera threat had ceased, Biggs asked for permission to use his bacteriological procedures in

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the diagnosis of diphtheria. He emphasized the economic gain that would result, for many pseudo-diphtheria cases were receiving unnecessary hospitalization. In May, 1893, Biggs employed Dr. William H. Park to take charge of the new diphtheria project, and the work began soon afterwards.

Not only was the culture test for diphtheria applied to all cases in the contagious hospitals, but also physicians in private practice were encouraged to submit cultures for diagnosis. To carry out this ambitious program, inspectors called on private practitioners reporting diphtheria cases and offered to have a bacteriological diagnosis made by the municipal laboratory. The great number of physicians who wished to avail themselves of this service made the system cumbersome, so the health department set up depots throughout the city where the physicians could conveniently pick up "culture outfits," together with directions for obtaining a specimen from the patient.24 After taking a culture of the patient's throat the doctor returned the outfit to the depot where the health department collected them every afternoon. By twelve noon of the next day a report of the diagnosis was mailed out to the

24 These outfits consisted of a long wooden box containing a culture tube, a swab for inoculating it, and a blank for recording data concerning the case. See Biggs, "Report to the New York City Health Department," loc. cit., 321-325.
physician, or he could get the information over the telephone. This service gradually became increasingly popular with doctors, for it quickly separated the real diphtheria cases from those less harmful. During the first year more than 2,623 cultures were examined, of which approximately 613 proved to be pseudo-diphtheria.25

By taking periodical cultures of convalescent patients, Biggs soon discovered that the virulent diphtheria germ frequently lingered long after the disease had departed. This discovery turned out to be extremely important, for the further spread of the disease could be prevented by lengthening the period of isolation until the patient developed a negative culture.26 It also led to another disclosure even more important to preventive medicine. Park found that many well persons who had been exposed to diphtheria carried the germ with them in a virulent stage, although the person himself was not sick. This satisfactorily explained for the first time how disease could be transmitted without the victim of a communicable disease coming in contact with a person who was or had been sick. No longer need the sporadic case mystify the medical pro-


26 Biggs, "Report to the New York City Health Department," loc. cit., 322.
The conception of disease originating de novo was at last laid to rest.

The New York plan of bacteriological diagnosis was adopted "without modification" by the health agencies of many other American cities. By 1895 the health departments of Brooklyn, Boston, Washington, Philadelphia, St. Louis, New Orleans, Albany, Newark, Buffalo, Rochester, and Hartford had established diagnostic laboratories, and the Marine Hospital Service increased its activity in this field. Many local health boards in England, in addition to the Metropolitan Asylum Board of London, inaugurated systems modeled on that of New York.27

In the summer of 1894 Biggs sailed for Europe, where health authorities listened with keen interest to his description of the New York plan of diphtheria diagnosis. This pioneer work in public health met with unstinted praise. While these compliments proved pleasing to Biggs, he found in Europe new developments in the therapeutics of diphtheria which claimed his entire attention.

Diphtheria germs, it had soon been discovered, did not act directly on their victim; instead they generated a "toxin" which poisoned the patient. All the symptoms

27Ibid., 325; Winslow, Life of Biggs, 110, and pp. 101-130 for an excellent account of the diphtheria activities of Biggs and the New York Department of Health.
of diphtheria, even the disease itself, could be produced by inoculating a person with this toxin, even though the diphtheria germ was not present. In the fight to overcome the disease the body built up an antidotal substance in the blood, called "antitoxin." This substance, it was found, had the property of curing or alleviating the disease. Both Émile Roux in Paris and Emil von Behring in Germany had been working for years on isolating this antitoxin for therapeutic purposes, and Biggs reached Europe just in time to witness the successful culmination of their search. Both men had already secured impressive results from the new specific remedy.

Not waiting an instant, Biggs cabled Park in New York to prepare at once for the production of antitoxin serum. Doctors had long been groping in the dark as to the best method of treating diphtheria. Mostly they had tried local applications on the throat, or attempted to "weaken" the virulent germs by disinfectants and fumes.28 Mortality from diphtheria stood as high as 50 per cent in some years. If antitoxin could cure this dread disease there was no time to lose.

The manufacture of antitoxin was a lengthy proc-

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ess. To obtain the serum, animals of one kind or another (Behring used goats and Roux horses) were inoculated with doses of diphtheria toxin, at first with minute doses and later, as the animal built up the antitoxin content of its blood, with tremendous doses ordinarily many times the lethal amount. After a period ranging anywhere from three to five months a large quantity of blood was extracted from the animal and from this the antitoxin serum was obtained.29

When Biggs arrived home he found everything in readiness. An appropriation of $30,000 for the work would not be available until January, so Biggs, out of his own pocket, bought the necessary animals and the production of antitoxin serum began in October 1894. The first batch of serum was released for use on January 1, 1895.

Public interest in the new cure grew rapidly. In December 1894 the New York Herald sponsored a campaign to collect popular subscriptions in order to purchase antitoxin for the poor, and the New York Tribune, the day after Christmas, cheered its readers by reporting that the effec-

29William H. Park, "Diphtheria Anti-Toxine — Its Production," McClure's Magazine, IV, 1895, pp. 365-369. At first two goats, two sheep, three dogs, and a cow were used in addition to the horses, but when news reached New York of the remarkable results attained by Roux the other animals were discarded and more horses added. By December these numbered approximately fifty.
tiveness of antitoxin serum had not been exaggerated. Mean­
time, the project received the hearty endorsement of the
governor of New York, and other cities hastened to send
health officials to learn how to make the serum.  Biggs
took advantage of this popular curiosity to set forth in
Century Magazine and McClure's Magazine the great life-sav­
ing possibilities of the new cure. He particularly stress­
ed the point that besides having ability to prevent and to
cure, antitoxin was "under all conditions...absolutely
harmless."  

Opposition to this verdict soon developed. The
first serum of the New York laboratory was used on the pa­
tients in the Willard Parker Hospital. Throughout the year 1894
diphtheria patients admitted to this hospital received
the antitoxic treatment. Because of the limited quantity
of serum available at first, and because of the prohibitive
price of eight to twelve dollars a dose, the initial uses
of the antitoxin were confined to therapeutic rather than

30 New York Tribune, December 26, 1894, p. 6; Winslow, Life of Biggs, 113-115. The New York laboratory, as soon
as its production of the serum increased to the point where it could more than handle its own needs, sold its surplus
to other municipalities. Chicago alone bought more than three hundred dollars worth a week throughout 1896.

31 Hermann M. Biggs, "The New Treatment of Diphtheria," Century, XLIX, 1895, pp. 476-477, especially 477; also
preventive purposes.32 When the record at the Willard Parker Hospital was scanned after three months trial of the serum, the results turned out to be disappointing. Mortality had decreased by a few percentage points over the preceding year, but compared very unfavorably with the results attained in Europe. Biggs acknowledged that so far "nothing decisive" had been settled by the use of antitoxin in New York, but he also pointed out that inoculation of tenement house cases had met with more success. Nevertheless, anyone who had sat by the bed of a child and had seen the miraculous clearing-up of diphtheria after an inoculation could not for long deny the efficacy of the treatment.33

But such a doubter did exist. Dr. Joseph E. Winters, a prominent, positive-minded New York practitioner, objected strenuously to the use of the serum. Taking the Willard Parker Hospital cases as his text, he heatedly assailed the new technique as not only being useless but also very harmful, for this "horse serum" tended to produce


33"Some Experience in the Production and Use of Diphtheria Antitoxin," Medical Record, XLVII, 1895, p. 484.
a septicemia all its own. This criticism, from a man of Winters' standing, shook the faith of the public in antitoxin — a faith that until now had been undisturbed. Condemnations of antitoxin became vocal and were heard from all sides, and one doctor, a few years later, noticed that objections to antitoxin injections, even in physicians' families, coincided with the "waves" of opposition "in the medical or lay press."34

However, those who rejected antitoxin soon found themselves occupying an untenable position. During 1896 the New York diagnostic laboratory examined 25,049 diphtheria cultures, issued 16,796 vials of antitoxin, and immunized by serum 1,214 persons. The beneficial results of this program could not be denied. Diphtheria mortality fell from 29.7 in 1894 to 16.8 in 1896. From Berlin and Paris came even more startling reports.35 Notwithstanding, statistics alone could not bring complete victory to the defenders of antitoxin. It was vital to win the approval of the medical profession. Apart from a few doctors who backed Winters, most physicians reported that their own


personal experience with the serum had been very satisfactory — 600 out of 615 doctors pronounced themselves strongly in favor of the treatment. Only three of nearly six thousand cases handled by these physicians appeared to have been made worse by the antitoxin.36

Even in the face of such overwhelming evidence Winters stubbornly persisted in his opposition.37 By 1897 the results conclusively proved the value of antitoxin and Winters could be laughed out of court. Turning on him sharply, Biggs classed him with the anti-vaccinationists, who still existed in England, and accused his brand of "conservatism" as being a cloak for indolence.38 This stinging rebuke brought the controversy to an end.

Because of the effectiveness of the treatment, physicians administered the antitoxin with a shameful disregard of where and how the serum was made. Dosages varied as much as a thousandfold, an investigation disclosed, and this explained why results were so uneven in those early


37For the arguments of Winters see New York Medical Journal, LXIII, 1896, pp. 222-225; ibid., LXV, 1897, pp. 197-198; Medical Record, XLIX, 1896, pp. 877-893.

years. This situation was remedied in the next century when the United States Public Health Service standardized all biologic products.\textsuperscript{39} By that time serums and antitoxins for other diseases had been developed, and inoculation had grown to be an accepted and effective branch of therapeutic medicine.

While diphtheria antitoxin can be counted a great boon to public health, it was primarily curative. Used as a preventive measure, it gave immunity for only a month or two. The control of tuberculosis presented a different and much more difficult problem. This campaign, because of the type of disease and treatment, introduced new techniques and new factors into the public health movement.\textsuperscript{40}

Consumption had long stood at the head of the list of diseases responsible for the greatest mortality among men. Progress toward its prevention had to wait until the method of transmission was understood. At the time Henry I. Bowditch was making his studies on the character and origins of consumption,\textsuperscript{41} in the 1860's, medical opinion


\textsuperscript{40}Allen W. Freeman, "Preventive Medicine in Evolution," \textit{Bulletin of the Institute of the History of Medicine}, IV, 1936, p. 69.

\textsuperscript{41}Henry I. Bowditch, "Consumption in America," \textit{Atlantic Monthly}, XXIII, 1869, pp. 51-61, 177-187, 315-323, especially 55.
held that the disease was inherited. This accounted partially for the "indifference" displayed toward consumption. But there was yet another reason for such an attitude on the part of the general public. Tuberculosis, by its nature and the long period necessary for contagion to gain a foothold, gave each person "a feeling of individual security" that fostered apathy.\textsuperscript{42}

In the 1880's, after Koch's discovery of the tubercle bacillus, the question of the contagiousness of consumption became a disputed issue in the medical profession. The disclosure that more widows of men dying from consumption died of consumption than other widows tended to disprove transmission by inheritance and pointed to a long period of contagion.\textsuperscript{43} To many sanitarians the question was settled positively by 1890 — "the propagation of the disease germ depends upon the contamination of the well by the sick."\textsuperscript{44} Four years later the conviction that tuberculosis spread by direct infection had been accepted

\textsuperscript{42}Taking Care of the Health," \textit{Harper's Weekly}, X, 1866, p. 163.


officially by health authorities. 45

The announcement of the "tuberculin cure" by Koch had "aroused...greater interest, and produced greater excitement" among the public than any other medical discovery of the time. 46 When these hopes were dashed, however, other more tedious methods of treatment had to be evolved. Already the therapeutic properties of the Adirondack climate had been proven, and in 1884 Dr. E. L. Trudeau opened at Saranac Lake the first sanatorium for the poor. This proved to be an important landmark in the history of tuberculosis treatment. While several sanatoria were opened in the next sixteen years, including the first state sanatorium in Massachusetts in 1895, the first municipal sanatorium at Cincinnati in 1897, and the first Federal hospital for tuberculosis patients at Fort Bayard, New Mexico, in 1899, it was not until after the turn of the century that the establishment of sanatoria for the poor became an integral part of public health work. 47 This development in state medicine was to have a profound influence on the "new pub-


Those enlightened individuals who urged that preventive measures be taken against tuberculosis worked under a double handicap — the intense, sometimes bitter opposition of the medical profession and the imperceptible results obtained. The difficulties encountered in New York can well serve as an illustration. Under Biggs' leadership the health department in 1889 declared tuberculosis to be a communicable disease and issued a leaflet giving the essential facts on the causation and prevention of the disease. Five years later all public institutions were required to notify the health authorities of every case of tuberculosis received by them, and the bacteriological laboratory extended free diagnosis of sputum to the physicians of the city. It was in 1897, however, that real opposition to these policies of the health department crystallized. In that year an ordinance was passed establishing compulsory notification of tuberculosis by private practitioners. Immediately the medical societies of New York and Kings counties objected on the grounds that the health department was invading the domain of the private physician. These societies attempted to have the state legislature revoke the charter under which the health department operated. Biggs resisted tooth and nail and finally won the battle. In
1907 the state legislature legally reinforced his stand by declaring tuberculosis a communicable disease and subject to compulsory notification.48

Yet, important as that struggle was, from the viewpoint of the future health program the most significant development took place in Philadelphia, where Dr. Lawrence F. Flick49 was leading the fight against tuberculosis. In 1892 he organized the Pennsylvania Society for the Prevention of Tuberculosis, the forerunner of other state tuberculosis societies and of the National Tuberculosis Association, the latter founded in 1904. This successful attempt to enlist the voluntary aid of the general public in the tuberculosis campaign introduced a form of activity soon to spread to other fields and scarcely to be overestimated as an important factor in the control of disease.

The germ theory led to the use of serums and antitoxins in curative medicine. In preventive work it meant sureness of diagnosis, immunization, and effective means of checking the spread of communicable diseases. Already by 1900 diphtheria, rabies, typhoid, tuberculosis and other diseases were giving ground before man's increasing knowl-

48Ibid., 6-9; Winslow, Life of Biggs, 131-152.

49For a biographical sketch and a portrait of Flick see Knopf, History of National Tuberculosis Association, 421-427.
edge. But the war against disease was still in the 1890's "a business for the professional." After 1900, thanks to "the mobilization of the lay forces of the community," warfare against disease was waged by the people as a whole. 50

The ideal of every sanitarian of the preceding fifty years — an aroused public opinion — seemed near realization.

50 Winslow, Life of Biggs, 200.
Chapter X

THE NEW PUBLIC HEALTH

The public health movement came of age in 1900. From then forward progress in preventive medicine was "to be sought, not in sanitary science, but in social theories...."¹ To be sure, only half the road had been travelled, but in sight were heartening prospects. With certain limitations, asserted Biggs, American communities could now "determine what degree of healthfulness their city shall have." This statement, shortened into the pithy phrase that PUBLIC HEALTH IS PURCHASABLE, became the motto of the health administration of New York.² For fulfillment it needed more than ever before the sympathetic support of the general public.

The task ahead presented real difficulties. Control of most infectious diseases now depended upon the control of man himself, which was a much harder job than checking diseases transmitted by animals or by the environment.³


²C.-E. A. Winslow, Life of Hermann M. Biggs, 120.

Necessarily, the first requisite of the new public health program was to obtain the consent of the governed.

A democracy, unless of the enlightened variety, appeared to most sanitarians to be the least favorable form of government for sanitary reform. The cry of economy had a far greater appeal than the cry for reform. Sanitary authorities in those cities where the "workingman owns his own home" experienced greater difficulties than health officers of other communities "in meeting health needs, in securing adequate appropriations, in enforcing higher standards."5

Yet in this very weakness was hidden a great source of strength. The key rested with the willingness of the public to accept the autocratic rulings and paternalistic functions of health agencies. If the population could be educated to demand hygiene, it would become "possible to adopt measures more arbitrary in many respects than could be adopted in most other countries," simply be-


cause the government was democratic.6

Before this ideal situation could be attained, certain social ills had to be corrected, principally the wretched housing in congested districts and the harsh economic and industrial conditions.7 These evils had their supporters, whose very ruthlessness, however, tended to strengthen the forces for change arrayed against them. The acquisitive instinct had reigned practically without opposition since the Civil War, while the moral force of the nation had been exhausted over the slavery controversy. The latter now showed signs of reviving; the nation began to develop a "social" conscience. In the 1890's, for instance, municipal reform became a vital issue to public-spirited citizens, and already by the turn of the century this crusade had a number of victories to its credit. An era of reform was at hand. Many of the clashes between progressives and conservatives occurred outside the field of activity assigned to preventive medicine, but each reform in municipal affairs or industry helped to reenforce the public health movement. But within the borders of the movement itself there existed certain elements that either had to be won over or conquered.

6Winslow, Life of Biggs, 158.
7Ibid., 230.
Business interests were still rebelling against the dictates of health boards. In 1900, when bubonic plague gained an entrance to San Francisco, businessmen — and even the governor of the state! — brought pressure to bear on the local health authorities to conceal the fact. When Dr. J. J. Einyoun of the Marine Hospital Service could not be silenced concerning the health danger, they went so far as to try to have him removed.8 A similar situation arose in Niagara Falls, New York, in 1914 regarding a smallpox epidemic, but drastic measures and "pitiless publicity" by the state health department quelled the defiance of the city's business interests.9 Opposition of this type became less and less frequent. It was not to be long, in fact, before business extended to public health its closest cooperation, especially in the field of industrial hygiene.10


9 See Winslow, Life of Biggs, 264-266.

10 Although the first factory legislation by the states was passed in Massachusetts in 1852, little real progress resulted until after 1900. The Federal government, of course, restricted its legislation to its own employees. The subject of industrial hygiene did not begin to receive serious attention until about 1906. See George M. Kober, "History of Industrial Hygiene and Its Effect on Public Health," in Mazyk P. Ravenel, ed., Half Century of Public Health, pp. 361-411, especially 372, 405.
feller Foundation, the Carnegie Institution of Washington, and the John McCormick Institute for Infectious Diseases, business officially adopted public health as one of its pet charities. American fortunes not only financed medical research but took practical measures to eliminate disease. The hookworm campaign in the South, which was supported by Rockefeller funds, raised the health standards of that section, especially the rural areas, to within reach of those prevailing elsewhere. But the efforts of American wealth did not stop short at the nation's boundaries. In the years before World War I, American doctors, under the sponsorship of health foundations, sought the four corners of the world to track down and eradicate disease.

Another source of opposition to the new public health program originated within the medical profession. This antagonism undoubtedly sprang from the same motives that moved businessmen to protest. Many of these doctors "resented and opposed" any proposal to enlarge the field of preventive medicine, insisting instead that its operation be confined within "the traditional narrow lines."

The increase in the number of doctors by 1900\(^\text{12}\) probably accounted in great part for this fear that the sanitary authorities were encroaching upon the territory of the private practitioner. The resentment of the medical profession in general can be roughly measured by the greeting extended to the American Public Health Association by the local profession when it met in Minneapolis in October 1899. The welcomed far outnumbered the welcomers, and more doctors from Mexico attended the regular sessions than did Minneapolis physicians.\(^\text{13}\)

Not all doctors subscribed to this narrow view, best characterized by the words of a South Carolina doctor-politician: "What do you [physicians] want of laws to prevent folks being sick? Ain't that the way you make your livin'?"\(^\text{14}\) Fortunately, many of them did care. In the vanguard of the public health movement marched a large group of unselfish, farseeing medical men. They, as much

\(^{12}\)There was about one doctor to every 642 inhabitants by 1900. Samuel W. Abbott, Past and Present Condition of Public Hygiene and Medicine in the United States, 80.

\(^{13}\)So sparse was the attendance of local medical men that one delegate inquired sarcastically: "Are there no doctors in Minneapolis?" William H. Allen, in "Sociological Notes," Annals of the American Academy of Political and Social Science, XV, 1900, p. 131.

as any other group, welcomed the increasing authority of health officials.

Health legislation after 1900 steadily if sometimes slowly forged ahead. The health department of New York City grew rapidly both in authority and function, and proved an inspiration and example to other communities. Perhaps the greatest advances took place in the realm of state control. The Massachusetts health board had over the years built up its prestige to such a point that "its letters of advice" possessed "the force of law." Small wonder that this should be so. The names of those who served in the Massachusetts health department — Dr. Samuel W. Abbott, Hiram F. Mills, William T. Sedgwick, George C. Whipple, Dr. Theobald Smith — cannot be matched in ability or public spirit by any other state. In 1913 New York passed a new state health law which provided for the direct supervision of local health boards, a precedent whose importance can scarcely be overestimated. New governmental agencies also made an appearance. In 1908 the first county health board was founded, and three years later Yakima County, Washington, inaugurated the first whole-time county health service in the nation. At last a field long-neg-

15George C. Whipple, State Sanitation, I, 130.

lected, the rural community, began to receive the attention it deserved. Meantime, the Marine Hospital Service passed through a reorganization in 1902 and emerged as the United States Public Health Service. As such, it expanded its activities and its research into new areas, while at the same its control over quarantine increased with each passing year. Finally, by 1921 every state and city in the nation had delegated its quarantine duties to this Federal bureau.

When the public health program shifted its emphasis from man's environment to the control of specific communicable diseases in the 1890's, it necessarily restricted its activities. By the middle of the first decade of the twentieth century sanitarians saw the need of once again broadening the scope of their operations. There was no return, however, toward environmental sanitation in the old sense. Many municipal matters that had concerned earlier sanitarians, such as street cleaning, had gravitated into other hands, where they really belonged. The new public health program, rather, embraced the control of all "infectious diseases...to greater or less extent preventable," and to "all other forms of disease which are the result of insanitary living, occupations, habitations, or surroundings," including industrial diseases, and also "the surveillance of the water and food supplies and the sewage
disposal.\textsuperscript{17}

The story of how this new program was carried out cannot be reviewed here. Its keynote was prevention. Science contributed surer and finer and better instruments for fighting disease. Just as important were the new social instruments evolved — to name two, the public health nurse and the free clinic. Health education played an important role, reaching out to the individual in his home, his shop, or his children's school, to teach hygiene and health precautions. The effectiveness of this campaign was soon demonstrated, especially in the field of child welfare, for communicable diseases claimed fewer and fewer lives as the years passed. This improvement was not confined to any one district or state, but was nation-wide. It was not long before it could be said of America that there existed "few places in the world where the traveller on train or boat, and in hotels and restaurants can eat and drink with as much safety against enteric and other diseases...."\textsuperscript{18}

But was this enough? Although the "new public

\textsuperscript{17}Biggs, "Preventive Medicine; Its Achievements, Scope and Possibilities," \textit{loc. cit.}, 956.

health, "with eyes fixed "not upon man's environment but upon man himself," had accomplished great things, yet the physical condition of the people had not shown as much improvement as the falling death rate seemed to imply. Perhaps, after all, the early sanitarian, with his emphasis on environment, had much to be said in his favor. He not only tried to save human life but to promote human vitality.\textsuperscript{19}

To a certain extent he succeeded in both. When the public health movement began about 1850 the death rate stood well above 30 per thousand in most American cities; when the century closed it had fallen to below 20.\textsuperscript{20} Measured in terms of one life a man could now look forward to forty-two years of life instead of the mere twenty-five he could reasonably expect in 1866. In a city as large as New York this amounted to an annual savings of 28,000 lives a year.\textsuperscript{21} This impressive gain cannot be credited to the

\textsuperscript{19}Whipple, \textit{State Sanitation}, I, 234-236. For a good exposition of the difference between the old and the new practices, see Hibbert W. Hill, \textit{The New Public Health} (New York, 1916), 63-78, and for the broader aims of the modern program, Michael M. Davis, \textit{America Organizes Medicine} (New York, 1941).


public health movement alone. Diet, improved living facilities, a thousand and one factors entered into this change. But to the sanitarian, looking back over the years, a considerable percentage of the gain rightfully belonged to his efforts.

But the American sanitarian was not given to looking back. Public health in his nation had got a later start than in most European countries, especially England, and by 1900 this gap had not been completely closed. In America the road had been rougher, with more obstacles to overcome. But once the way had been cleared, America soon equalled and then surpassed Europe in public health work. Recognition of this fact came in 1908, when Koch, on a visit to New York, said that while Germany had contributed most of the bacteriological discoveries, "we in Germany are years and years behind you in their practical application."23

The pioneer sanitarians of America had a great


23Winslow, Life of Biggs, 217.
many achievements of which to feel proud. When they came upon the scene the American city resembled a shambles; fifty years later orderliness had replaced chaos. All those civic improvements that make life more pleasant and comfortable came within their ken. The health movement they sponsored began as a protest against degrading living conditions. In addition to matters that touched directly on health they displayed an interest in working conditions, in wages, in intemperance, in illiteracy, in child labor, and in crime prevention. These men were as much humanitarians as sanitarians. They had, above all, "a broad humanist understanding of the forces that affect health."  

Most important of all, they did not labor in vain. What they accomplished between 1850-1900 laid a firm foundation upon which the public health program of today, with its bright hopes of a safe new world, rests.

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