

Chapter 1

“TO ROB CONSUMPTION OF ITS TERRORS”

Germ Theory, Hermann Biggs, and the “New” Tuberculosis

Of all the neighborhoods in early twentieth-century New York City, how did a four-acre parcel bounded by Cherry, Catherine, Hamilton, and Market Streets become recognized as a locus of tuberculosis infection? The answer, in part, rests upon two major scientific and medical developments that unfolded through the late nineteenth century: the advent of germ theory, which redefined tuberculosis as a bacterial, and potentially preventable, threat to public safety; and the corresponding rise of public health agencies, with their increasingly sophisticated and aggressive methods of intervention. In New York City—as in other large and well-established American cities during this period—these developments took shape against an inhospitable backdrop of municipal instability and corruption, as well as fierce resistance from within the medical community.¹

A key figure standing at the nexus of these developments was Hermann Biggs, an ambitious New York City bacteriologist and public health administrator whose generation represented a dramatic break with nineteenth-century sanitarians and clinical observers. Having quickly grasped the significance of European microbiological breakthroughs and their implications for infectious disease prevention in America, Biggs spent much of his early career promoting the utility of the bacteriological laboratory through well-organized campaigns against cholera, diphtheria, and tuberculosis. Over the course of these campaigns, New York City’s public health services expanded to include educating the community, analyzing culture specimens, manufacturing and distributing vaccines and antitoxins, examining schoolchildren, and closely monitoring the spread of infectious diseases. In later decades, Biggs’s colleagues would praise these efforts to apply scientific advances to practical ends, bringing “bacteriology to the people.”²

Biggs’s success in converting bacteriological discoveries into public policy rested upon not just his professional expertise but also his talent for cultivating goodwill among municipal leaders, medical professionals, and the

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public.³ For much of the twentieth century, historians attributed Biggs’s tireless promotion of public health objectives to selfless, visionary civic ideals; recent scholars have approached his work more skeptically, emphasizing both his political shrewdness and the fact that his public health campaigns also advanced his own professional ambitions.⁴ In this chapter, which places Biggs’s antituberculosis efforts within the broader context of his medical training and early career, I argue that his efforts reflected the evangelical zeal of up-and-coming public health workers who now viewed infectious diseases as preventable—and subsequent deaths from these diseases to be morally inexcusable. In striving to alert political leaders, medical colleagues, and the public to the newfound dangers of tuberculosis, Biggs relied on biased surveillance and data-gathering methods that invariably aligned contagion with working-class populations and neighborhoods. When these methods revealed an alarming cluster of tuberculosis cases on Cherry, Catherine, Hamilton, and Market Streets, Biggs began including the block in his lectures and publications as a powerful argument for expanding the powers of public health in American cities: a promotional strategy that redefined the neighborhood as a “plague spot” requiring expert intervention.

FROM CONSUMPTION TO TUBERCULOSIS

Tuberculosis, as we know it today, is an airborne bacterial infection primarily targeting the lungs. Among healthy people, the immune system acts to “wall off” the bacteria by encasing them in lung tissue (tubercles). The bacteria can remain dormant indefinitely inside these tubercles, permitting their human hosts to lead active and productive lives. Among immunologically compromised people, the bacteria can breach these tubercles and begin spreading throughout the rest of the lungs and body. The course of active tuberculosis includes fever, night sweats, fatigue, diminished appetite, and internal hemorrhaging as the patient starts coughing up blood. In the days before the bacterial cause was known, people defined the disease in terms of its most common and visible effects. These effects, chiefly —paleness and emaciation, formed the basis of the disease’s earlier names: phthisis, a Greek term meaning “to waste away”; consumption, which captured impressions of the illness consuming the victim from within; and the Great White Plague.⁵

Tuberculosis constituted the biggest killer in industrialized countries during the nineteenth century, most notably among people in their working and reproductive years.⁶ It was believed to have infected between 70 and 90 percent of urban Europe and North America by the late nineteenth century, and accounted for one-seventh to one-quarter of all deaths: more than ninety-one thousand in 1880.⁷ Yet until Robert Koch discovered the bacteria that caused tuberculosis in 1882, Europeans and Americans alike regarded the

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disease with little trepidation. The endemic nature of the disease across all classes of society, and its slow, gradual course in most active cases, conferred a dignified respectability upon consumption that contrasted favorably with fast-moving, “dirty” killers such as cholera or dysentery. “We have become so accustomed to [consumption],” lamented T. Mitchell Prudden, a bacteriologist and future associate of Biggs at the New York City Department of Health (NYCDOH), “that it is taken as a matter of course—one of the inevitable ills of life.”⁸

In art, fashion, opera, and literature, the pale skin, flushed cheeks, and wasted physique of the consumptive embodied the gothic romanticism of the period, which assigned a redemptive, even transcendent quality to suffering and early death. As the material body wasted away, people believed that spiritual purification was taking place, liberating the individual’s genius and creativity. Even the clinical descriptions in nineteenth-century medical textbooks conflated consumption with a fragile, translucent beauty and uncommon intelligence. One example from 1884 described the consumptive look as “tall, slim, erect, delicate looking,” with “a pretty oval face, a clear complexion, bright eyes and large pupils”; the patient’s skin was “very thin, soft and delicate,” revealing the bluish veins underneath; the hair was “fine and silky, often light, the eyelashes being long.” Consumptive types “cut their teeth early, and are generally precocious and clever, walking and talking soon. They are excitable and active in body and mind.”⁹

Germ theory, a result of the efforts of Koch, Louis Pasteur, and other European scientists to forge direct connections between specific diseases and microorganisms, introduced a gradual shift in how people viewed the disease.¹⁰ *Phthisis* and *consumption* were gradually replaced by *tuberculosis*, a term that conveyed microbial menace rather than romantic effect. The cultural allure of consumption began declining among middle-class Americans, in favor of a hearty athleticism promoted through cycling, tennis, the scout movement, and other forms of active, outdoor recreation.¹¹ For medical professionals, successfully diagnosing tuberculosis no longer required a thorough, intimate knowledge of the patient and his or her family and lifestyle; now it required only the presence of the bacillus, for which doctors needed access to cultures, microscopes, and other tools found only in laboratories.¹² These developments strengthened the authority of bacteriology and the public health establishment while at the same time accentuating generational and class divisions within the late nineteenth-century American medical community. At this critical juncture when medicine was completing the transition from trade to profession, younger, university-trained professionals shared the field with older, provincial healers who had acquired their education and credentials through on-the-job experience. This distinction mattered little throughout much of the nineteenth century, given the substandard quality of

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medical education as a rule.¹³ One of Biggs’s contemporaries in New England, William T. Sedgwick, recalled his medical training with a mixture of disdain and bemusement. “Even our best medical schools welcomed without any educational requirements whatsoever all students who could pay,” he stated, adding that a standard degree reflected a year’s worth of lectures, “the only laboratory . . . being the dissecting room.”¹⁴

For Sedgwick and other young medical professionals, germ theory marked the true beginning of their professional training. “Before 1880 we knew nothing,” Sedgwick declared. “After 1890, we knew it all; it was a glorious ten years.”¹⁵ During this brief span, dozens of feared and familiar maladies became detectable not just through their effects on human beings but by the microbial agents causing them: *Mycobacterium tuberculosis* (tuberculosis), *Vibrio cholerae* (cholera), *Corynebacterium diphtheriae* (diphtheria), *Salmonella Typhi* (typhoid fever), and *Streptococcus pyogenes* (scarlet fever).¹⁶ With each new bacteriological discovery, the field of medicine transformed further from complex and uncertain clinical terrain into a hunting ground with clearly defined targets: a development that germ theory enthusiasts hailed as nothing short of miraculous. “The mysterious veil which has for so long hung over some of the most widespread and terrible of human diseases is gradually being drawn aside,” Prudden rejoiced, revealing “particulate beings . . . things which we can see and handle and kill.”¹⁷ Renowned pathologist Woods Hutchinson recalled decades later, “Our foe had come down out of the clouds and was spread out in battle array before us.”¹⁸

HERMANN BIGGS, BACTERIOLOGY, AND THE PROFESSIONALIZATION OF MEDICINE

This dynamic decade of scientific advances and medical professionalization had profound influences on Hermann Biggs’s professional training and career. Born in the industrial village of Trumansburg, New York, in 1859, Biggs hailed from a line of prosperous, old-stock merchants and manufacturers.¹⁹ His active mind, coupled with a delicate physical constitution, helped mold the personality traits that later served him well as a public health administrator: patience, persistence, pragmatism with compromising and delegating tasks, and an understated charm that nevertheless exerted a powerful influence on people around him. Biggs “was never the least pushing nor self-assertive,” recalled an old college friend; “nevertheless, he had the peculiar quality of making his presence felt . . . one always knew when he entered a room or any small assembly. And when any subject was under discussion, one instinctively turned to him for his opinion, which nine times out of ten was taken as final.”²⁰

Biggs followed Koch’s research closely during his undergraduate years at

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Cornell in the early 1880s, hailing the tuberculosis bacillus as “the grandest discovery of the age.”²¹ Later, at Bellevue Medical College in New York City, he witnessed firsthand the generational rift that germ theory wrought among faculty members. Biggs gravitated toward William T. Welch, a young professor recently returned from Europe who, along with Prudden, offered some of the first bacteriology classes in the United States.²² Many of Welch’s senior colleagues still viewed germ theory with skepticism, some dismissing it outright as an unsubstantiated hoax. “People say there are bacteria in the air, but I cannot see them,” Bellevue professor Alfred L. Loomis once quipped to a tittering lecture hall of medical students—several of Welch’s protégés among them.²³

While most late nineteenth-century critics of germ theory no longer disputed the existence of bacteria, or the correlation of specific bacteria with specific diseases, accepting a direct causal link between microorganisms and disease was neither smooth nor automatic.²⁴ Their wariness toward “bacteriomania” stemmed from an impulse to defend not only their authority and expertise but also the validity of their own experiences with sickness and healing.²⁵ For clinicians who were accustomed to considering a host of variables before arriving at a diagnosis, focusing exclusively on microbes must have appeared appallingly reductionist—a shortsighted and reckless disregard for observation skills honed over centuries of practice.²⁶ By the same token, germ theory proponents dismissed clinicians’ abilities as dangerously limited without a working knowledge of bacteriology. “The doctor who is ignorant on the subject is greatly handicapped from a practical standpoint,” noted one editorial in a pioneering bacteriological journal; “a physician without a microscope,” declared another commentator, “is like a man without eyes.”²⁷ Within the next few years, Loomis and likeminded skeptics would move toward a cautious, measured acceptance of germ theory in their public statements; during Biggs’s brief training at Bellevue, however, Welch and Loomis represented the medical profession’s past and future competing side by side.²⁸

BIGGS AND PUBLIC HEALTH IN NEW YORK CITY

Biggs cast his lot firmly with the bacterial revolution. After completing his undergraduate degree and medical training in only three and a half years, he joined a growing pilgrimage of American medical professionals to Germany for a firsthand look at the bacteriological research occurring there.²⁹ Many of these sojourners returned to help lead the bacteriology laboratories emerging among medical schools, universities, hospitals, and health departments. Biggs was among the first of these, taking control of Bellevue Hospital’s bacteriology laboratory by 1886, at which point, by his own admission, “there was practically no bacteriological work being done in this country.”³⁰

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By the early 1890s Biggs was working at the NYCDOH, one of the first municipal public health agencies to employ the “new science” against a wide array of contaminants lurking in food, water, and populations.³¹ Its brand-new bacteriology laboratory had grown out of the cholera pandemic that threatened New Yorkers in 1892. By culturing bacteria from sick passengers aboard detained immigrant vessels, Biggs and his fellow bacteriologists confirmed that the passengers suffered from the same cholera strain ravaging Europe. Armed with this information, city officials moved quickly to disinfect and quarantine most of the passengers on a nearby island until the danger of contagion had passed. Of the 141 deaths resulting from the cholera outbreak, only nine took place within the city itself—an outcome that Biggs credited to the superior speed and accuracy of laboratory science over clinical observation methods.³²

While Biggs and his laboratory received credit for helping New Yorkers avert a major public health crisis, the relative infrequency of cholera outbreaks meant that he would have to broaden the laboratory’s objectives to ensure its long-term survival. New York’s health department, like those of many other late nineteenth-century American cities, was overseen by a municipally appointed board of laypeople—often prominent businessmen whose priorities reflected those of the political party in power. In the early 1890s this power emanated from Tammany Hall, the city’s largest democratic party. Controlled by boss Richard Croker, the party drew the bulk of its strength from the ever-growing immigrant population. In exchange for votes, an elaborate, far-reaching chain of command provided working-class newcomers with staples like food and coal, financial assistance in times of trouble, and access to steady jobs. In an era before these vital services became embedded formally within government agencies, funding usually came from graft: bribes that saloons, brothels, and other businesses paid to city inspectors and law enforcement in order to continue operating illegally. When mayoral administrations changed, so did the makeup of the city’s workforce, as victorious candidates sought to reward their supporters with a place on the public payroll. This system of patronage, applied to the health department, sometimes resulted in skilled and seasoned professionals being pressured to move aside for less qualified people whose political connections outweighed theirs.³³

To shield his laboratory from changing political fortunes, Biggs employed a combination of effective results, shrewd networking, and successful publicity campaigns.³⁴ After the cholera scare subsided, Biggs turned his attention to diphtheria, a common bacterial infection that killed more than a thousand New Yorkers each year in the 1890s. Biggs’s campaign was threefold: offering free diphtheria screenings to physicians; tracking the spread of cases through disease maps and placards displayed in patients’ homes; and adminis-

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11. Hermann Biggs. Portrait taken by New York photographer Benjamin Falk, ca. 1880s. Photograph held in the collection of the author.

tering antitoxin, a recent European breakthrough that increased a diphtheria patient's chances of recovery if given in the early stages.³⁵ If cholera broke the ground for New York's municipal bacteriological laboratory, Biggs credited diphtheria with laying the foundations.³⁶ In 1896 his laboratory examined twenty-five thousand cultures for diphtheria, manufactured and distributed seventeen thousand vials of antitoxin, and performed countless house inspections and disinfections. These staggering numbers required larger facilities and a larger staff, which now included "25 physicians, 1 chemist, and 2 veterinarians, in addition to clerical and laboratory assistants and attendants."³⁷

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The fact that Biggs’s diphtheria program experienced this rapid growth through a rapid succession of Tammany and anti-Tammany administrations reflects his aptitude for gaining the confidence of people in power, regardless of political affiliation.³⁸ “He was an excellent judge of human nature,” remarked one of his associates, “and frequently seemed to know men better than they knew themselves.”³⁹ Much of the program’s success also stemmed from Biggs’s initiative and willingness to take risks. Unwilling to wait until the city apportioned its next budget, Biggs secured much of the initial funding for producing diphtheria antitoxin through private donors. He then solicited public support through the New York *Herald*, which responded with a fundraising campaign that convinced city officials of the political expediency of supporting the program.⁴⁰ Within four years, Biggs publicly credited his laboratory’s diagnostic procedures and antitoxin supply with lowering the city’s diphtheria death rate by 40 percent. By then, the laboratory generated enough surplus antitoxin to sell to medical facilities across the country; this provided Biggs with a steady stream of independent funding, further insulating him from the political corruption that plagued his and other health departments during this period.⁴¹

Biggs’s early years in the city health department demonstrated his enthusiasm for bacteriology and laboratory methods, his flair for cultivating the support he needed for his programs, and his belief in the ultimate authority of the public health establishment in preventing disease among New Yorkers.⁴² As Biggs’s prestige increased, so did the territorial hackles he raised among individual practitioners regarding “whose diagnosis of a private case of sickness is to stand—that of the physician . . . or that of the board whose examiners have made a bacteriological examination in connection with it.”⁴³ Each of these patterns would figure prominently in Biggs’s next campaign against a common killer: tuberculosis.

GERM THEORY ON TRIAL

Even though tuberculosis killed more Americans than any other disease during the late nineteenth century, Koch’s discovery of the tubercle bacillus made little impact on the American medical community initially. Unlike fast-moving epidemics like cholera, influenza, or smallpox, the selectivity and gradual progression of active tuberculosis discouraged any direct associations with contagion: “In acute diseases,” observed Philadelphia physician and antituberculosis pioneer Lawrence Flick, “it is comparatively easy to note the length of time which elapses between exposure and determining symptoms of the disease . . . but in chronic diseases [such as] phthisis, this is no easy matter.”⁴⁴ Reluctant medical professionals demanded more compelling evidence before breaking with their traditional views of consumption as a product of internal imbalance and disharmony.⁴⁵ In the years immediately following Koch’s discovery,

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critics continued to define the tuberculosis bacillus conservatively as a mere accompaniment to “certain deteriorative changes in organic matter . . . possessing no causative relations whatever.” Cautioning their colleagues against a “too ready acceptance of the bacillus doctrine,” they charged early germ theory proponents with being hasty, overzealous, and naïve, singling out younger pathologists for their “regular fanaticism” in sacrificing scientific method for “imagination and speculation.”⁴⁶

Meanwhile, these younger pathologists grew impatient with the reluctance of physicians and politicians to apply recent scientific breakthroughs to saving lives. “The germ theory—now no longer a theory in the case of tubercular consumption—tells us that we have to do with a contagious disease,” argued Charles V. Chapin, superintendent of health for Providence, Rhode Island, in 1888. For Chapin and many other early public health crusaders, this now incontrovertible fact placed the power of prevention in human hands. “Now there is no theoretical reason why a purely contagious disease like tuberculosis cannot be exterminated,” Chapin declared. “If we can prevent the spread of contagion at all, we can prevent it entirely.”⁴⁷ Biggs, also convinced that “the most common and fatal disease which prevails in New York is both communicable and preventable,” expressed similar frustrations six years later in the popular journal *Forum*. “There can be and is no difference of opinion among those who are conversant with the scientific facts,” Biggs argued in his article, titled “To Rob Consumption of Its Terrors.” He found particularly irksome the presumption circulating among germ theory detractors that “germs, as active agents in the production and dissemination of disease, really exist only as phantoms in the minds of over-imaginative and impractical bacteriologists.”⁴⁸

Biggs launched his campaign against tuberculosis in 1893 using the same multipronged strategy that he had employed successfully against diphtheria: surveillance, education, disinfection, and isolation.⁴⁹ To find the number and distribution of tuberculosis cases in the city, he proposed new measures requiring all public institutions to report the names and addresses of consumptive clients to the health department, and requested that private physicians do the same with their own patients. To encourage widespread cooperation, Biggs circulated informational pamphlets, wrote articles for popular publications, and offered physicians free screenings of sputum samples for arriving at a decisive diagnosis.⁵⁰

Physicians responded less enthusiastically to these measures than they had during Biggs’s diphtheria campaign, largely because they perceived little to gain from reporting a disease that not only lacked consensus on communicability but also an effective treatment in any case.⁵¹ On the contrary, they perceived much to lose, both for themselves and for their patients. Early antituberculosis campaigns, in their efforts to purge the disease of all prior

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romantic associations, conveyed a degree of alarmism that effectively stigmatized “consumptives” as menaces to society.⁵² This “phthisiophobia,” as renowned specialist Sigard Adolphus Knopf once described it, discouraged such people from seeking help for fear of losing their jobs, homes, and relationships.⁵³ The prolonged and often terminal course of tuberculosis meant that patients endured this stigma indefinitely, making the implications of reporting different from “scarlet fever, diphtheria, and other infectious or contagious diseases which ran a short course,” one doctor explained. “When we reported a case of tuberculosis, it was practically for life.”⁵⁴ Moreover, the fact that many life insurance policies excluded tuberculosis from policyholders’ coverage rendered an accurate diagnosis not only scandalous but also financially devastating for their families—and, by extension, their physicians.⁵⁵ Anxious to preserve the hopes, confidentiality, and steady business of their consumptive patients, many physicians avoided reaching a firm diagnosis for as long as possible; consequently, they complied with reporting their cases slowly and reluctantly.⁵⁶

PLOTTING PATHOLOGY: BIGGS’S TUBERCULOSIS MAPS

Fully cognizant of his colleagues’ skepticism and their reasons for it, Biggs employed a diplomatic blend of education, persuasion, and empirical evidence to gain their support in his speeches and writings on tuberculosis throughout the 1890s. Phrases he used often—“it has been proven without a doubt,” “it has been abundantly established,” “it has been shown experimentally,” “it is a well-known fact,” “it has become evident,” “there is every reason to believe”—projected scientific authority and confidence in both the communicability of tuberculosis and the rightful place of public health departments at the head of community prevention efforts.⁵⁷ Meanwhile, Biggs plotted reported cases on sectional maps that included the block and house where tuberculosis sufferers lived. Biggs took his inspiration from Flick, who had mapped a variety of diseases in an impoverished ward of Philadelphia over twenty-five years. Over time, Flick discovered that tuberculosis cases appeared in clusters “identically the same as that of typhoid fever, smallpox, scarlet fever, and diphtheria,” reinforcing the idea that tuberculosis spread only “by contact, by association, or by living in close proximity.”⁵⁸ Following Flick’s example, Biggs intended to drive home in visual terms the extent of tuberculosis’s grip on the city. With the support generated from those results, he hoped to extend the reach of his tuberculosis-control program with tougher case-reporting policies and a taxpayer-funded sanitarium for isolating the city’s poorest consumptives.

Biggs focused his surveillance efforts on the tenement districts, where tens of thousands of working-class New Yorkers lived in overcrowded rooms

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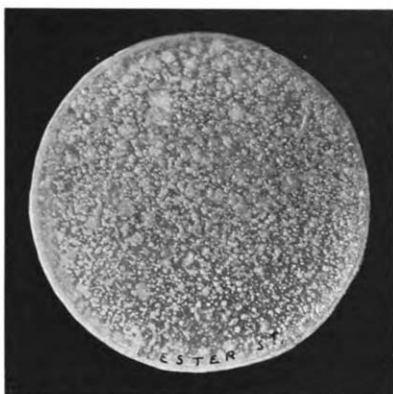


FIG. 18.—Hester Street, New York.

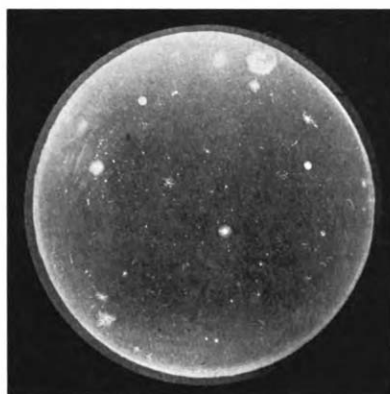


FIG. 19.—Madison Avenue and Sixty sixth Street, New York.

1.2. These photographs, published in a medical textbook from 1906, show the bacterial growth in Petri dishes containing samples from Hester Street on the Lower East Side (left) and a wealthier uptown neighborhood (right). “The former is a very unclean district,” John Huber deduced from the comparison; “the latter, very salubrious.” Reprinted from John B. Huber, *Consumption: Its Relation to Man and His Civilization* (Philadelphia: J. B. Lippincott, 1906), 83–84.

without sufficient air and sunlight.⁵⁹ This selective approach built upon recent experiments that found the tubercule bacillus could survive indefinitely in dark and ill-ventilated environments, which suggested that tenements provided ideal reservoirs for the disease.⁶⁰ Biggs’s preoccupation with tenement districts also reflected the ongoing reluctance of private physicians to cooperate—a situation that resulted in most reported cases coming from public institutions frequented by the poor.⁶¹ Aware of the skewed nature of his results, Biggs proceeded anyway, eager to make inroads in whatever direction offered the least resistance. “It was not deemed wise at first . . . to make it obligatory for physicians to report cases,” he explained to colleagues the following year; by contrast, “it was comparatively easy to obtain reports from public institutions, which would give the most numerous class of patients and those whom it was most important to instruct.”⁶²

From a logistical perspective, restricting public health oversight to areas believed to contain the largest numbers of cases represented a pragmatic and efficient use of resources. Strategically, it allowed Biggs to pursue his ambitious agenda without arousing the ire of private practitioners and their wealthier patients. In practical terms, this meant that Biggs’s early tuberculosis-control efforts depended upon the involuntary participation of consumptives who could not afford to hire their own physicians. While Biggs later admitted to colleagues that such unequal treatment would be “undemocratic,

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1.3. An early example of a tuberculosis map from New York’s Lower East Side, compiled from case reports gathered under the direction of Hermann Biggs, New York City’s chief bacteriologist. Each dot represents one tuberculosis death occurring between 1894 and 1899. Reprinted from NYCDOH, *Annual Report of the Board of Health of the Health Department of the City of New York for the Year Ending December 31, 1896* (New York: Martin B. Brown, 1897). Courtesy of the New York City Municipal Library.

and probably illegal” if coded into official policy, he nevertheless maintained that “sanitary authorities may use their discretion . . . depending upon the danger which they conceive exists as far as the public is concerned.”⁶³ In his urgent quest to eliminate needless deaths, Biggs clearly viewed working-class consumptive people as more of a public menace than wealthy ones, and consequently less entitled to having their autonomy and privacy taken into account. Other compulsory notification advocates viewed this dual, class-oriented approach as sensible and fair. “The wealthy are abundantly able to take care of themselves,” argued Flick. “The poor are not, and it will be no hardship to them or interference with their private rights to help them to protect those near and dear to them against so fatal a disease.”⁶⁴

Within several years, the case dots accumulating on Biggs’s maps formed clusters bearing strong resemblances to Flick’s in Philadelphia.⁶⁵ Skewed data gathering ensured that these clusters appeared only in tenement districts, where “the lowest class of Italians, Irish, Russian Jews, Greeks, [and] Chi-

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nese” lived in “overcrowded houses, rear tenements and dilapidated buildings.” Biggs’s maps, forged in the pre-germ-theory belief that “ignorance, poverty, and filth furnish[ed] a suitable soil for all infectious diseases, as well as tuberculosis,” had succeeded in reinforcing that belief using scientific, post-germ-theory methods.⁶⁶

By 1897, when Biggs estimated the number of active tuberculosis cases in New York to be twenty thousand, he felt the time had come for more aggressive tactics. Seizing upon the telltale clusters generated from the disease maps as irrefutable evidence that tuberculosis was contagious, he called for the NYCDOH to “assume a more complete and comprehensive control” over tuberculosis prevention, starting with making case reporting universal and compulsory for all physicians.⁶⁷ Representatives from New York’s medical community responded swiftly, rejecting compulsory notification of tuberculosis as “mistaken, untimely, irrational, and unwise.” Their subsequent complaint—that the health department “had only to declare a disease infectious in order to take charge of it”—reveals their uneasiness about germ theory’s power to shape public policy in ways that undermined their own autonomy.⁶⁸ Mandatory tuberculosis case reporting introduced additional levels of government oversight into the traditional patient-healer relationship; it also placed public health officials “in the rather equivocal position of dictating to the profession . . . and of creating a suspicion of an extra bid for public applause by unduly magnifying the importance of its bacteriological department.”⁶⁹ The city’s medical societies called upon state legislators to formally restrict the powers of public health officials.⁷⁰

Biggs, using his time-tested approach of education, persuasion, and empirical evidence, overcame this organized resistance to compulsory notification within a matter of months. In prominent medical talks featuring the most heavily case-spotted disease maps, which “argue[d] more forcibly for the infectious and communicable character of this disease than could any words,” he defended the NYCDOH’s imperative to act against tuberculosis.⁷¹ Meanwhile, his steady assurances of gradual and selective enforcement enabled leaders of New York’s leading medical organizations to reach a compromise that left the new compulsory notification policy unchallenged, provided that public health workers continued to apply it gently.⁷²

TRANSITIONAL ETIOLOGIES IN TUBERCULOSIS

As Biggs harnessed his tuberculosis maps to promote more aggressive public health policies, the dot clusters forged powerful visual associations between tuberculosis and the structures housing the people infected with it. “Tuberculosis is not uniformly diffused through a community,” observed Arthur Guerard, one of Biggs’s subordinates who helped compile the maps, in 1896;

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instead, it was “confined within . . . certain streets and within the walls of certain houses.”⁷³ Like many tuberculosis experts, Knopf attributed these clusters to a vicious circle of transmission between “careless tuberculous patients [who] have lived for years in these houses,” and “the soil on which these houses have been built, or the manner in which they have been constructed . . . [being] of a nature to retain the tuberculous infection indefinitely.”⁷⁴ Flick, whose block-by-block disease maps of Philadelphia gave rise to the theory originally, also came to envision houses as passive receptacles and incubators of contamination. “Consumption may well be termed a house disease,” he declared in 1904; “without the house, it would not exist.”⁷⁵

Two critical, related elements fueling the house infection concept were sputum and dust. Prudden explained in 1889, “Thousands of consumptives are walking about the streets . . . who discharge the infectious material coughed up from the lungs upon the pavements or floors. This dries . . . and takes its place among the rest of the floating dust of the air.”⁷⁶ Many late nineteenth-century tuberculosis specialists believed this dust to be dangerous, citing recent laboratory findings and anecdotal examples in which tuberculosis bacilli remained active in dried sputum for weeks and even months.⁷⁷ Some, like Boston physician Edward O. Otis, became preoccupied with people spitting in public places. In 1898, he recalled counting “193 expectorations in less than an eighth of a mile; in another locality where fewer people pass I counted 211 in rather more than that distance.”⁷⁸ Other experts focused on the dangers that tuberculosis bacilli presented inside the home. In *Dust and Its Dangers*, Prudden speculated on the “living and virulent germs . . . clinging to the walls and furniture and bedding and handkerchiefs of consumptive persons, and in the dust of the rooms in which they dwell.”⁷⁹

The perceived pathological dangers of dust and spit began receding in significance by the 1900s, as researchers refined their understanding of how tuberculosis transmission worked.⁸⁰ During the 1880s and 1890s, however, sputum and dust provided common ground for sanitarians and germ theory proponents alike. Both groups regarded human bodies as sites of contamination; the germ theory model merely superimposed living bacteria upon the same filth that sanitarians had long associated with disease, ignorance, and weakness of character.⁸¹ Likewise, both groups advocated higher standards of cleanliness and hygiene, which imposed harsh new layers of scientific authority over individual behavior in ways that disproportionately targeted the poor. Convinced that “the sputum alone . . . is the source of danger,” Biggs urged New York to outlaw public spitting—the first of many American cities to do so.⁸² Although violators of antisputting ordinances hailed from all classes, the poor were least likely to be able to afford a typical fine of two dollars, and thus most likely to go to jail.⁸³ These new and exacting standards of cleanliness also increased the physical and emotional strain on housekeepers; for tenement

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dwellers struggling to keep deadly germs at bay in dark, close quarters without running water, the task was difficult if not impossible.⁸⁴

The NYCDOH had multiple opportunities to observe the role of structural deficiencies in “infected houses.” Its own Sanitary Bureau, created in 1866 to detect and eliminate public health hazards anywhere in the city, conducted thousands of tenement inspections and disinfections every year.⁸⁵ In 1896, Guerard suggested that current public health tactics did not go far enough in tenement houses with multiple cases of tuberculosis. “Such houses would seem to be permanently infected,” he observed, citing multiple anecdotal examples of healthy people contracting tuberculosis after moving to a dwelling where multiple cases had already occurred. He advocated their full-scale renovation, “or, better[, that they be] condemned and torn down. They are old houses, in bad sanitary condition, some of them rear tenements, and densely packed with the poorest and filthiest class of people.”⁸⁶

This progression from “house infection” to “permanent infection” reflected public health workers’ growing awareness of the true scope of the tuberculosis problem. Disinfection measures could wipe out the tubercle bacillus, but not the crowded, substandard living conditions favoring its transmission from person to person. Informational pamphlets and lectures, however expertly presented, still foundered on barriers of language, culture, and education. Isolation proved elusive in a city with few hospital beds set aside for impoverished tuberculosis patients, and an unstable municipal leadership more concerned with dispensing patronage than with building sanitariums.⁸⁷ Faced with these limitations, public health leaders began expanding their tuberculosis-prevention campaigns to include broader social and environmental concerns. This shift would bring them into an alliance with the housing reform movement, the growth of which paralleled the rise of public health throughout the 1890s. In the absence of an immediate cure for tuberculosis, both groups agreed that the bacillus needed to be targeted at its source; authoritative, objective-looking statistics and maps, all compiled from tenement districts, ensured that this source would be pictured as squalid, overcrowded slum dwellings.⁸⁸

When viewed within a broader context of late nineteenth-century developments, the concept of lung blocks first emerged from the etiological confusion, political instability, and medical professionalization occurring in large American cities. All three of these trends manifested most visibly in New York. As newly minted bacteriologists pursued the tubercle bacillus in the air, on the street, and inside buildings, they projected new and invisible dangers onto common and familiar patterns of daily life. When communicating these newfound threats to their colleagues and the public, germ theory proponents often fell back upon sanitarian models that linked disease with miasmas, filth, poverty, and moral failings. This engrafting of new knowledge on to older

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mindsets created favorable conditions for the theories of tuberculous dust and house infection to take shape. By the 1900s several influential public health leaders had begun calling the dangers of dust into question. “We know that the germs themselves are much more rarely air borne than had been thought [previously],” Chapin observed in 1902; he discredited the idea altogether several years later, citing insufficient evidence.⁸⁹ The decades immediately preceding this shift constitute a brief window in which the filth and germ theories of disease competed for legitimacy and dominance. During this fluid period of transition, public health agencies began expanding their powers on the belief that tuberculosis could be prevented and even eradicated through education, isolation, and disinfection campaigns of unprecedented scale and scope. These efforts required generous resources, which in turn depended upon the shifting allegiances and priorities of municipal leaders. They also depended upon the cooperation of private physicians, many of whom resisted state-sponsored intervention as a threat to their autonomy and livelihoods. In this unstable and politically charged environment, forging a successful public health career with the city required proficiency in adapting to changing power structures as well as changing technologies.

Hermann Biggs navigated this complicated terrain successfully through a combination of savvy public relations, astute behind-the-scenes diplomacy, and pragmatic willingness to make the most of every opportunity for advancing his agenda. A close examination of Biggs’s early career, and his tuberculosis campaign in particular, suggests that his actions stemmed not from personal ambitions but rather from the deep-seated conviction that germ theory constituted a mandate for taking immediate action to save lives. Biggs saw it as only reasonable that the individual autonomy of physicians and patients should begin yielding to the superior knowledge, resources, and coordination of state-funded institutions: a powerful idea grasping hold in all aspects of European as well as American society.⁹⁰ “The Government of the United States is democratic, but the sanitary measures adopted are sometimes autocratic,” Biggs remarked to members of the British Medical Association in 1897. “We are prepared, when necessary, to introduce and enforce . . . measures which might seem radical and arbitrary, if they were not plainly designed for the public good, and evidently beneficent in their effects.”⁹¹

This notion of the “public good” provided the strong moral imperative behind Biggs’s bold and innovative measures against infectious diseases. By the turn of the twentieth century, his efforts had transformed the New York City Department of Health into a model of national and international importance, providing inspiration to European cities and attracting the admiration of Robert Koch himself. “My dear Biggs,” Koch told him in 1908, “[while] most bacteriological and serological discoveries have come from Germany . . . we in Germany are years and years behind you in their practical application.

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You have done marvelous work!”⁹² Throughout his steady rise in power and prestige, Biggs’s fundamental personality remained unchanged. “We loved him for himself,” recalled a Columbia medical professor who had known Biggs for thirty years, citing “his quiet, modest manner, his freedom from all pretense and self-seeking, and his genuine quality of heart.”⁹³

The darker, more problematic side of Biggs’s legacy stemmed from his notion of “the public good” being universal and absolute. “Once [Biggs] made up his mind,” observed his biographer and former colleague, Charles-Edward Winslow, “he moved straight forward and did not desist until he had attained what he had set out to attain, fully and completely . . . [H]e knew he was right and he used the resources of the law wisely but fearlessly.”⁹⁴ In his quest to eliminate needless deaths, Biggs promoted increased public health oversight as the only reasonable solution; in this characterization, those who did not share his vision acted out of ignorance, error, or stubborn opposition to enlightenment and progress. His singlemindedness manifested repeatedly in his writings, speeches, policies, and fundamentally skewed research, all of which reinforced preconceived associations between pathology and place. By literally mapping disease onto buildings, Biggs reduced brick-and-mortar neighborhoods to two-dimensional symbols of dirt and disorder; by compressing the experiences of lower-class tuberculosis sufferers into uniform, impersonalized dots, he discouraged any further attempts to see and relate to them as individuals.⁹⁵ From the late 1890s onward, these dot clusters would assume their own forward momentum, providing housing reformers, settlement workers, and muckraking journalists with a powerfully effective focal point for their own determined crusades to improve society. In the process, they literally blotted out one working-class neighborhood’s ability to forge its own collective identity forever. Years after Biggs had died, his legendary status assured, New Yorkers continued to regard the area bounded by Cherry, Catherine, Hamilton and Market Streets as “a black blotch on the tuberculosis map.”⁹⁶