

“C.-E.A. Winslow and the Early Years of Public Health at Yale, 1915-1925”

ARTHUR J. VISELTEAR, Ph.D., M.P.H.

*Associate Professor of the History of Medicine and Public Health,
Yale University School of Medicine, New Haven, Connecticut*

Received April 20, 1982

C.-E.A. Winslow was the first chairman of the Department of Public Health at the Yale University School of Medicine. This paper considers the development and changing agenda of his department, the structure of Yale University, and the maturation of public health as a discipline. Winslow's successes and failures are discussed as they relate to Yale and external societal influences.

In 1925, C.-E.A. Winslow, Anna M.R. Lauder Professor of Public Health at Yale, published an article in *Science* describing the design and philosophy of the department he had chaired for ten years. He contrasted the public health programs at Harvard and Johns Hopkins, both of which had developed as independent schools of public health, cognate with schools of medicine and law, with Yale's program which had been developed "in more intimate correlation" with its medical and graduate schools. He believed there was no single proper place for public health in a university as each was dependent upon a host of historical facts, philosophies, and traditions. Yale's place, likewise, was distinct and unique, and Winslow outlined the advantages which had become manifest in the first decade of public health at Yale [1].

Winslow's philosophy of public health was derived from his two mentors, William T. Sedgwick and Hermann M. Biggs, but the development of public health at Yale was dependent upon not only Winslow's own training and experiences, but upon the emergence of public health as a distinct discipline and profession, changing social and economic conditions, and the structure of Yale University. This paper will consider Winslow's nascent department and the sounding of the ideas, attitudes, and agendas which served as the basis for later public health developments at Yale and other institutions.

I

Public health training programs in teaching institutions date from the early 1900s. Although Sedgwick had begun to instruct men in biology and engineering at the Massachusetts Institute of Technology in the 1880s, many of whom, including Winslow, found their way into municipal and state health departments, the first comprehensive course work leading to an advanced degree in public health was not offered until 1906 [2]. Training programs were established at Pennsylvania, Colum-

bia, Toronto, and McGill, but, as late as 1907, some ten years after the establishment by the American Public Health Association of a committee to review the granting of public health degrees, Edward T. Devine, an eminent social commentator, offered the opinion that no truly comprehensive program in preventive medicine, administration, and sanitary science was visible in the major universities [3]. Wickliffe Rose, director of the Rockefeller Sanitary Commission, and others expressed similar sentiments and recommended the establishment of special schools of public health or preventive medicine to train future health officers in methods of administering their positions properly [4].

At precisely this time, Irving Fisher, professor of political economy at Yale, emphasized the need for a new profession of public health officers trained in the medical and graduate schools of American universities. Fisher had survived a severe case of tuberculosis and, as a result of this experience, became deeply involved with health affairs. He established with Harold Ley the Life Extension Institute, a society which sought to promote "sane living and periodic physical examinations," helped organize the Committee of One Hundred on National Needs, studied the economic impact of disease on society, and served on an American Medical Association committee appointed to study and improve medical school education [5].

In 1907, Fisher drafted a proposal which he sent to his colleague George Blumer, the professor of medicine at Yale. With a minor reorganization of courses already being offered, in the Sheffield Scientific School and the graduate and medical schools, Fisher believed that an outstanding public health program could be developed. The medical school, he wrote, already offered courses in hygiene and bacteriology, in the economics department could be found several faculty members "particularly interested in the sociologic applications of preventive medicine," and the Scientific School had "already made a reputation for itself in sanitary engineering and dietetics" [6].

Blumer, a Hopkins-trained physician, agreed to meet with Fisher and a third colleague, the physiological chemist, Lafayette Mendel. From their deliberations came the outline for a new department which they believed could be called either "Public Health and Public Service" or "Hygiene and Philanthropy." Students admitted to the new department would have to meet the strict prerequisites of the graduate school and be expected to take a total of forty-one courses including anthropology, bacteriology, law, natural and physical science, "public hygiene" (which comprised vital statistics, sanitary administration, quarantine, and occupational health), tropical medicine, and "economics and labor history," "poverty and crime," and "practical philanthropy." The graduates of the program would receive a diploma and enter any number of public health and welfare positions in charity and voluntary associations or settlement houses, or become public health officers or public health nurses [7].

The proposal went through numerous drafts and, once agreed upon by the three principals, was circulated through university channels. Various comments were received, and Yandell Henderson of the medical school was typical of the unfavorable reactors. The program, wrote Henderson, was unsuitable because the scientific and clinical components were unfocused. Moreover, students entering such a program were bound to enter with different backgrounds and seek different goals. The forty-one courses, he wrote, more properly could be consolidated into three or four discrete programs that Henderson believed would render inoperable the concept of a "unified" department. His own recommendation was to delete the graduate and Scientific School focus, and redesign the plan for medical students

only, who would take, concurrent to their medical courses, an additional comprehensive course in "sanitary science." At the completion of their course of studies, the student would receive both the M.D. degree and a second degree, the Diploma in Public Health [8].

With confusion the major theme expressed by the many commentators, Yale's Committee on Graduate Education in 1908 ruled the plan "inoperable" and withheld approval. Whereas public health programs were being established at Harvard and Pennsylvania and, in Cambridge, MIT and Harvard in 1913 had combined their resources to establish a School for Health Officers under the tutelage of Sedgwick, George C. Whipple, and Milton J. Rosenau, Yale demurred and remained oblivious to both its own resources and the opportunities in this new discipline until 1914 when, as a result of an intense fund-raising effort planned to coincide with the Centennial Anniversary of the School of Medicine, the university received a substantial endowment of \$500,000 from the family of Anna M.R. Lauder for the specific purpose of establishing a chair in public health named after the benefactress. Blumer, who in 1910 had been elected dean of the medical school, agreed to establish a Department of Public Health on a scale and model to be determined by the man selected as Lauder Professor.

The terms of the bequest, however, established certain ground rules. The professorship, for example, was to be held by a physician who was widely experienced in public health and sanitary affairs. He was also to be capable of dealing effectively with the public and be astute in politics, especially as a stated objective was that the department lead the drive to revise existing public health laws and redesign the administrative public health machinery of the state.

Suggestions as to who might fill the chair were requested from many public health and medical leaders, including Biggs (New York), Rosenau (Harvard), Sedgwick (MIT), Jordan (Chicago), Pease (Lederle Laboratories), Park (New York City), and Westbrook (Columbia). The list contained a number of well-known Public Health Service professionals (Joseph Goldberger, Wade Hampton Frost, John F. Anderson, and George C. McCoy) and others representing the fields of sanitary engineering and bacteriology [9]. The choice, however, fell to a non-physician, Charles-Edward Amory Winslow, who in 1915 held coterminous positions as director of publicity in the New York State Department of Health and as curator of public health at the American Museum of Natural History.

II

Winslow's highest degree at the time of his appointment was a master of science degree from MIT [10]. He nevertheless was an ideal choice. He had been born in Boston, the son of Erving Winslow, a merchant and publicist, and Catherine Mary Reingolds, an English actress who played Shakespearean heroines and popularized Ibsen's plays in America. Following graduation from the English High School in 1884, he entered MIT as a student in Sedgwick's Department of Biology [11].

Sedgwick was the preeminent public health figure of his day. He began his career intending to become a physician and enrolled in the Sheffield Scientific School at Yale. Influenced by Russell Chittenden, professor of physiological chemistry, he studied medicine for two years at Yale (at the same time teaching chemistry at the Scientific School) and decided to pursue science and research in general biology and experimental physiology, abandoning Yale for Hopkins and studies with H. Newell Martin and W.K. Brooks.

Sedgwick received his Ph.D. and was called in 1883 to MIT as professor and

chairman of their Department of Biology. He devoted his considerable energies to applied biology in the cause of public health, working on the poisonous effects of coal and gas, the control of communicable diseases, and water safety. As consulting biologist to the Massachusetts State Board of Health he supervised the work at the Lawrence Experiment Station. Sedgwick's writings on sanitary science, his investigations of the typhoid epidemics at Lowell and Lawrence, and his pioneer investigations of the problems of water and sewage purification brought him into national prominence and raised MIT to the top of the list of institutions then offering instruction in the field of public health science.

Winslow entered MIT when public health was emerging as a distinct discipline. Before Sedgwick's time public health had been based only upon environmental control. With development of the germ theory of disease, vaccine prophylaxis, and serum therapy, both environmental sanitation and bacteriological control of the acute contact-borne infections had begun to bear fruit. As Hibbert Hill described it, the public health of the 1880s sought the sources of infectious diseases in the surroundings of man; the public health of the 1890s found them in man himself [13]. Sedgwick and his students examined both man and the environment in courses such as industrial microscopy, general bacteriology, industrial biology, bacteriology of water and sewage, principles of sanitary science and the public health, municipal sanitation, personal hygiene, physiology, theoretical biology, mathematics, analytic chemistry, heating and ventilation, geology, and sanitary engineering, all of which were offered in Sedgwick's department of biology or other departments at MIT [14].

Trained and inspired by Sedgwick to enter a career of service, Winslow, as had his mentor, abandoned his original goal of medicine for public health science. After receiving his B.S. degree in 1898, he began graduate studies at MIT, making a notable investigation of the action of freezing on the typhoid bacillus and analyzing the role of ice as a vehicle of disease. This work served as the basis for his M.S. essay (1899), published in 1902 in the *Memoirs of the American Academy of Arts and Sciences* [15].

Winslow served as an assistant and then instructor in sanitary bacteriology in Sedgwick's department. In 1904, he co-authored with Prescott *The Elements of Water Bacteriology* [16] and, a year later, published *Elements of Applied Microscopy* [17], the same year he was promoted to assistant professor, a position he held concurrent to biologist-in-charge of sanitary research. He was also appointed head of MIT's sewage experiment station, preparing a number of scientific studies, including an investigation of the purification of Boston's sewage. His most important publication was an extensive study of the *Coccaceae* in which he also considered principles of bacterial classification, a subject which absorbed his interest until the early 1920s [18].

In 1909, E.O. Jordan, Professor of Bacteriology at the University of Chicago, who had studied with Sedgwick and knew Winslow both well and favorably, planned a sabbatical leave and invited Winslow to fill in during the winter term [19]. Winslow agreed and, appointed assistant professor in Jordan's department with a salary of \$1,000, left Cambridge for Chicago, detaching himself from MIT with Sedgwick's blessing. "Sedgwick's men," as they were called, were in important posts all over the nation and throughout the world. It was now Winslow's turn, after sixteen years, to find his own niche.

Winslow's responsibilities at Chicago were to deliver eleven lectures on the general topic, "Industrial Hygiene and Municipal Sanitation," and also to present a series of

public lectures that proved to be very popular with those who attended, many of whom, according to a news story in the *Chicago Tribune*, were "delighted" to learn that "not all bacteria were bad." The public course consisted of lectures on bacteriology and parasitology, sources of infection, sewage and sewage disposal, water supply, "milk and its dangers," insect carriers, immunology, and "tuberculosis and vital resistance." The course for the students consisted of lectures and laboratories and addressed the effects of accidents, poisons, and bad ventilation on the life and health of factory workers, and general methods of public health administration with special reference to the disposal of sewage and garbage [20].

A popular, indeed eloquent, speaker, Winslow was an immediate success and much in demand; M.P. Ravenal, chairman of the Department of Bacteriology and Hygiene at the University of Wisconsin, for example, invited Winslow to Madison to speak on the topic, "The Organization of the Campaign for Public Health" [21]. At the Chicago Academy of Sciences Winslow delivered an address on "Insect Carriers of Disease" [22]; before the Biological Club of the university he spoke on "The Relation of Air to the Causation of Disease" [23]; at the bi-monthly meeting of the Western Society of Engineers he described and analyzed the legal ramifications of "The Jersey City Water Supply Case" [24]; and before the Chicago Medical Society, following a paper on the prognosis of angina pectoris, Winslow discussed "The Future of the Campaign for Public Health" [25].

It was in this 1910 address to the medical society that Winslow began to develop themes which he would return to often in subsequent papers and speeches. The public health campaign, he said, had passed through three phases: intuitive, experimental, and economic. No longer were public health professionals as concerned as they once were with "dubious, minor dangers," such as decaying organic matter or sewer gas. Now they were concerned with "newer" problems such as the prevention and control of tuberculosis and the reduction of infant mortality. The two professions responsible for the control of disease and the promotion of health, he continued, were the engineer who deals with the environment and the physician who cares for the individual. The engineer was a trained specialist, but the majority of the physicians who became health officers accepted their posts without prior training in any aspect of the sanitary sciences or public health. In addition, the individual physician increasingly was being asked to serve as a sanitary and hygienic adviser to his patients at a time when no one was receiving training in this area in medical school [26].

III

Following his visiting professorship at Chicago, Winslow was able to secure a post at the College of the City of New York, as associate professor of biology in the Department of Natural History. The department Winslow entered was a modest (some said "rather dead" [27]) one, offering relatively few electives in comparison to the departments of chemistry and physics. Winslow determined, by reviewing the curricula of other universities, that "natural history" was an anachronism as a departmental unit; other programs had divided into separate and independent cognate departments of zoology, botany, geology, mineralogy, and anthropology. At CCNY, the natural history courses were not grouped at all and instead appeared as a series of electives. Conspicuously absent from the curriculum were courses in botany, heredity and evolution, and even bacteriology [28]. Winslow, hired to develop a program in "public health bacteriology" (which would consider

“laboratory methods of biology as applied in the work of state and municipal boards of health,” the biological methods to diagnose diphtheria, tuberculosis, malaria, and typhoid fever, and the sanitary examination of water and milk supplies [29]), was able to convince the chairman to add an additional “advanced” course that would serve as a senior seminar for students engaged in independent research projects. Never abandoning his bipartite approach to education, whose goal was the production of able public health personnel who would serve in public capacities as well as those who would advance science in their academic laboratories, Winslow succeeded in developing a productive program which brought credit to CCNY and himself.

Publishing over fifty scientific papers while at CCNY, Winslow also found time to serve as curator of public health in the American Museum of Natural History, preparing numerous exhibits including one depicting the role of insects, and especially the housefly, in the dissemination of disease [30]. It was this promotional side of his public health career that brought him to the attention of Biggs, then newly appointed commissioner of the New York State Health Department, who asked Winslow to serve as his director of publicity, with special responsibility for public health education and health promotion.

Biggs was an administrative genius who perhaps more than any other public health officer “modernized public health administration in conformity with the new knowledge of the origin, nature, and transmission of infectious diseases” [31]. He earlier had served as director of the Division of Pathology, Bacteriology, and Disinfection in the New York City Health Department, where he established in 1893 the first municipal diagnostic and research public health laboratory [32]. He helped plan the immunological control programs for diphtheria, established programs for the administrative control of tuberculosis, and, as commissioner of the State Health Department, overcame political turmoil, dissension, and cronyism to emerge as the most successful and respected health officer of his day. According to William Henry Welch, Biggs was “deliberate and wise in judgment, steadfast in purpose, tenacious of principles in which he believed” and, additionally, fortunate in the selection of assistants, whose loyalty he effortlessly secured. Biggs’ lasting fame now rests on his contribution to the control and prevention of disease, but he also profoundly influenced the “entire domain” of public health [33], a goal which Winslow subsequently chose as his own in the years ahead [34].

Biggs, as had Sedgwick, aroused in Winslow a fierce loyalty and dedication. The two became close friends and allies and Winslow was given increased responsibility to develop strategies, prepare innovative health exhibits and demonstrations, and edit the department’s *Health Hints* and newsletter, *Health News*.

IV

The Lauder endowment in hand at Yale, the recommendations for chairman reviewed and rereviewed, Blumer in 1915 decided that Winslow was the exact man they needed as professor and chairman. Why Winslow was ultimately selected is lost in conjecture, as no document exists which precisely answers this question. There are, however, a number of explanations. The first is that Winslow was strongly recommended by two of the foremost public health leaders of the time: Sedgwick and Biggs. A second explanation is that the other candidates, including McCoy, Anderson, Frost, and Goldberger [35], were primarily scientists and field epidemiologists. Trained as physicians, they wrote many scientific papers in the fields of infectious diseases and preventive medicine. Each would have been an

outstanding choice if Yale were not restricted by the terms of the Lauder gift stipulating that the new chairman be not only capable of advancing science, but be ready to sally forth in the political arena on the public's behalf, prepare health surveys, and revise the state's archaic public health statutes.

Sedgwick had indoctrinated Winslow in the sciences basic to public health and Biggs had tutored Winslow to appreciate and reckon with those external forces of sloth, ennui, and greed which retard, severely limit, and occasionally engulf public health goals. Reviewing Winslow's recommendations and publications, Blumer doubtless felt comfortable that Winslow, as scientist, administrator, and budding statesman, was best suited to set the agenda for the new department.

There is another explanation which should also be set forth. Winslow understood the administrative structure of Yale University and his objectives for the department were compatible with the programs of the university's three major scientific components, the Scientific School, the Graduate School, and the School of Medicine. When Blumer and Winslow met to negotiate the position, for example, Winslow expressed the opinion that public health at Yale should not duplicate educational programs already in place elsewhere. Instead, Winslow decided to focus his attention on "the education of undergraduate medical students along the lines of preventive medicine" [36]. As Henderson had earlier recommended, the Yale program would be devoted to the training of medical practitioners whom Winslow would infuse with the "spirit of prevention." Winslow also requested and was granted permission to establish a one-year Certificate of Public Health program, which became even more important than the programs established for the medical students.

Winslow's department was one of eight medical school departments (the others being anatomy, physiology and physiological chemistry, bacteriology and pathology, pharmacology, medicine, surgery, obstetrics and gynecology) and Winslow, by rank, became one of the eight members of the medical school's governing body, the Board of Permanent Officers. From this position, and with Blumer's support and the support and encouragement of Yale's president, Arthur T. Hadley, Winslow sought to build bridges to other parts of the university. He sent letters to Russell Chittenden, director of the Scientific School, requesting that his courses be cross-listed in their bulletin [37]. To the chief administrative officer of the Graduate School he similarly wrote, requesting that his courses be made available to any student interested in pursuing elective work in public health [38]. And supporting Winternitz and Blumer, he was able to establish a united "Department of Bacteriology, Pathology, and Public Health" as one of the twenty-seven departments of the graduate school [39].

If Winslow had decided upon another route, to develop, for example, a school of public health, he would, very likely, not have been hired, as Yale's finances for graduate education were limited and the academic resources already in place were jealously guarded by the other organizational units of the university [40]. The modest, compatible program Winslow envisioned for his department was exactly right for the university.

Winslow's departmental budget was \$8,000 a year. From this sum came his own salary and that of an instructor, janitor, and secretary. Almost as soon as he took up residence his first goal was to increase his budget and hire more staff. As he privately sought additional funds, publicly he looked to existing departments for faculty whose courses would supplement his own courses in public health principles, public health administration, and vital statistics [41]. And he was not unsuccessful, finding

Winternitz in pathology, Rettger in sanitary bacteriology, Smith in immunology, Mendel in physiological chemistry, Harrison in zoology, Suttie in sanitary engineering, and, later, Blake in medicine and Park in pediatrics. When Gesell joined the medical school, Winslow sought him as well, inviting him to prepare a public health elective in mental deficiency [42]. A separate school of public health would have had to develop its own independent departments; at Yale he had only to reach out across the hall for assistance. The "real advantage" of the Yale program, he wrote, was that the various sciences ancillary to public health were taught by men who were interested in them "primarily as fundamental disciplines rather than in their application to the administrative health field" [43].

Seeking alliances in the Scientific School and the Graduate School, Winslow developed a comprehensive non-medical program leading to the Certificate in Public Health (C.P.H.), the Doctor of Public Health (Dr.P.H.) and the Ph.D. By 1925, Winslow had supervised eighteen students for the C.P.H., ten for the Ph.D., and four for the Dr.P.H. [44].

The C.P.H. degree was equivalent to a master's degree and was established as a one-year course for college graduates or for students who had completed two years of medical school [45]. The courses leading to the certificate included principles of public health, public health administration, public health bacteriology, immunology, elements of sanitary engineering, and vital statistics. Elective courses were recommended and a thesis required. Winslow's students specialized in bacteriology, statistics, or administration. They enrolled in courses in collateral departments and met with those Winslow invited as guest lecturers to his afternoon seminars which were held, as Sedgwick had held his, in his own home [46].

The students who completed the C.P.H. filled the need for men and women who combined training in public health with training in other subjects, such as economics and sociology, to serve as directors of anti-tuberculosis societies and other voluntary societies where the medical degree was unnecessary. Those C.P.H. students who graduated with specialization in bacteriology found their way into state and city laboratories and university research departments, whereas the Ph.D. students who specialized in bacteriology or statistics were prepared for positions as directors or chairmen of those laboratories or university programs. Students seeking the Dr.P.H. degree, the highest degree in public health, were required to hold either a bachelor's degree in a basic science or a medical degree. The Dr.P.H. was attainable in six years for non-M.D.s and eight years for those with the M.D. Yale, unlike other universities, only admitted M.D.s to its Dr.P.H. program [47].

In all that Winslow wrote it is obvious that his main wish was to reach the medical students. They were the ones needed to fill the major administrative positions in public health. As he wrote in 1910, and again in 1920 and 1923, the public health profession was becoming less concerned with the control of the environment and communicable diseases and more concerned with the application of medical knowledge to the early detection and preventive treatment of disease. Physicians were needed to direct infant welfare stations, school health programs, and tuberculosis clinics, to lead venereal disease campaigns, and to control "degenerative diseases." Medical students, however, were oblivious and even contemptuous of the opportunities in this branch of public service, and Winslow found a subtle but real prejudice against public health even at Yale [48].

When, for example, Winslow requested that Louis Dublin, the eminent statistician of the Metropolitan Life Insurance Company, be promoted from part-time in-

structor to assistant professor the request was denied [49]. Edgar Sydenstricker, the leading health statistician and epidemiologist in the United States, was likewise denied a post because Yale's president, James Angell, refused to consider using for this purpose funds from the Sterling endowment [50]. Winslow's proposal to establish a Sanitary Research Laboratory in the graduate school was received politely, but quietly tabled [51]. And his own salary was disputed for two years, the university wishing to continue, as it had for the clinical faculty of the medical school, the practice of recommending that professors supplement their salaries with outside income, in Winslow's case the \$1,000 he earned (and continued to earn until 1922) as curator at the American Museum of Natural History [52].

The biggest shock of all came in 1919 when the curriculum committee of the medical school, in an endeavor to reduce the overall number of hours devoted to lectures, thereby freeing time for "independent thinking," reduced the number of hours allotted to public health from 150 to 105 hours. Protesting bitterly to Blumer, Winslow expressed astonishment that this decision had been made without any opportunity for him to consider or criticize the plan.

It is clear as day to those who are in touch with general tendencies in medicine that the public health aspects of medicine are of immense and growing importance, and that this is no time to take backward steps along this line. I do not believe that any training in public health such as the average medical practitioner requires for his daily work can be given with less than . . . 150 hours. [53]

A compromise was negotiated and the curriculum committee reserved ninety hours for public health, to which Winslow was permitted to add ninety additional hours of public health electives which were to be spread through the last three years of the curriculum. In addition, the required program, originally offered in the second year and switched to the third year (where it was found to conflict with the clinical rotations), was also revised and placed in the first half of the fourth year, a time when students, according to Winslow (who had reconciled himself to the curriculum revisions), possessed "sufficient medical knowledge to realize what the modern public health campaign really may mean" [54].

During the early 1920s, Winslow continued his research in bacteriology, epidemiology, and statistics, focusing especially on communicable diseases and problems of industrial hygiene, including ventilation and dust hazards. The department served as a catalyst for public health reform throughout the state, and the health surveys prepared by Winslow and his faculty and students led to substantial improvements in public health organization. He also played a significant role in a legislative campaign for improved health laws in Connecticut, leading a successful campaign in 1917 for the passage of a bill creating the State Department of Public Health [55].

From the very beginning, Winslow was a valued member of the community of scholars at the medical school. When problems regarding Yale's pathology program came into the open, for example, Winslow wrote directly to Blumer supporting his colleagues who sought to remove a venerable but unproductive faculty member [56]. All matters of preventive medicine and industrial hygiene were assigned to him as a matter of course [57], and Winslow was always ready to speak out on any controversial issue, be it the hospital, the graduate school, or general medical affairs at the na-

tional level. He also served as an ally and close friend of Winternitz, assisting in the development of a human welfare program, which in 1928 emerged as Yale's Institute of Human Relations [58].

V

Successful in training candidates for the C.P.H and proud of the record of achievement of his Ph.D. students [59], Winslow remained singularly unsuccessful in convincing medical students at Yale to consider careers in public health. None, for example, enrolled in the one-year C.P.H. program after completing their studies for the M.D. degree.

In each of his major addresses, Winslow outlined the desperate need for medically trained public health officers. He summoned up the rhetoric of the evangelist, extolling, prodding, imploring, stabbing at one's conscience, reasoning always, but to no avail. Before an audience of scientists attending the annual meeting of the American Association for the Advancement of Science, he addressed these needs again and set forth a new definition of public health:

Public health is the science and the art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts 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 services for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will ensure to every individual a standard of living adequate for the maintenance of health; organizing these benefits in such a fashion as to enable every citizen to realize his birthright of health and longevity. [60]

The public health physician should not be a failed practitioner of medicine nor should he be a sanitary engineer or policeman. Instead, he should be a clinician providing diagnostic, therapeutic, and preventive services in a health center or public health department supported by a cadre of health personnel. It was for these reasons that Winslow's principal course, offered to fourth-year medical students, included lectures on community health organization, public health nursing, the hospital and dispensary, medical care organization, and the relation of the practitioner to the public health movement (which included a discussion of group medicine, health insurance, and the health center movement) [61].

Protest as he might, Winslow ultimately accepted the reality of the situation, but not before a final attempt to address what he had come to believe was the underlying cause of the problem. The reason why medical students did not pursue careers in public health had less to do with them, or even the standard medical school curriculum [62]. The real problem was how society had come to organize and finance health services in the United States.

In 1926, Winslow delivered his presidential address to the American Public Health Association. The speech was an ambitious attempt to capture the currents he had seen developing in society and to chart a new course for his parent organization and the health officers of the nation. APHA was at a crossroads and how they understood and adapted themselves to the "tendencies of the times" would determine just how much improvement in health would be seen in the years ahead. The principal issue was medical care:

Future progress in the reduction of mortality and in the promotion of health and efficiency depends chiefly on the application of medical science to the early diagnosis and preventive treatment of disease. . . . In the last analysis, it will be the duty of the health officer of the future to see that the people under his charge, in city or country, in palace or tenement, have the opportunity of receiving such services and on terms which make it economically and psychologically easy of attainment. [63]

The primary issue was the artificial barrier between prevention and cure. As long as a financial barrier existed between those who needed services and those with services to give, medical care would be alleviative after the event rather than truly preventive. The only solution was group practice, health insurance, or state medicine which would place the public health officer and the individual physician in an organized national health program. Winslow admitted that each proposal could legitimately be criticized, but one such plan, or a plan combining the best features of each, "was coming, as surely as the sun will rise tomorrow" [64].

He concluded his speech in characteristic lapidary fashion:

What we are doing here in our several ways is to build up on earth the city of God The means are prosaic—report cards and spot maps, culture tables and vaccines, clinics and nursing visits—and the results may appear only in a smaller decimal behind the death rate per thousand of the population. Yet the real fact behind it all is the saving of men, women, and children from suffering and from death; and the building into the social machinery of mankind of a technic which shall yield the same beneficent results throughout the coming years. [65]

In the next few years, Winslow joined a small group of health professionals who established the five-year program for the Committee on the Costs of Medical Care. He continued to offer his lectures to the fourth-year medical students, but gave increasing responsibility to his Yale associates as he more boldly entered in the 1930s the field of medical economics and medical care organization. He became the principal spokesman for CCMC's majority report and at times its sole supporter when the report was viciously attacked by the American Medical Association [66]. His writings at this time reveal that he never completely abandoned public health science (as he maintained a research interest, as Director of the Pierce Laboratory, in physiological studies, studies of ventilation, and industrial hygiene [67]), but it is evident that he increasingly accepted the venerable role of public health statesman, as had his mentors Sedgwick and Biggs.

VI

Winslow never succeeded in his main goal to convince medical students to go into public health careers, but owing to the unique locus of his department in the medical school, his ability to effect relationships with the clinicians who staffed and taught on the wards and outpatient departments, and his friendship with Winternitz [68], he successfully pervaded the "preventive spirit" and "broadened the vision" of the medical students as to the causative factors of disease and the social and environmental conditions which affected them [69].

Winslow was at Yale for almost thirty years. In that time he observed hygiene [70]

mature into preventive medicine; bacteriology merge with microbiology, pathology, and immunology; classic epidemiology evolve into clinical epidemiology [71]; chronic disease control supersede control of the communicable diseases; and public health assimilate the social dimensions of sickness and health and appropriate such disciplines as medical economics and medical care organization.

The department Winslow was invited to lead in 1915 is still evolving and is itself at a crossroads [72]. Its new direction will be based, as it was then, on the special qualities, educational experiences, and creative energies of its chairman, the unique structure of the university and its existing organizational units, political and financial realities, and historical accident. The department will nonetheless continue to flow in the same direction as established by Winslow but, as a former colleague of his said, "In order to build its own future, each generation must learn both to utilize its past and to escape it" [73].

ACKNOWLEDGEMENT

I am indebted to Elizabeth Thomson, Editor Emeritus, *Journal of the History of Medicine and Allied Sciences*, who is currently preparing a history of the Yale University School of Medicine, for providing me with copies of letters written by Blumer, Fisher, Mendel, and Henderson pertaining to the early proposal for the Department of Hygiene and Philanthropy which I discuss in this paper. I am also indebted to Judith Schiff, Chief Research Archivist, and Patricia Stark, Reference Archivist, Manuscripts and Archives, Yale University Library.

REFERENCES

1. Winslow C-EA: The place of public health in a university. *Science* 62:335-338, 1925; *see also* Winslow's Public health, The Past, Present and Future of the Yale University School of Medicine. New Haven, Printed for the University, 1922, pp 60-62, and Department of Public Health, Yale University, Methods and Problems of Medical Education. Tenth Series. New York, The Rockefeller Foundation, 1928, pp 1-11
2. *See* Hiscock IV: Public health courses in medical schools. *JAMA* 81:1897-1899, 1923; Rosen G: The school of public health: its derivation and objectives, Addresses, School of Public Health, University of North Carolina, Chapel Hill, NC, April 6-7, 1963. Chapel Hill, University of North Carolina, 1963, pp. 26-38; and Williams G: Schools of public health—their doing and undoing. *Milbank Mem Fund Q* 54:489-527, 1976
3. Devine ET: Social forces. *Charities and the Commons*, October 26, 1907, p 930
4. *See* Flexner S: Wickliffe Rose, 1862-1931. *Science* 75:504, 1937; Eitling J: *The Germ of Laziness*. Cambridge, Harvard University Press, 1981, pp 113-117; Williams [2], pp 491-492; and State Systems of Public Health in Twelve Southern States. Publication No 4. Washington, DC, Rockefeller Sanitary Commission, 1911, pp 3, 66-67
5. For information about Irving Fisher, *see* Miller JP: Irving Fisher, *Dictionary of American Biography*. Supplement Four. New York, Charles Scribner's Sons, 1974, pp 272-276
6. Irving Fisher to George Blumer, August 24, 1907. Records of the Dean, School of Medicine, Yale University. The Records of the School of Medicine may be found in Manuscripts and Archives, Yale University Library
7. Lafayette Mendel to Blumer, October 23, 1907, and Blumer to Yale Community, February 11, 1908. *Ibid*
8. Yandell Henderson to Blumer, November 1, 1907; Arthur T. Hadley to Blumer, April 16, 1908; Hadley to Fisher, March 13, 1908; and Fisher to Blumer, May 11, 1908. *Ibid*
9. *See, for example*, Blumer to Milton Rosenau, July 3, 1914; Rosenau to Blumer, September 21, 1914; Blumer to Pease, October 5, 1914; Pease to Blumer, December 17, 1914; Blumer to Jordan, October 5, 1914; and Jordan to Blumer, October 7, 1914. *Ibid*
10. Winslow was awarded an honorary Dr.P.H. degree from New York University in 1918
11. Additional biographical information about Winslow may be found in Fulton J: C.-E.A. Winslow, Leader in Public Health. *Science* 125:1236, 1957; Hiscock IV: Charles-Edward Amory Winslow, 1877-1957. *J of Bact* 73:295-296, 1957; Charles-Edward Amory Winslow, 1877-1957. *Am J Public Health* 47:153-167, 1957; and Viseltear AJ: Charles-Edward Amory Winslow, *Dictionary of*

- American Biography. Sixth Supplement. New York, Charles Scribner's Sons, 1980, pp 701–703. The Charles-Edward Amory Winslow Papers (hereafter cited as Winslow MSS) have been deposited in the Contemporary Medical Care and Health Policy Collection, Manuscripts and Archives, Yale University Library
12. SC Prescott, Professor of Industrial Biology at MIT and Sedgwick's memorialist, wrote this: "The desire to be of service, whether personal or public, dominated and enriched [Sedgwick's] whole life, for he was activated by an unique goodness and purity of spirit which transcended doctrine or creed. Few men have left such a heritage of good works, love, and inspiration." See Prescott SC: Life and work of William Thompson Sedgwick. *Technology Rev*: 1–17, 1921; Kelley ER: The public health activities of William T. Sedgwick. *Boston Med Surg J* 185:71–73, 1921; and Jordan EO, Whipple GC, Winslow C-EA: *A Pioneer in Public Health: William Thompson Sedgwick*. New Haven, Yale University Press, 1924
 13. Hill HW: *The New Public Health*. New York, Macmillan Co, 1922, p 8
 14. MIT Catalogues, Winslow MSS, IV/115/317
 15. Winslow C-EA, Sedgwick WT: I. Experiments on the effect of freezing and other low temperatures upon the viability of the bacillus of typhoid fever, with considerations regarding ice as a vehicle of infectious disease. II. Statistical studies on the seasonal prevalence of typhoid fever in various countries, and its relation to seasonal temperature. *Mem Am Acad Arts & Sci* 12:469–577, 1902
 16. Winslow C-EA, Prescott SC: *Elements of Water Bacteriology with Special Reference to Sanitary Water Analysis*. New York, John Wiley & Sons, 1904
 17. Winslow C-EA: *Elements of Applied Microscopy*. New York, John Wiley & Sons, 1905
 18. Winslow C-EA Winslow AR: *Systematic Relationships of the Coccaceae, With a Discussion of the Principles of Bacterial Classification*. New York, John Wiley & Sons, 1908
 19. E.O. Jordan to C.-E.A. Winslow, March 21, 1909. Winslow MSS, IV/115/305
 20. Lecture announcements, catalogues, and newspaper clippings in Winslow MSS, IV/115/304–306
 21. M.P. Ravenal to C.-E.A. Winslow, February 14, 1910. Winslow MSS, IV/115/304
 22. Wallace Attwood to C.-E.A. Winslow, January 22, 1910. *Ibid*
 23. Lecture Notes, February 15, 1910. Winslow MSS, IV/115/305
 24. Lecture Notes, March 16, 1910. *Ibid*
 25. Program, February 23, 1910. Winslow MSS, IV/115/306
 26. *Ibid*. A number of these points were similar to ones set forth by Charles V. Chapin, Superintendent of Health, Providence, RI. See Chapin: *The Sources and Modes of Infection*. New York, John Wiley & Sons, 1910
 27. Loew J: *Ethics in the Public Schools*. *The Am Teacher* 3:52, 1914
 28. C.-E.A. Winslow to Professor Ivin Sickels, January 23, 1911. Winslow MSS, IV/115/318
 29. Trustees Minutes, CCNY, June 16, 1914, p 95. I am indebted to Barbara Dunlop, Archives and Special Collections, CCNY Library, for archival materials relating to Winslow's activities at CCNY
 30. Winslow MSS, I/2/27–28
 31. Welch WH: Foreword, in Winslow, C-EA: *The Life of Hermann M. Biggs, Physician and Statesman of the Public Health*. Philadelphia, Lea & Febiger, 1919, p xii
 32. Duffy J: *A History of Public Health in New York City, 1866–1966*. New York, Russell Sage Foundation, 1974, pp 91–111
 33. Welch WH: Foreword [31], p xii
 34. See Viseltar AJ: *Emergence of the Medical Care Section of the American Public Health Association, 1926–1948*. Washington, DC, American Public Health Association, 1972, and C.-E.A. Winslow, his era and his contribution to medical care. In *Healing and History: Essays for George Rosen*. Edited by CE Rosenberg. New York, Science History Publications, 1979, pp 205–228
 35. For information about these candidates, see Williams RC: *The United States Public Health Service, 1798–1950*. Washington, DC, U.S. Public Health Service, 1951
 36. George Blumer to Arthur T. Hadley, April 3, 1915. Hadley MSS, I/9/163–164, and C.-E.A. Winslow to L.D. Bristol, April 30, 1915. Winslow MSS, I/5/102. The Arthur T. Hadley Papers have been deposited in Manuscripts and Archives, Yale University Library
 37. Russell Chittenden to C.-E.A. Winslow, October 6, 1915, Winslow to Chittenden, October 8, 1915. Winslow MSS, I/6/153. Winslow to Chittenden, October 30, 1915, and Chittenden to Winslow, March 15, 1917. Winslow MSS, I/6/151
 38. C.-E.A. Winslow to Charles Schuchert, October 13, 1915, and Schuchert to Winslow, October 16, 1915. Winslow MSS, IV/103/1
 39. See C.-E.A. Winslow to Arthur T. Hadley, October 8, 1919. Hadley MSS, 94/1851; Board of Permanent Officers Minutes, May 8, 1919, and Milton Winternitz to George Blumer, January 2, 1920. Winslow MSS, IV/104/50 See also Leo Rettger to Hadley, May 12, 1919. Winslow MSS, IV/105/66

40. For information about the administrative relationship and polite tension between the Scientific School and the university, see Chittenden R: *History of the Sheffield Scientific School of Yale University, 1846-1922*. Volume Two. New Haven, Yale University Press, 1928
41. George Blumer to Arthur T. Hadley, February 2, 1915, and April 3, 1915. Hadley MSS, I/9/163
42. Curriculum Committee of the Medical Faculty, April 16, 1919. Winslow MSS, IV/105/67
43. C.-E.A. Winslow, *The place* [1], p 336
44. *Ibid*, p 337
45. For additional information about public health degrees, see Report of the Committee of Sixteen, Standardization of public health training. *Am J Public Health* 11:371-375, 1921. Winslow served as chairman of this committee, which held its first meeting at Yale in 1919. See Winslow to Hadley, February 5, 8, 13, 25, and March 13, 1919. Hadley MSS, 94/1851
46. For example, Winslow invited W.F. Wells to discuss his "oyster work," Dr. Philip Van Ingen to discuss infant mortality, and Ella Crandell to discuss public health nursing. See letters dated February 15 and November 17, 1916. Winslow MSS, IV/103/1-2
47. Report [45]
48. Winslow C-EA: The untilled fields of public health. *Mod Med* 2:1-9, 1920, and The recruiting of sanitarians for the future service of the state. *Am J Public Health* 13:355-360, 1923
49. George Parmly Day to C.-E.A. Winslow, October 30, 1917. Winslow MSS IV/103/2, and Board of Permanent Officers Minutes, May 8, 1919. Winslow MSS IV/104/50
50. C.-E.A. Winslow to James R. Angell, November 16, 1927. Winslow MSS, I/2/38
51. C.-E.A. Winslow to Arthur T. Hadley, March 11, 1919, and Hadley to Winslow, March 12, 1919. Winslow MSS, I/13/324
52. C.-E.A. Winslow to George Blumer, December 10, 1919, and Winslow to Arthur T. Hadley, December 18, 1919. Hadley MSS, 94/1851
53. C.-E.A. Winslow to Arthur T. Hadley, June 11, 1919. Hadley MSS, I/9/166
54. C.-E.A. Winslow: Recruiting sanitarians [48], p 359
55. See offprints in *Contributions, Department of Public Health, Yale Medical School*. Volumes i-vii, 1917-1926
56. C.-E.A. Winslow to George Blumer, March 1, 1917, Blumer to Arthur T. Hadley, February 28, 1917, and John Churchman to Blumer, February 28, 1917. Hadley MSS, I/9/164
57. Board of Permanent Officers Minutes, April 3, 1919, and October 9, 1919. Winslow MSS, IV/104/50
58. Angell JR: *Yale's Institution of Human Relations*. Reprint from the *Yale Alumni Weekly* of April 19, 1929; *Yale Proposes to Study Man*. New Haven, The Human Welfare Group, 1929; Winslow C-EA: *Dean Winternitz & The Yale School of Medicine*. Address Delivered Before the Association of Yale Alumni in Medicine on 17 June 1935. New Haven, Yale University Press, 1935; Liebow A, Waters L: Milton Charles Winternitz, February 19, 1885-October 3, 1959. *Yale J Biol Med* 32:143-172, 1959; and Paul JR: *Dean Winternitz and the rebirth of the Yale Medical School in the 1920s*. *Yale J Biol Med* 43:110-119, 1970
59. Among those receiving Ph.D. degrees, for example, were Leonard Greenberg, "Industrial Dust and the Tuberculosis Problem"; I.S. Falk, "Studies in the Salt Action upon Bacteria"; and Margaret Justin, "Effects of Climate on Health: Correlation of Weather and Mortality as Shown in the Mortality Statistics of New York City for the Years 1883-1888." See C.-E.A. Winslow to Wilbur Cross, May 1, 1923, and January 3, 1924. Winslow MSS, IV/103/5
60. Winslow C-EA: *Untilled fields* [48], pp 6-7
61. *Ibid*, Department of public health [1], p 4
62. He did ultimately believe, however, that it may well have had something to do with the "type" of medical student admitted to medical school. "Medical students," he wrote in 1928, "form a selected group, dominated for the most part either by interest in the problem of caring for sick people or by a desire to do medical research. These are well marked psychological types and neither is the type which makes a successful health officer. If we are to fill the urgent need for health administrators we must attract to our public health schools, via our medical schools, a third type of man who is primarily interested in social organization and community leadership." *Ibid*, p 11
63. Winslow C-EA: *Public health at the crossroads*. *Am J Public Health* 16:1084, 1926
64. *Ibid*, p 1083
65. *Ibid*, p 1085
66. Winslow C-EA: *The recommendations of the Committee on the Costs of Medical Care*. *New Eng J Med* 207:1138-1142, 1932. See also *A program of medical care for the United States*. *Science* 77:102-107, 1933

67. *See, for example*, Winslow C-EA: Ventilation. Report of the New York State Commission on Ventilation. New York, EP Dutton & Co, 1923; Tuberculosis in dusty trades. *Survey* 54:353–355, 1925; (with HJ Shaughnessy) The alkaline isopotential point of the bacterial cell. *J Gen Physiol* 6:697–701, 1924; (with IS Falk) A Contribution to the dynamics of toxicity and the theory of disinfection. *J Bact* 11:1–25, 1926; (with HH Howell et al) Hazards from Tetraethyl Lead Gasoline. The Use of Tetraethyl Lead Gasoline in its Relation to Public Health. Washington, DC, *Pub Health Bull* 163:1–123, 1926; and Some relations of medicine to industry. *NY State J Med* 27:1246–1250, 1927. Winslow was also the first editor of the *Journal of Bacteriology*, serving from 1916 to 1943, and President of the Society of American Bacteriologists (1939). *See also* Winslow: The first forty years of the Society of American Bacteriologists. *Science* 91:125–129, 1940
68. Winternitz MC: Medical education at Yale, a summary of recent programs. *Yale Alumni Weekly*, January 29, 1932, pp 1–3
69. Winslow C-EA: Department of public health [1], p 3
70. One of Winslow's courses offered in the Department of Biology was given the title "Hygiene" and he immediately requested that it be changed. "The title Hygiene rather suggests that the course is devoted to instruction in personal behavior, brushing the teeth, avoiding overeating, and the like, which are not very attractive subjects to a healthy boy. As a matter of fact, the course ever since I have taken it over has been devoted mainly to the broader questions of public health, the municipal problems of water supply, food supply and waste disposal, the functions and place of the modern public health department, and the organization of medical and nursing services. The subject as I conceive it is one which ought to appeal as a part of a general training for citizenship and service." C.-E.A. Winslow to Gustave Bruener, June 2, 1919. Winslow MSS, IV/103/3
71. Paul JR: Clinical epidemiology. *J Clin Invest* 17:539–541, 1938
72. *See* Paul JR: Preventive medicine at the Yale University School of Medicine. *Yale J Biol Med* 13:253–258, 1940, and Acheson RM, Payne AM-M: Preventive Medicine at the Yale School of Medicine, 1950–1965. *Milbank Mem Fund Q* 45:287–301, 1967
73. Davis M: *Medical Care for Tomorrow*. New York, Harper & Brothers, 1955, p 434