

Of Poets, Paupers and Planes: Tuberculosis and the City

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Abstract

Tuberculosis has afflicted human populations for thousands of years, but it was not until the nineteenth century that it came to be perceived as an epidemic that posed a serious public health problem. The dramatic rise in the incidence and the salience of tuberculosis, or “consumption,” coincided with the Industrial Revolution and the massive migration of populations to urban areas in Europe and the United States. In bringing unprecedented numbers of people together, industrial cities physically facilitated the spread of infectious diseases like tuberculosis. The transitions to city life and a capitalist industrial economy had great impact on culture and society, and these changes provided new ways of perceiving the intersections of health, illness, and class. Anxieties about the urban industrial lifestyle and the fate of the ever-changing city played out in perceptions of tuberculosis and its causes and possible treatments. Concerns about status and the growing underclass of laborers affected perceptions of consumptive patients and one’s own vulnerabilities to tuberculosis. Within the nineteenth century in Europe and the United States, tuberculosis evolved from being a romanticized disease of bohemian artists and musicians to being a social disease of the poor living in urban slums. In the beginning of the twentieth century, racial tensions in the United States fueled theories about tuberculosis and deviance in the African-American and immigrant populations. By the mid-twentieth century, tuberculosis began to fade from the people’s consciousness, and it was eventually deemed to be “eradicated” in the Western world thanks to advances in antibiotic therapy. In the past twenty years, however, tuberculosis has “returned,” in virulent, multi-drug resistant forms. The HIV/AIDS epidemic has played a role in this comeback, as weakened immune systems are unable to ward off tubercle bacillae. Perceptions of tuberculosis are very different in the current global era and reflect the anxieties about globalization today.

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Dedicated to everybody sick with tuberculosis today.

May they receive the treatment and care that they need and deserve.

Introduction

The historical and continuing shift of the population to urban areas has profoundly affected almost every aspect of human life. Political, economic, social, and cultural structures and institutions have evolved to accommodate urban life, and these structures shape people's daily lives on many different levels. The study and analysis of cities has illuminated various ways in which people interact with the urban environment. For example, structuralist theories of urban political power, relying heavily on Marxist theory, have stressed the importance of underlying economic and class relationships on life in the city.¹ Feminist examinations of the city have used gender as a lens to critique various aspects of urban life.²

I propose to use tuberculosis as a lens through which to view the urban environment and its accompanying political, economic, social, and cultural structures. Using a historical approach, I will outline the changing character of tuberculosis over the past two centuries, tracing the evolving beliefs about its etiology and strategies for its treatment. By looking through the lens of tuberculosis, I hope to demonstrate ways in which anxieties about urban life have changed through time but continue to affect how people think about the threats of the city, particularly disease.

Narratives about disease and illness have profound effects on the lives of individuals and the life of the city itself. By examining the history of tuberculosis narratives, I hope to come to a conclusion about the state of tuberculosis today. Theories and beliefs about tuberculosis have changed radically throughout the course of urban

¹ LeGates, Richard. "How to Study Cities." *The City Reader 3rd Edition*. Ed. Richard T. LeGates & Frederic Stout. New York: Routledge, 2003. 15.

² LeGates "How to Study Cities" 17.

history, and through a series of paradigm shifts, new ideas have replaced old ones. Certainly, today's understanding of tuberculosis within the biomedical realm is far superior to that of two centuries ago. However, the present focus on biomedical etiology and treatments has had the unfortunate effect of overshadowing the many astute sociological observations made throughout history about the prevalence of tuberculosis. By exploring the identity of tuberculosis across time, I wish to piece together a more holistic perspective of tuberculosis today and suggest how this perspective can be used to provide better methods for its prevention and treatment. In light of the successes and failures of past and present strategies, I suggest that tuberculosis prevention and treatment focus on structural issues and the conditions of the city in addition to providing individual care.

The complex interplay of bacterial behavior, susceptibility, and immune system response causes individuals to react very differently to the tubercle bacillus. The development of active pulmonary tuberculosis only occurs after a long and complicated series of events that are invisible to the human eye. An impressive array of environmental factors and individual vulnerabilities factor into the development of active disease, and our understanding of these variables has changed throughout history. The complex nature of tuberculosis infection, in addition to its deadly nature, make it the ideal topic for debate about the connections between illness, individual deviance, and environmental decay. Debates about the cause(s) of tuberculosis have raged since its incidence began to rise dramatically in the seventeenth century. Because the most recent tuberculosis epidemic was "coeval with the emergence of the modern world,"

tuberculosis is an affliction that is “often identified with the complexity and stress of modern living.”³

The conditions of the industrial city, along with the deviant groups that it produced, were often cited as aggravators of the dread disease. Although we understand the bacterial etiology of tuberculosis today, social and individual factors still influence the behavior of *Mycobacterium tuberculosis*. For example, the factors listed in the discussion of the rapid increase of tuberculosis rates beginning in the 1980s and continuing today are all characteristic of our time: “HIV and AIDS...inner-city deprivation, immigration and refugee status, failure (or dismantling) of the health services, and loss of diagnostic awareness and skill on the part of clinicians because of their lack of experience with TB.”⁴

The Etiology of Tuberculosis

The current understanding of tuberculosis revolves around the behavior of *Mycobacterium tuberculosis*, or the tubercle bacillus, and infectious disease theory. In humans, *Mycobacteria* are most commonly transmitted through inhalation of droplets coughed or sneezed out by an infected person, but tuberculosis can also spread through other forms of contact, such as ingestion of meat or milk from a contaminated cow.

When *M. tuberculosis* is inhaled, only very small particles manage to pass through the nasal passages and the upper respiratory tract without being destroyed. The bacteria that reach the alveoli, minute air sacs in the lung, are then engulfed by the white

³ Caldwell, Mark. *The Last Crusade: The War on Consumption 1862-1954*. New York: Atheneum, 1988. 9.

⁴ Caldwell *The Last Crusade* 17.

blood cells of the immune system. White blood cells normally destroy foreign bacteria, but *M. tuberculosis* has the ability to disrupt the process by which white blood cells “digest” what they eat, and so it is merely taken into the white blood cell but not killed. Inside the white blood cell, the tubercle bacillus is camouflaged and protected from the body’s defenses, and it proceeds to “multiply unmolested within the white blood cell.”⁵ Hence, although tuberculosis is best known as a lung disease, it is actually “fundamentally a disease of the blood”⁶ because it infects the body’s white blood cells.

Exposure to *M. tuberculosis* does not necessarily result in infection or progression of the disease, as there are both harmless and virulent strains of the bacillus and individuals have the ability to fight off the onset of disease. In some cases, a person will never develop an active case of tuberculosis, despite being exposed and infected. Thus, although “tuberculosis is a highly contagious disease - it remains to this day the world’s most serious bacteria-borne illness – [it is] also one that the majority of its potential victims can effectively resist.”⁷ Where the exposed individual does become infected, a case of “primary tuberculosis” develops within five years of primary infection, while “secondary tuberculosis” is diagnosed more than five years after primary infection.⁸

Mycobacterium tuberculosis reproduces very slowly compared to most bacteria, but after a period of unrestrained growth, the immune system eventually recognizes the harmful nature the bacillus contained within the white blood cells and attempts to contain the infection by creating lesions (sometimes called “tubercles.”) These tubercles are

⁵ Caldwell *The Last Crusade* 6-7.

⁶ Caldwell *The Last Crusade* 7.

⁷ Caldwell *The Last Crusade* 6.

⁸ Roberts, Charlotte A. & Jane E. Buikstra. *The Bioarchaeology of Tuberculosis: A Global View on a Reemerging Disease*. Gainesville: University Press of Florida, 2003. 5-6.

“small pockets with walls made of several kinds of blood cells, surrounding the bacilli.”⁹

Tubercles can often (85 to 90 percent of the time¹⁰) stave off disease, but a weakened immune system or a second exposure to *M. tuberculosis* (“reinfection”) can aggravate a latent infection by breaking down the lesions and releasing long-dormant bacilli, reactivating infection and leading to the development of active pulmonary tuberculosis.¹¹ The active form of the disease is said to begin when tubercles “break out of the alveoli and empty into the bronchi, the branching air passages that penetrate the lung, whence infection can be exhaled or spat into the air and spread to others.”¹²

Pulmonary tuberculosis is the most common and best known form of *M. tuberculosis* infection, because the tubercle bacillus requires oxygen to survive and grows best in dark, moist places.¹³ Other forms of tuberculosis include scrofula (tuberculosis of the lymph glands), *lupus vulgaris* (tubercular lesions of the skin), and miliary tuberculosis, in which the tubercle bacillus spreads throughout the body in the bloodstream or lymphatic system and creates “tiny seedlike pods of infection.”¹⁴ Symptoms of active pulmonary tuberculosis include cough, bloody sputum, hemorrhages within the lungs, daily fever that rises in the afternoon and falls at night, drenching night sweats, weight loss, fatigue, heart palpitations, and chest pain.¹⁵ Eventually, the lungs are consumed by the bacteria, resulting in death.

⁹ Roberts & Buikstra *Bioarchaeology of TB* 7.

¹⁰ Roberts & Buikstra *Bioarchaeology of TB* 7.

¹¹ Roberts & Buikstra *Bioarchaeology of TB* 19.

¹² Caldwell *The Last Crusade* 8.

¹³ Caldwell *The Last Crusade* 5.

¹⁴ Caldwell *The Last Crusade* 9.

¹⁵ Caldwell *The Last Crusade* 8.

Tuberculosis poses a complex health threat because, although it is a highly infectious disease, infection does not always lead to the development of active disease. Its contagious nature is masked by the fact that people's immune systems can fight off the bacteria. The ability of one's immune system to contain the tubercle bacillus depends on one's overall health, nutritional status, age, and living conditions. Taking these factors into account, it is not surprising that throughout history, many different variables have been cited as causes of tuberculosis. Today, myriad factors are recognized as influencing the occurrence of infection, and the epidemiology of tuberculosis "is a complex mix of many variables: the young, the old, and the malnourished are susceptible; poor environmental living conditions, high population density, certain occupations, the co-occurrence of HIV, and the lack, or crumbling of, public health infrastructures in some countries."¹⁶ The complex nature of tuberculosis exposure, infection, and disease lead to difficulty in controlling and treating it, but they are also what makes tuberculosis "so thought-provoking and fascinating" and "what has attracted authors' and artists' attention throughout history."¹⁷ Historical interest in the disease and the constant interaction of tuberculosis with its environment makes it a useful barometer of social change and the urban climate.

The Evolution of Tuberculosis and the City

Bio-archaeological evidence suggests that tuberculosis has affected humans and animals for thousands of years. Evidence of tuberculosis infection has been found in Egyptian mummies, and "the earliest suggested evidence for tuberculosis dates from a

¹⁶ Roberts & Buikstra *Bioarchaeology of TB* 11.

¹⁷ Roberts & Buikstra *Bioarchaeology of TB* 11.

Neolithic grave near Heidelberg, dated at 5,000 BC, where the skeleton of a young man showed destruction of two vertebrae from the thoracic spine.”¹⁸ Prehistoric evidence of tuberculosis infection has led authorities to speculate that “the epidemic form of tuberculosis really began in the first cities of the ancient world.”¹⁹ Historically, tuberculosis epidemics have been peculiarly urban, and in the burgeoning industrial cities of the late eighteenth and early nineteenth centuries tuberculosis was a serious public health threat. As I will discuss in more detail later, there is no doubt that early industrial cities provided optimal conditions for the spread of infectious disease, but it was not only the physical environment that augmented the tuberculosis epidemic. The social and cultural conditions of urban industrial life provided a context in which tuberculosis, or “consumption,” could thrive. Above all other diseases, tuberculosis became a metaphor for life (and death) in the modern industrial city.²⁰ This metaphor has changed and evolved, but it has remained salient for an impressive amount of time.

Diseases are constantly evolving, both literally and ideologically. Bacteria multiply extremely rapidly and thus have the capability to adapt to changing situations relatively quickly. Since the introduction of antibiotics in the early twentieth-century, bacteria have managed to develop resistance faster and faster. Tuberculosis is no exception. The existence of multi-drug resistant strains of TB is now considered to be a serious threat to global public health. The evolution of tuberculosis, however, occurs at more than just the microbial level. Perceptions and definitions of tuberculosis as an

¹⁸ Ryan, Frank. *The Forgotten Plague: How the Battle Against Tuberculosis Was Won – and Lost*. Boston: Little, Brown & Company, 1992. 5.

¹⁹ Ryan *The Forgotten Plague* 5.

²⁰ Sontag, Susan. *Illness As Metaphor*. New York: Farrar, Straus and Giroux, 1977.

illness, theories about its cause, methods of treatment, who becomes infected, who becomes symptomatic, the way tuberculosis is experienced by those who are ill, and even the names by which tuberculosis is called have all changed over time. The nature of these changes has often reflected their historical context, and as a result tuberculosis provides a window through which to view the evolution of urban life.

The evolution of cities has been accompanied by epidemics of all kinds, and “a chief obstacle to the growth of cities in the past has been their excessive mortality.”²¹ Epidemiologists and historians have observed that epidemics occur most often during times of social, political, and/or economic change and unrest, noting that “every major change in society, population, use of the land, climate, nutrition or migration is also a public health event with its own pattern of diseases.”²² The industrial revolution and the accompanying phenomenon of urbanization brought on a period of great change which affected the lives of humans and bacteria alike. Even though tuberculosis was a prehistoric disease, there is evidence that it has preferentially afflicted urban populations since the existence of the first cities. The signs and symptoms of tuberculosis are “described frequently and at length by Hindu, Greek, and Roman writers, who lived in urban societies, but they are barely mentioned in the Bible and in other lore of pastoral peoples.”²³

In addition to changes brought on by the evolution of cities, there may have been other, more systemic, changes occurring to tuberculosis. The history of disease is often

²¹ Davis, Kingsley. “The Urbanization of the Human Population.” *Scientific American* September, 1965. from *The City Reader 3rd Edition*. Ed. Richard T. LeGates & Frederic Stout. New York: Routledge, 2003. 29.

²² Gandy, Matthew & Alimuddin Zumla. *The Return of the White Plague: Global Poverty and the ‘New’ Tuberculosis*. New York: Verso, 2003. 3.

²³ Dubos, Rene & Jean Dubos. *The White Plague*. New Jersey: Rutgers, 1952. 6.

seen as a linear process, but current theory focuses on the idea of epidemic curves or cycles, reflecting the patterns of contagion through various populations. Within a cycle, a disease's prevalence rises rapidly, plateaus, and then subsides gradually. Mark Caldwell argues that tuberculosis follows this pattern, but "its cycles are apparently unusually slow, not spanning months or decades but centuries."²⁴ Gandy and Zumla observe that in the most recent epidemic cycle, tuberculosis "began to increase again around 1730, and reached a maximum in England and America at the end of the eighteenth and during the first half of the nineteenth century."²⁵ Caldwell agrees, stating that "at present we are living at the apparent end of a long epidemic wave, which appears to have begun in Europe in the late seventeenth century, just as the industrial revolution commenced, as towns began to turn from overgrown villages into sprawling metropolises, as science came of age and the pace of its discoveries began to accelerate."²⁶ Whether or not the epidemic cycle theory applies to tuberculosis is yet to be seen, especially because although the epidemic may have peaked in the Western World, tuberculosis still plagues many parts of the so-called developing world.

At its peak in the mid-nineteenth century, tuberculosis was "unquestionably the greatest single cause of disease and death in the Western world," and it was found "masquerading throughout medical and nonmedical writings under a bewildering variety of names" including phthisis (the ancient Greek word), consumption, scrofula, asthenia, tabes, bronchitis, inflammation of the lungs, hectic fever, gastric fever, and lupus.²⁷ A common saying during the nineteenth century was "everyone is sometime or another a

²⁴ Caldwell *The Last Crusade* 9.

²⁵ Dubos & Dubos *The White Plague* 8.

²⁶ Caldwell *The Last Crusade* 9.

²⁷ Dubos & Dubos *The White Plague* 10.

little bit consumptive,”²⁸ which at times was just “an indirect way of saying you were tired and wished to be alone, or that you felt artistic, sensual, and vaguely dramatic,” but it was also true in a more literal sense. Scholars of tuberculosis argue that “it is certain that during the eighteenth and nineteenth centuries all dwellers in large cities of Europe became infected at an early age and remained in contact with heavily contaminated objects, sputum, food and dust throughout their life.”²⁹ This argument is supported a series of surveys made at the beginning of the twentieth century that “revealed that almost all members of the adult population in European and American cities were tuberculin positive and, therefore, had been at some time infected with tubercle bacilli. Examination with X-rays added to the significance of this finding by showing evidence of active tuberculous lesions in many individuals who were thought to be normal and healthy.”³⁰

Tuberculosis Metaphors

In *Illness As Metaphor*, Susan Sontag notes that “like all really successful metaphors, the metaphor of TB was rich enough to provide for two contradictory applications.”³¹ In addition, the complexity of the disease encouraged a range of other conflicting images. Tuberculosis was a “disease of passion” afflicting the “reckless and sensual,”³² and yet it was also a “disease of poverty and deprivation – of thin garments,

²⁸ Ott, Katherine. *Fevered Lives: Tuberculosis in American Culture since 1870*. Cambridge: Harvard University Press, 1996. 1.

²⁹ Dubos & Dubos *The White Plague* 96.

³⁰ Dubos & Dubos *The White Plague* 122.

³¹ Sontag *Illness as Metaphor* 25.

³² Sontag *Illness as Metaphor* 21.

thin bodies, unheated rooms, poor hygiene, inadequate food.”³³ The tuberculosis patient was consumed and burned up by a disease of extreme contrasts: cheeks fluctuating between white pallor and red flush, the patient fluctuating between hyperactivity and languidness. The symptoms of tuberculosis were highly visible – emaciation, coughing, fever – but the destruction of the lungs was hidden within the body. Tuberculosis was deceptive – it brought on spells of euphoria, increased appetite, and sexual desire – yet the healthy-looking rosy cheeks were actually brought on by deathly fever.³⁴

In order to explore the shifting metaphors associated with tuberculosis and the city, I will focus on three informal, overlapping time periods: (1) the period beginning in the late eighteenth century with the advent of the Industrial Revolution and ending in the middle of the nineteenth century (what I will call the Romantic Period), (2) 1850-1930 (during which the tubercule bacillus was discovered and tuberculosis was considered a social disease), which I will call the Industrial Period and (3) 1980-2000 (the era of globalization in which drug-resistant forms of tuberculosis have made a comeback), which I will call the Global Period. Each of these periods uses a unique set of images and vocabulary to talk about tuberculosis.

Many of the metaphors described by Susan Sontag were applicable during the Romantic Period, when tuberculosis was “celebrated as the disease of born victims, of sensitive, passive people who are not quite life-loving enough to survive,”³⁵ and consumption was viewed “as a habit, a disposition (if not an affectation), a weakness that

³³ Sontag *Illness as Metaphor* 15.

³⁴ Sontag *Illness as Metaphor* 13.

³⁵ Sontag *Illness as Metaphor* 25.

must be strengthened and to which city people are more disposed.”³⁶ However, “as the number of deaths mounted throughout the first half of the [nineteenth] century, it became obvious that the gravity of [tuberculosis] could no longer be concealed under genteel but misleading expressions...tuberculosis was ‘The Great White Plague,’ threatening the very survival of the European race.”³⁷ Tuberculosis came to be seen as a social disease that afflicted the poor masses living in squalor in urban industrial slums, and the “crusade” against TB included massive social reforms and improvements in public health and hygiene. Improvements in living conditions, coupled with the discovery of streptomycin and isoniazid (antibiotics which were very effective in treating TB), effectively “eradicated” tuberculosis in Western Europe and the United States by the mid-twentieth century. At this point, tuberculosis appeared to lose its salience as a metaphor for urban life.

Recently, however, the United States has had to face the specter of tuberculosis once more. Global inequality has aggravated the tuberculosis epidemic, as poor standards of care in the developing world have given rise to antibiotic resistant strains of tuberculosis. So-called MDR-TB (multi-drug resistant TB) and XDR-TB (extensively drug-resistant TB) strains are extremely difficult and expensive to treat, and the frequency and ease of global air travel means that such strains pose a threat to the entire world. Now that tuberculosis poses a renewed threat to the United States, old fears are coming back. Sharon Zukin argues that “one of the most tangible threats to public

³⁶ Sontag *Illness as Metaphor* 27.

³⁷ Dubos & Dubos *The White Plague* 10.

culture comes from the politics of everyday fear,”³⁸ and the fear of infection by foreign strains of MDR- and XDR-TB is especially salient in today’s Global Era. Current treatment is almost entirely biomedically focused, and the largely successful social reforms of the Industrial Period have been abandoned for medical research and the development of new antibiotics. In the following sections, I will further explore the three periods that I have just summarized and then attempt to draw some conclusions about the state of tuberculosis and the city today and make some suggestions for the future.

³⁸ Zukin, Sharon. “Whose Culture? Whose City?” 1995. from *The City Reader 3rd Edition*. Ed. Richard T. LeGates & Frederic Stout. New York: Routledge, 2003. 144.

Consumption In The Romantic Period

The Romantic period has never been easy to define, and scholars of Romanticism have debated its characteristics to the point at which Morse Peckham asked “can we hope for a theory of romanticism?”³⁹ That said, many agree that Romanticism was “a specific historical movement in art and ideas which occurred in Europe and America in the late eighteenth and early nineteenth centuries,”⁴⁰ coinciding with the beginnings of the Industrial Revolution and the rising prevalence of tuberculosis. Most analyses of Romanticism center around literature, art, music, poetry, and architecture, yet philosophy and politics were also influenced by the Romantic movement. Although the literature is lacking in specific analyses of the Romantic city, the works of contemporary artists and writers paint a vivid picture of Romantic conceptions of urbanity. Rene Wellek’s classic modern definition of Romanticism cites “imagination for the view of poetry, nature for the view of the world, and symbol and myth for poetic style.”⁴¹ Two exemplars of the Romantic movement, William Wordsworth and Henry David Thoreau celebrated the awesome beauty of nature in strongly emotional and symbolic terms. This Romantic veneration of nature characterized the city as unnatural and unhealthy.

³⁹ Peckham, Morse. “Toward a Theory of Romanticism.” *PMLA*, Vo. 66, No. 2. March, 1951. 5.

⁴⁰ Peckham “Theory of Romanticism” 5.

⁴¹ McGann, Jerome. “Rethinking Romanticism.” *ELH*, Vol. 59, No. 3. Autumn, 1992. 735

Both Wordsworth and Thoreau were also preoccupied with death: Thoreau, who died of tuberculosis at the age of 45, once wrote that “decay and disease are often beautiful, like...the hectic glow of consumption.”⁴² In addition, “the central experience which Wordsworth describes [in his work] is spiritual death and rebirth.”⁴³ Illness and death, especially from tuberculosis, were oft the topics of Romantic literature, poetry, and art, and many prominent Romantic figures lost their lives to consumption. Aside from Thoreau, these writers John Keats, Lord George Gordon Byron, Anne and Emily Bronte, Ralph Waldo Emerson, and Jean-Jacques Rousseau, and composer Frédéric Chopin. Romantic ideas about death and disease, industrialization, and urbanization all influenced the identity of tuberculosis in the late eighteenth and early nineteenth centuries.

Tuberculosis was best known as “consumption” to Romantics, and the name fits contemporary beliefs about the illness well. The word consumption stems from the Latin *con* (“completely”) and *sumere* (“to take up from under”); thus as the body is consumed by the disease the soul is also “taken up” or elevated to a higher consciousness.⁴⁴ In the Romantic period, “consumption was a disease not just of body, but also of mind and spirit.”⁴⁵ Romantic descriptions of tuberculosis emphasize the ethereal and delicate nature of the disease and its victims, largely ignoring its painful and gory symptoms. The illness and death of Henry David Thoreau provide a good example of how “the myth of disease could overshadow reality:” a contemporary obituary described his passing as “tranquil...an euthanasia befitting such an exalted spirit.”⁴⁶ Consumption was

⁴² Dubos & Dubos *The White Plague* 46.

⁴³ Peckham “Theory of Romanticism” 16.

⁴⁴ Caldwell *The Last Crusade* 21.

⁴⁵ Ott *Fevered Lives* 1.

⁴⁶ Caldwell *The Last Crusade* 18.

considered to lead to “a gentle death, the soft peril of those who scorned attachment to the solidity of matter...it was a badge of refinement.”⁴⁷ In a time when tuberculosis “carried off more Americans than any other disease,” the illness “meant a slow and a certain, but also a dignified, even a radiant death...among illnesses, tuberculosis was seen as the most spiritual, the most ennobling, a purger of base qualities and a distiller of lofty ones.”⁴⁸

Tuberculosis afflicted the entire population, but “the disease struck hardest among young men and women in their prime, condemning many of them to early death.”⁴⁹ The prevalence of the disease “distorted the norms of life and behavior for several generations by killing young adults,” and Dubos and Dubos suggest that this “contributed to the atmosphere of gloom that made possible the success of the ‘graveyard school’ of poetry and the development of the romantic mood...instead of singing of the healthy joys of love, poets cultivated the refined sadness evoked by the thought that the beloved might soon depart.”⁵⁰ Indeed, the specter of consumption shows itself in the poetry, literature, theater, and opera of the time. The tragic heroines of Victor Hugo’s *Les Misérables* and Giuseppe Verdi’s *La Traviata* succumb to consumption. The paintings of Edvard Munch and Amadeo Modigliani feature pale, thin, consumptive figures.

The popular opinion of tuberculosis is illustrated in its common use as a plot device, a “natural manner to dispose of a character and facilitate the plot...[and] a device to enlist the sympathies of the reader.”⁵¹ Because consumption was “believed to affect

⁴⁷ Caldwell *The Last Crusade* 20.

⁴⁸ Caldwell *The Last Crusade* 16-17.

⁴⁹ Dubos & Dubos *The White Plague* 10.

⁵⁰ Dubos & Dubos *The White Plague* 44-45.

⁵¹ Dubos & Dubos *The White Plague* 47.

chiefly sensitive natures,” it conferred upon characters “a refined physical charm before making them succumb to a painless, poetical death.”⁵² Consumptive heroines were often rendered more attractive, their souls purified “through suffering and resignation.”⁵³ The Romantic ideal of feminine beauty of “the fragile silhouette, with long limbs, long fingers, long throat, the tired head leaning on a pillow, with prominent eyes and twisted sensual mouth, became the unhealthy, perverted symbol of Romanticism.”⁵⁴ The Pre-Raphaelites, a group of painters who objected to industrialization, were partial to elongated portraits of “women with cadaverous bodies and sensual mouths.”⁵⁵ On rare occasions, ideals of feminine beauty directly impacted women’s health: in order to achieve the pale, thin, consumptive image, some young women drank “lemon juice and vinegar to kill their appetites” and “swallowed sand in order to ruin their stomach linings and acquire a pallid complexion.”⁵⁶

Beliefs about the cause and appropriate treatment for tuberculosis were intertwined with the image of the young consumptive artist/poet and often belied contemporary anxieties about urban life. Consumption was not believed to be contagious, but rather brought on by a complex mixture of constitutional qualities (the individual’s physical, mental, and spiritual state), heredity, and environmental variables (including climactic and rural/urban factors.) The poet John Keats, whom Dubos and Dubos choose to exemplify “the tragedy of consumption, the perverted attitude of the romantic era toward the disease, and the ignorance of nineteenth century medicine

⁵² Dubos & Dubos *The White Plague* 48.

⁵³ Dubos & Dubos *The White Plague* 48.

⁵⁴ Dubos & Dubos *The White Plague* 57.

⁵⁵ Dubos & Dubos *The White Plague* 56.

⁵⁶ Dormandy, Thomas. *The White Death*. New York: New York University, 2000. 91.

concerning its diagnosis, nature and treatment,”⁵⁷ died of tuberculosis in 1821 at the age of twenty-six. The circumstances of his illness and premature death were fashioned into a romanticized portrait of “the fragile poet who fell victim to tuberculosis because his sensitive nature had been unable to withstand contact with a crude world.”⁵⁸

The “crude world” that was the downfall of Keats and other “fragile” individuals was the rapidly growing and changing metropolis created by the Industrial Revolution. Fast-paced city life proved to be too much for the delicate constitutions and melancholy spirits of Romantic bohemians. French physician and scientist René-Théophile-Hyacinthe Laennec, the inventor of the stethoscope and “one of the most revered figures in the history of French medicine,”⁵⁹ argued fervently in 1826 that *passions tristes* (sorrowful passions) were one of the main causes of tuberculosis. He used this theory to explain the prevalence of tuberculosis in urban areas compared to rural ones, stating that in large cities, “men have more relations with each other, and so have cause for more frequent and profound sorrows; bad morals and poor conduct of all sorts are more common there and are often the cause of bitter regrets that cannot be consoled and that even time cannot soften.”⁶⁰ In Laennec’s view, the lack of social relationships and the resulting loneliness and anomie could incite *passions tristes* and lead to the development of illness.

Many aspects of city life that were deeply disturbing to the morally upright citizens of the late eighteenth and early nineteenth centuries were cited as causes of

⁵⁷ Dubos & Dubos *The White Plague* 11.

⁵⁸ Dubos & Dubos *The White Plague* 11.

⁵⁹ Barnes, David S. *The Making of a Social Disease*. Berkeley: University of California Press, 1995. 25.

⁶⁰ Barnes *Social Disease* 29.

consumption. The extremely high prevalence of tuberculosis meant that “during the eighteenth and nineteenth centuries all dwellers in large cities...became infected at an early age...however, infection does not necessarily mean disease, and phthisis became apparent chiefly in those afflicted with great natural susceptibility to it.”⁶¹ Consumption was an ever-present threat; “few diseases shaped the contours of American life more dramatically than tuberculosis, which claimed between a seventh and a quarter of all who died during the first half of the nineteenth century.”⁶² Because tuberculosis was a ubiquitous and yet mysterious disease at the time, speculations about its etiology were extremely common and varied (and often contradictory.) In this sense, tuberculosis in the Romantic era was much like cancer today; those suspicious of modern technology are quick to cite televisions or cell phones as causes of cancer.⁶³

In the Romantic period, the “artificialities of city life”⁶⁴ so disturbed people that “each and every vice, large or small – in fact almost any form of unconventional behavior – was regarded as a cause of consumption.”⁶⁵ As cities began to house a larger and larger proportion of the industrializing world’s population, the habits of the urban elite were scrutinized. “Immoderate love of food, spirits, or social life” and “a passion for dancing”⁶⁶ were considered dangerous to one’s health. “Newfangled fashions,”⁶⁷ especially garments that constricted women’s waists and exposed their chests, were believed to cause tuberculosis.

⁶¹ Dubos & Dubos *The White Plague* 96.

⁶² Feldberg, Georgina D. *Disease and Class*. New Jersey: Rutgers, 1995. 11.

⁶³ See Susan Sontag’s *Illness as Metaphor* for more on parallels between tuberculosis and cancer.

⁶⁴ Dubos & Dubos *The White Plague* 198.

⁶⁵ Dubos & Dubos *The White Plague* 197.

⁶⁶ Dubos & Dubos *The White Plague* 197.

⁶⁷ Dubos & Dubos *The White Plague* 197.

In addition to the vices existing in the city itself, man's separation from the wilderness, his "natural" environment, was also considered unhealthy. Many believed the transition from a rural, agrarian lifestyle to an industrial, urban one to be a grave threat to the health of the population. The sedentary, indoor lifestyle of the urban dweller, especially that of the artist or writer, weakened the constitution and rendered one prone to consumption. Urban living and working quarters were often cramped and poorly-ventilated and perceived to be inimical to good physical and mental health.

Just as the city was considered to be immoral and unhealthy, the country was seen as pure and therapeutic, and this perception drove most of the theories of how tuberculosis was best treated. The Romantic era's "reification of nature provided a compelling and uniting therapeutic stratagem."⁶⁸ The most popular treatment for consumption was to escape the city, retreat to the peace of nature, and reap the benefits of fresh air, sunlight, and moderate exercise. Beliefs about the effect of climate influenced this health seeking behavior. Consumptives sought out warm, dry climates, considering them beneficial to their ailing lungs. Many tubercular Europeans journeyed to Mediterranean shores; Keats and his contemporary Shelley "symbolize the romantic and consumptive youths of the nineteenth century, fleeing from melancholy skies and cold damp gloom. They were part of a great pilgrimage, begun long before, leading the sick from the Northern fog toward the Southern sun – the shrine of health, joy and illusion."⁶⁹ Meanwhile, American health seekers searched for cures in southern states such as Florida

⁶⁸ Feldberg *Disease and Class* 16.

⁶⁹ Dubos & Dubos *The White Plague* 19.

and on the “southwestern plateau, in the mountains and deserts of Colorado, New Mexico, Arizona, and California.”⁷⁰

Only the relatively well-off could afford to stop working, travel, and spend significantly long periods of time as invalids. Those who had the means, however, were “obliged to seek cures and...had a lifelong obligation to improve;” in turn invalids “were permitted, even expected, to modify social obligations in order to fulfill this special task.”⁷¹ Being an invalid required one to strive to get better, but it also allowed one to abandon certain stresses and duties, and “for many Northerners, the South also meant escape from worries and responsibilities.”⁷² Shelley, for example, moved to Italy in 1818, “partly to escape the cold but also running away from a troubled life.”⁷³ American health seekers took up the roles of pioneer and explorer, as “popular fantasies joined with medical precepts to attribute to the West therapeutic powers. The region exerted its hold on the imagination not only in dreams of personal wealth (finding gold) but also in desires for physical renewal (finding health).”⁷⁴ Emily K. Abel’s book *Suffering in the Land of Sunshine* chronicles the experiences of nineteenth-century American consumptives who flocked to California in order to benefit from the sunlight and the hot, dry air.⁷⁵

Philadelphia native Lawrence F. Flick was one such westward-traveling American health seeker, and his experiences in New Mexico and California deeply influenced his

⁷⁰ Rothman, Sheila M. *Living in the Shadow of Death*. New York: BasicBooks, 1994. 5.

⁷¹ Rothman *Shadow of Death* 4.

⁷² Dubos & Dubos *The White Plague* 26.

⁷³ Dubos & Dubos *The White Plague* 18-19.

⁷⁴ Rothman *Shadow of Death* 5.

⁷⁵ Abel, Emily K. *Suffering in the Land of Sunshine: A Los Angeles Illness Narrative*. New Jersey: Rutgers University Press, 2006.

later work with consumptive Philadelphians, which I will review later. Flick graduated from Jefferson College in 1879, having spent most of his time at medical school very frail and consumptive.⁷⁶ After graduation he was diagnosed with tuberculosis and sent West for his health. Dr. Flick traveled first to New Mexico and then to California, where he worked in an orange grove in Los Angeles. There, he found that the “low paid job without worry or responsibility had brought such changes in his health that he saw in it his first chance of recovery.”⁷⁷ Dr. Flick returned to Philadelphia in 1883, a time when beliefs about the nature and cause of consumption were changing dramatically, and he became a major player in the battle waged against tuberculosis at the turn of the century.

⁷⁶ Flick, Ella M. E. *Dr. Lawrence F. Flick 1856:1938*. Philadelphia: White Haven Sanatorium Association, 1940. 8.

⁷⁷ Flick *Lawrence Flick* 17.

The Industrial Period: Tuberculosis as a Social Disease

At the beginning of the nineteenth century, industrialization and urbanization continued rapidly apace and cities became more and more overcrowded, polluted, and unsanitary. At this time, tuberculosis was the leading cause of death in industrial cities.⁷⁸ Urbanization drastically changed the social environments that people lived in; as urban scholar Kingsley Davis writes, “the large and dense agglomerations comprising the urban population involve a degree of human contact and of social complexity never before known.”⁷⁹ These changes occurred relatively quickly; in 1965, Davis argued that “before 1850 no society could be described as predominantly urbanized, and by 1900 only one – Great Britain – could be so regarded. Today all industrial nations are highly urbanized.”⁸⁰ Thus in within less than century the United States evolved from an agrarian nation to an urban one. The rapidity of this change was a shock to the political, economic, social, and physical structures of a country that was still relatively young.

⁷⁸ Roberts & Buikstra *Bioarchaeology of TB* 16.

⁷⁹ Davis “Urbanization” 27.

⁸⁰ Davis “Urbanization” 27.

Industrial cities were plagued by “excessive mortality,”⁸¹ and infectious diseases ran rampant due in part to poor sanitation, poverty, and overcrowded and polluted living and working conditions. Statistics in the United States from the nineteenth century showed that “as [the U.S.] became urbanized, TB morbidity increased...the more crowded the cities, the higher the death rate from consumption.”⁸² The death rate from tuberculosis in major American cities, including New York, Philadelphia, and Boston, rose dramatically after 1850.

The galloping growth of the industrial city, the squalor of some of its neighborhoods, and high levels of mortality deeply disturbed many scholars, artists, and leaders of the time. Frederic Stout suggests that “for the cities of the Industrial Revolution, a number of forms of expression and modes of critical analysis arose to make sense of the dramatic and rapidly changing social reality.”⁸³ Stout uses the term “urban social realism”⁸⁴ to describe a style of nineteenth-century art, but it may be applied to styles of literature, scholarship, politics, research, and philanthropy that developed during that time as well. All of these forms of expression and analysis were used to make sense of the conditions of industrial city and the prevalence of tuberculosis as a major cause of suffering and death.

⁸¹ Davis “Urbanization” 29.

⁸² Engs, Ruth Clifford. *Clean Living Movements: American Cycles of Health Reform*. Westport: Praeger, 2000. 166.

⁸³ Stout, Frederic. “Visions of a New Reality: The City and the Emergence of Modern Visual Culture.” 1999. from *The City Reader 3rd Edition*. Ed. Richard T. LeGates & Frederic Stout. New York: Routledge, 2003. 147.

⁸⁴ Stout “Visions of a New Reality” 147.

The work of Friedrich Engels, in which he described the poor slums of industrial cities in graphic detail, provided “the basis for the social realist tradition in literature.”⁸⁵ Of the working-class neighborhoods of Manchester, Engels writes, “no cleanliness, no convenience, and consequently no comfortable family life is possible...in such dwellings only a physically degenerate race, robbed of all humanity, degraded, reduced morally and physically to bestiality, could feel comfortable and at home.”⁸⁶ Engels not only depicts the physical atrocities of the city, he also draws conclusions about the moral and social unraveling of the population: “the more these individuals are crowded together, within a limited space,” the more “the brutal indifference, the unfeeling isolation of each in his private interest becomes...repellent and offensive.”⁸⁷ People are reduced to “monads, of which each one has a separate principle and a separate purpose,”⁸⁸ and community and social stability are sacrificed in the name of individualism. In moving to urban areas, people are forced to “sacrifice the best qualities of their human nature.”⁸⁹

Lewis Mumford, an American scholar, also commented on the connection between the physical city and the state of society and humanity when he noted that “it is not for nothing that men have dwelt so often on the beauty or the ugliness of cities: these attributes qualify men’s social activities.”⁹⁰ Engels wrote about Manchester, and yet he

⁸⁵ LeGates, Richard T. & Frederic Stout. *The City Reader 3rd Edition*. New York: Routledge, 2003. 59.

⁸⁶ Engels, Friedrich. “The Great Towns.” *The Condition of the Working Class in England in 1844*. 1845. from *The City Reader 3rd Edition*. Ed. Richard T. LeGates & Frederic Stout. New York: Routledge, 2003. 66.

⁸⁷ Engels “The Great Towns” 60.

⁸⁸ Engels “The Great Towns” 60.

⁸⁹ Engels “The Great Towns” 59.

⁹⁰ Mumford, Lewis. “What is a City?” *Architectural Record*. 1937. from *The City Reader 3rd Edition*. Ed. Richard T. LeGates & Frederic Stout. New York: Routledge, 2003. 94.

argues that “what is true of London, is true of Manchester...is true of all great towns,”⁹¹ including those in the United States. Engels’ portrayal of the industrial city remained salient throughout the nineteenth century, and anxieties about urban life reflected the “physical decrepitude...alienation and despair”⁹² that he described.

In contrast to previous Romantic authors, “the writers of the realist school, who visited slums and hospitals that they might observe the sick and poor, acknowledged in dark words the bodies distorted by cough, the faces livid with asphyxiation, the minds haunted by the thought of death.”⁹³ The squalid conditions described by social critics like Engels and social realist writers such as Charles Dickens and Upton Sinclair played a part in the proliferation of disease and the high rates of morbidity and mortality in nineteenth century and early twentieth-century cities. City dwellers could no longer ignore the incredible killing power of consumption, and “in reaction against the artificialities of the Romantic Era...turning their eyes away from the languorous, fainting young women and their romantic lovers, they noticed instead the miserable humanity living in the dreary tenements born of the Industrial Revolution.”⁹⁴ Consumption became tuberculosis: a “contagion, something unclean,” and “a blot on society, the symbol of all that was rotten in the industrial world.”⁹⁵

Artists, journalists, and writers were not the only ones disturbed by the strikingly poor health of the industrial urban population. With such striking levels of death and disease surrounding them, doctors, sociologists, philanthropists and eventually the

⁹¹ Engels “The Great Towns” 60.

⁹² LeGates & Stout *City Reader* 59.

⁹³ Dubos & Dubos *The White Plague* 66.

⁹⁴ Dubos & Dubos *The White Plague* 65.

⁹⁵ Dubos & Dubos *The White Plague* 66.

government discerned the need to quantify morbidity and mortality. It was apparent that cities in general and certain populations within cities in particular suffered higher rates of illness and death, and scholars developed methods measure those rates in hopes of figuring out why. It was during this period that epidemiology matured and gained widespread use, and governments became increasingly involved in measuring and trying to protect the health of their people.

Many of the changes accompanying urbanization were similar across industrializing nations, and yet there existed a unique set of circumstances in the United States. The seeds of industrialization were planted as the Civil War raged, and emancipation roughly coincided with the birth of America's first true industrial cities. A huge population of newly freed slaves flooded the Northeast's burgeoning urban areas and augmented the industrial work force. This work force also contained a steadily growing population of (mostly European) immigrants, most of whom settled in cities. Thus racial and ethnic issues posed a much greater concern in American cities than those of Great Britain or Western Europe. During this time, tuberculosis affected populations worldwide. Industrial cities struggled with the specter of consumption in similar ways, yet there existed both subtle and dramatic local differences.

By the middle of the nineteenth century, tuberculosis had transformed from a romantic illness brought on by heredity, a weak constitution, or a sedentary lifestyle to a highly reviled disease of the urban poor and degenerate. Differences in susceptibility still varied between individuals, but the portrait of the consumptive had changed, and thus a new set of people were perceived as vulnerable to tuberculosis. "In the decades that bounded the Civil war, medical writings exposed apprehensions about professional status,

regional rivalries, and the growth of industrial cities, and they foreshadowed persistent American concerns with the social dimensions of disease.”⁹⁶ Prejudices about certain racial and ethnic groups were played out within the context of medicine and sanitary and social reform, and control of these populations was legitimated by public health concerns. In short, “confronted with tremendous clinical complexity and variation, [mid-nineteenth century American physicians] turned for explanation to gender, race, environment, and employment, and sought therapy and prevention in the transformation of behaviors.”⁹⁷

Tuberculosis often affected people in their prime working years, which in the context of industrial capitalism posed an unacceptable threat to production. In the context of the period’s preoccupation with social ills in the city, tuberculosis was cast as a social disease. Physicians, epidemiologists, and sociologists contested the causes of tuberculosis and preferred treatment and prevention methods, but in nineteenth and early-twentieth century America, the social aspect of tuberculosis was rarely disputed. Discussions of the distribution, cause, and treatment of tuberculosis during this time were invariably influenced by the social and intellectual climate in industrial American cities. Tuberculosis turned out to be such a fitting symbol of urban society’s problems that even when the bacterial cause of tuberculosis was discovered, the United States continued to focus on the disease’s social causes.

In 1865, as the American Civil War was drawing to a close, French physician J.-A. Villemin proved the contagiousness of tuberculosis in a series of elegant experiments.⁹⁸ Seventeen years later, in 1882, German physician Robert Koch identified

⁹⁶ Feldberg *Disease and Class* 12.

⁹⁷ Feldberg *Disease and Class* 36.

⁹⁸ Caldwell *The Last Crusade* 29.

the *tubercle bacillus* as the microbial cause of consumption. American physicians were initially resistant to these European discoveries. Many Philadelphia physicians, including H.F. Formad, Horatio Wood, and James Wilson, attempted to replicate Koch's experiments and failed to produce the same results.⁹⁹ H.F. Formad, a pathologist at the University of Pennsylvania, was initially open to Koch's postulates, but he eventually became "one of Koch's most vociferous American opponents."¹⁰⁰ Formad was an early advocate of bacteriology, and he accepted that "there is a poison in tuberculosis," but he argued that that poison (the *tubercle bacillus*) did not come from an outside source but was "generated by the body itself."¹⁰¹

Another Philadelphia physician, Dr. W.H. Webb, was also equivocal in his analysis of Koch's findings. Unlike Formad, Webb accepted the contagiousness of tuberculosis, but he rejected the suggestion that the *tubercle bacillus* was the "sole agent of disease."¹⁰² Dr. Webb, like many American scientists of his time, was unwilling to exclude the possible hereditary or environmental causes of tuberculosis, and he refused to dismiss the idea of diathesis – namely the idea that individuals by virtue of their environment or circumstances are conditionally predisposed to a particular disease. Dr. Herman M. Biggs, the Medical Officer and Director of the Bacteriological Laboratories at the Department of Health in New York City in 1903, knew that tuberculosis was contagious and bacterial in nature; however he "always felt that much harm has been

⁹⁹ Feldberg *Disease and Class* 41.

¹⁰⁰ Feldberg *Disease and Class* 42.

¹⁰¹ Feldberg *Disease and Class* 43.

¹⁰² Feldberg *Disease and Class* 44.

done by calling tuberculosis a contagious disease” because it causes too much “mental confusion” and detracts from the social aspects of the disease.¹⁰³

The diathetic nature of tuberculosis was often illustrated through use of the metaphor of “the seed and the soil.”¹⁰⁴ Diathesis points to multiple causes of disease, and according to nineteenth and twentieth century Americans, development of tuberculosis required not only the bacterial “seed” but also a fertile “soil” in which to flourish. According to this theory, environmental, hereditary, social, economic, and moral factors influenced whether “soil” of an individual was hostile or welcoming to the *tubercle bacillus*. Dr. Edward Trudeau, a New York physician and one of the most prominent figures in the nineteenth century tuberculosis debate, carried out a series of experiments to illustrate the diathetic nature of tuberculosis. Trudeau infected two groups of rabbits with the *tubercle bacillus* and exposed them to different living conditions. One group was confined to “a small, dark, cellar, and deprived...of adequate light, fresh air, and food”¹⁰⁵ while the other was allowed to roam outdoors and fed regularly. The majority of the former group died of tuberculosis, while the latter group had a relatively good survival rate. The conditions of the cellar that the first group of rabbits inhabited were likened to the “crowding, hunger, dampness, and darkness”¹⁰⁶ of the city. Dr. Ludwig Bremer, a contemporary of Trudeau based in St. Louis, argued that the “endless rush to the cities,” “centralization,” and the love of the “average proletarian...for the chorus of

¹⁰³ Biggs, Hermann M. “Tuberculosis – Its Causation and Prevention.” *A Handbook on the Prevention of Tuberculosis*. New York: The Charity Organization Society, 1903. 161.

¹⁰⁴ Feldberg *Disease and Class*.

¹⁰⁵ Feldberg *Disease and Class* 47.

¹⁰⁶ Feldberg *Disease and Class* 48.

citylife”¹⁰⁷ increased susceptibility to tuberculosis. Trudeau’s findings were used to lend credence to the popular belief that “the physiological state of the consumptive reflect deeper social and economic decay.”¹⁰⁸ Discussing Trudeau’s experiment, Mark Caldwell points out that “it was a small step from the physical atmosphere to the social one. If darkness, poor ventilation, and crowding were consumption’s handmaidens, the city was its mansion, fostering the conditions most favorable to it. The prevalence of tuberculosis became still another reason for despising urban blight, and that provoked a change in the way people viewed the disease itself...it now became an urban disease, particularly a disease of the poor, whose attraction to the life of the streets thus earned hygienic as well as moral opprobrium.”¹⁰⁹

The debate about the etiology and treatment of tuberculosis provided a forum for the discussion of urban social issues during a time in which these problems were becoming increasingly salient. This forum remained useful for some time, such that “well into the twentieth century, Americans held fast to an etiology that included microbes but also found room for malnutrition, unemployment, crowding, the living conditions in slums, and other social ills.”¹¹⁰ In her book *Disease and Class*, Georgina Feldberg argues that what was really at stake in the late nineteenth-century American debate about Koch’s findings was “the diathesis, the explanatory model that had bound together physiological and social causes of disease and served as a focus for mid-century campaigns against tuberculosis.”¹¹¹

¹⁰⁷ Feldberg *Disease and Class* 48.

¹⁰⁸ Feldberg *Disease and Class* 48.

¹⁰⁹ Caldwell *The Last Crusade* 33.

¹¹⁰ Feldberg *Disease and Class* 4.

¹¹¹ Feldberg *Disease and Class* 44.

In 1903, the Charity Organization Society of New York published *A Handbook on the Prevention of Tuberculosis*, which stressed the social factors in the prevalence of tuberculosis.¹¹² This handbook features an essay by Lilian Brandt entitled “The Social Aspects of Tuberculosis Based on a Study of Statistics,” in which Brandt argues that “there is no feature in the composition of a population which does not affect the prevalence of consumption.”¹¹³ Brandt discusses the effect of sex, age, occupation and marital condition on tuberculosis infection, but spends the most time discussing the role of race and ethnicity. Using tables and charts of statistics, Brandt states that “the most obvious comparison in the United States is based on the broad distinction of color,” with the consumption death-rate for “the colored being not far from three times the rate for the white.”¹¹⁴

In explaining the differences in mortality between races and ethnicities, Brandt draws heavily on stereotypes and generalizations. She writes that the Chinese are especially susceptible to consumption “as a natural consequence of their object in coming to America – to amass a fortune and take it back to China,” and because “their constitutions are weakened by drugs.”¹¹⁵ The prevalence of tuberculosis among Indians (Native Americans) is said to “illustrate the disastrous effect of civilization on a savage

¹¹² The Charity Organization Society of the City of New York. *A Handbook on the Prevention of Tuberculosis: The First Annual Report of the Committee on the Prevention of Tuberculosis*. New York: The Charity Organization Society, 1903.

¹¹³ Brandt, Lilian. “The Social Aspects of Tuberculosis Based on a Study of Statistics.” *A Handbook on the Prevention of Tuberculosis*. New York: The Charity Organization Society, 1903. 35.

¹¹⁴ Brandt “Social Aspects of TB” 48.

¹¹⁵ Brandt “Social Aspects of TB” 49.

race,” “the transition from life in the open to conditions of city life” and the “craze for ‘fire-water,’ against which the savage constitution has no power of resistance.”¹¹⁶

Brandt also stereotyped European immigrants; for example, the fact that Irish immigrants had a tuberculosis rate almost three times that of native-born whites and about twice that of other European born immigrants was explained by “the predilection of the Irish for the crowded parts of cities, the Celtic tendency to take no thought for the morrow, their frequent intemperance, and the generations of poverty behind them.”¹¹⁷

Not all of Brandt’s generalizations were negative. Italians, Russians, Hungarians and Poles were said to have lower rates of tuberculosis because “these nationalities are comparatively free from drunkenness.”¹¹⁸ Italians, especially, were praised for having “a temperament to which worry and anxiety are foreign.”¹¹⁹

Moving beyond simple generalizations about constitution and temperament, Brandt states that “the case of the negroes is more complex.” Like Native Americans, black people were perceived to suffer from living in “a civilization foreign to their nature, imposed upon them and not evolved by themselves.”¹²⁰ A 1936 article by John M. Gibson entitled “The Black Man and the Great White Plague” states that “the colored man living in the country has a much better chance of escaping death from tuberculosis and even the disease itself than his brother or cousin in the city.”¹²¹ Georgina Feldberg argues that this oft stated statistic was used to “affirm the virtues of the Southern climate

¹¹⁶ Brandt “Social Aspects of TB” 50.

¹¹⁷ Brandt “Social Aspects of TB” 53-54.

¹¹⁸ Brandt “Social Aspects of TB” 55.

¹¹⁹ Brandt “Social Aspects of TB” 55.

¹²⁰ Brandt “Social Aspects of TB” 50.

¹²¹ Gibson, John M. “The Black Man and the Great White Plague.” *Social Forces*. Vol. 14, No. 4. May, 1936. 586.

and way of life, and also justify an agrarian, slave-holding order.”¹²² Despite referring to “the ignorance and carelessness of the race in regard to laws of health”¹²³ and sanitation, and the “savage” nature of black people, Brandt argues that “even those who are inclined to think all the disabilities of the negroes inherent and ineradicable admit, however, that such disabilities are probably aggravated by the conditions under which they live.”

Brandt lays out what it perceives to be important constitutional differences between groups, but goes on to stress that the differences in TB mortality are due mostly to “a variety of social and economic influences.”¹²⁴

Brandt continually emphasizes the social aspects of tuberculosis, stating that “it is a social problem in several senses. The position it holds at the head of the column of death-dealing diseases makes it a matter of grave concern to all members of society; its prevalence depends largely on social conditions; in turn it aggravates social evils; and its practical eradication rests with social activity.”¹²⁵ The connection between consumption and poverty is more circular than linear: poverty breeds disease, and in turn, “sickness is found to be the cause of poverty in at least one case out of four.”¹²⁶ On behalf of the Charity Organization Society, Brandt argues that “the social results of consumption show why society should be concerned to eliminate this disease” and reminds its readers that “aside from the humanitarian considerations, it is palpably of interest to the more fortunate part of society to save itself from the consequences of a neutral attitude.”¹²⁷

¹²² Feldberg *Disease and Class* 21.

¹²³ Brandt “Social Aspects of TB” 51.

¹²⁴ Brandt “Social Aspects of TB” 56.

¹²⁵ Brandt “Social Aspects of TB” 32.

¹²⁶ Brandt “Social Aspects of TB” 109.

¹²⁷ Brandt “Social Aspects of TB” 111.

In light of tuberculosis' classification as a social disease and the perceived importance of both the "seed" and the "soil," late nineteenth and early twentieth-century treatments focused on modifying the individual and social "soil" to make them inhospitable to the *tubercle bacillus*. Mark Caldwell argues that although the blame for tuberculosis infection was placed on urban poverty and social evils instead of the individual's weak constitution, the consumptive was not absolved of responsibility. Unlike in the Romantic period, "the consumptive's plight was no longer a sign of heavenly favor, but an earnest of genetic inferiority, an unwillingness or inborn inability to seek the conditions and perform the actions that might ward sickness off...if you chose to live in filth, or were too unambitious or too lazy to work yourself out of the crowded tenement districts, or preferred indolent dozing by the fireside to brisk walks in the fresh air and sunshine, you were bringing tuberculosis on yourself."¹²⁸ Poor tuberculosis patients had a responsibility to improve their health and their social standing, as "the 1830s badge of delicate sensitivity had, in the increasingly practical, hard-minded, Darwinistic world of the 1870s, become a sign of corruption."¹²⁹ In turn, governments, private organizations, and philanthropic individuals turned their efforts toward preventing the spread of tuberculosis and treating poor patients.

At the turn of the century, "the legitimacy of science led to new standards for professional conduct, state action, and social interaction,"¹³⁰ and physicians and scientists were given a great deal of power. American physicians, philanthropists, and politicians believed that by improving the urban landscape and modifying people's behaviors they

¹²⁸ Caldwell *The Last Crusade* 35.

¹²⁹ Caldwell *The Last Crusade* 36.

¹³⁰ Feldberg *Disease and Class* 37.

could prevent the spread of tuberculosis. Through the treatment of tuberculosis, “a therapeutics of social reform enabled physicians, through medical prescriptions, to accomplish the behavioral transformations that defined the middle classes.”¹³¹

Realizing the threat of the tuberculosis in the United States, state and municipal governments began to pass laws, ordinances, and regulations in an effort to control the spread of TB. Almost all states had anti-spitting laws, as the tubercle bacillus was believed to be passed through sputum. No Spitting signs and public spittoons were common sights in the early twentieth century city. Public health departments emphasized that “spitting is dangerous, indecent and against the law.”¹³² Both official and private organizations strongly backed anti-spitting campaigns, and public expectoration became strongly frowned upon (as it continues to be to this day.) In the State health departments became more active in tuberculosis prevention and treatment efforts and received increased funding.¹³³ Many states also made it compulsory to register the death of consumptives so that officials could remove the body, disinfect the residence, and inform family members about treatment and prevention strategies.¹³⁴ In addition, the municipal governments of cities of 30,000 population and over often adopted their own set of legislation concerning TB. For example, Philadelphia, which had a population of 1,532,738 in 1908, passed an anti-spitting ordinance on March 9, 1903 that was “only fairly” enforced.¹³⁵ New York City enforced a strict Sanitary Code, which contained a “complete prohibition of promiscuous spitting in public,” and its Health Department

¹³¹ Feldberg *Disease and Class* 38.

¹³² Markel *When Germs Travel* 32.

¹³³ Jacobs, Philip P. *The Campaign Against Tuberculosis in the United States*. New York: The National Association for the Study and Prevention of Tuberculosis, 1908. 397.

¹³⁴ Jacobs *Campaign Against TB* 399.

¹³⁵ Jacobs *Campaign Against TB* 399.

conducted three special clinics, a hospital, and a sanatorium and educated the public through “the distribution of literature in large quantities, holding of exhibitions, and the giving of free public lectures.”¹³⁶

Not only were governmental authorities passing laws aimed at behavior modification, but also there was a spontaneous social response through the creation of private organizations and institutions. Urban sociologist Lewis Wirth argued that “being reduced to a stage of virtual impotence as an individual, the urbanite is bound to exert himself by joining with others of similar interest into organized groups to obtain its ends.”¹³⁷ Tuberculosis was certainly a topic of interest at the turn of the century, and this is illustrated by the foundation of an astonishing number of organizations and institutions devoted to the prevention of tuberculosis. These included, for example, The National Association for the Study and Prevention of Tuberculosis, The Pennsylvania Society for the Prevention of Tuberculosis, The Committee on the Prevention of Tuberculosis of the Charity Organization Society of New York City, and the Boston Association for the Relief and Control of Tuberculosis, among many others.

The National Association for the Study and Prevention of Tuberculosis was established in Philadelphia in 1904, when the “growth of the popular interest in the problem and the independent undertakings that were showing themselves in different parts of the United States” made the need for a national body of authority “keenly felt.”¹³⁸ In 1908, the Association published an impressive 467-page volume listing and describing the status of these “independent undertakings,” stating that “the development of the anti-

¹³⁶ Jacobs *Campaign Against TB* 388-389.

¹³⁷ Wirth, Louis. “Urbanism as a Way of Life.” 1938. from *The City Reader 3rd Edition*. Ed. Richard T. LeGates & Frederic Stout. New York: Routledge, 2003.103.

¹³⁸ Jacobs *Campaign Against TB* vii.

tuberculosis activity in the United States during the last ten years has been so rapid and the extension of its field so varied that the need of a comprehensive survey of the work is obvious.”¹³⁹ In separate chapters, this book discusses “Sanatoria, Hospitals, and Day Camps for the Treatment of Tuberculosis,” “Hospitals for the Insane Making Special Provision for their Tuberculous Patients,” “Penal Institutions Making Special Provision for their Tuberculous Inmates,” “Dispensaries and Clinics for the Special Treatment of Tuberculosis,” “Tuberculosis Classes,” and “Associations and Committees for the Study and Prevention of Tuberculosis.”¹⁴⁰

Dr. Lawrence F. Flick – the Philadelphia consumptive who went West in the 1880s to seek health - founded the first of these organizations in the United States, the Pennsylvania Society for the Prevention of Tuberculosis, in 1892. The National Association for the Study and Prevention of Tuberculosis granted the Pennsylvania Society “the honor of priority in the movement for organization of voluntary associations for educational and preventive work in the tuberculosis field.”¹⁴¹ Dr. Flick founded the Pennsylvania Society as part of his “crusade against tuberculosis,” in which he vehemently argued that it was “what you did and not where you were [that] made you well.”¹⁴²

Flick founded White Haven Sanatorium in 1901, under the belief that “tuberculosis is curable under the most primitive conditions, provided the patient is kept out of doors and given plenty of the right kind of food...the comforts of life are of

¹³⁹ Jacobs *Campaign Against TB* v.

¹⁴⁰ Jacobs *Campaign Against TB*.

¹⁴¹ Jacobs *Campaign Against TB* vii.

¹⁴² Flick *Lawrence Flick* 21.

secondary consideration and exposure to weather and cold may be disregarded.”¹⁴³

White Haven Sanatorium was one of many in the United States at that time, but it was unique in that Flick insisted that its services be provided to the poor, who he believed needed it most. Dr. Flick worked in an era when “Progressives placed their faith in bureaucracy as the best means of solving the social and economic problems that had arisen from the industrial system,”¹⁴⁴ and he used this to his advantage. Flick maintained connections with many important people of the time, and he frequently called upon their honorableness and philanthropic spirit, stating that “in the whole field of charity there is no nobler work” than to “bring about a mitigation of suffering to this army of victims of the great white plague.”¹⁴⁵

Flick was a strong proponent of the contagion theory of disease, and he believed that removing tuberculosis patients from their family and the community to a hospital or sanatorium was the best way to prevent the spread of tuberculosis.¹⁴⁶ He believed that because consumption was a contagious disease, it was therefore preventable, and that “if the first case that occurs in a family of poor people was removed to a hospital the others could be saved...other preventive measures are useless.”¹⁴⁷ Flick was involved in the establishment of the Rush Hospital for Consumption and Allied Diseases, the Free Hospital for Poor Consumptives, the Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis, and the National Association for the Study and Prevention of Tuberculosis.

¹⁴³ Flick *Lawrence Flick* 33.

¹⁴⁴ Ott *Fevered Lives* 112.

¹⁴⁵ Flick *Lawrence Flick* 26.

¹⁴⁶ Flick *Lawrence Flick* 26.

¹⁴⁷ Flick *Lawrence Flick* 27.

Although Flick made it his life's mission to serve the consumptive poor, he supported many beliefs and policies that discriminated against them. Flick portrayed consumptives as a public health threat, warning people that "consumptives are...to be found in all our places of industry, in our stores, in our factories, laundries, restaurants, in short everywhere where human effort ministers to the wants of others. In all such places their presence, unless precautions are taken, is a source of danger to fellow employees and to the public at large."¹⁴⁸ The physical and social structure of the industrial city brought poor consumptives and the bourgeoisie in constant contact, and Flick argued that the actions and movements of the infectious poor must be contained and controlled in order to protect the health of the middle and upper classes. He strongly supported laws that required people diagnosed with tuberculosis to register with health authorities and that isolated seriously afflicted individuals. These laws, however, were enforced differently in poor and wealthy neighborhoods, and "privately practicing physicians who treated the well-to-do were generally not required to report their tuberculosis patients to the public authorities while doctors working at free clinics, dispensaries, and other institutions that catered to the poor were."¹⁴⁹ Sanatoria were also aimed at controlling and disciplining the lives of consumptives; life in the sanatorium was "firmly guided by all kinds of rules: how to act, sleep, dress, exercise, what and when to eat, and even whom to associate with."¹⁵⁰ Tuberculosis prevention and treatment in the Industrial period aimed to shape urban residents into sanitary citizens who would be responsible for their own health and the health of the community.

¹⁴⁸ Ott *Fevered Lives* 114.

¹⁴⁹ Markel *When Germs Travel* 34.

¹⁵⁰ Markel *When Germs Travel* 37.

Treatment and prevention strategies were not limited to the individual. In the Industrial period, tuberculosis began to be “spoken of as inseparable from the life being lived around it,” and “the study of its sources and remedies [became] as much a branch of *urban planning* or domestic science as medicine.”¹⁵¹ Lilian Brandt argued that the density of populations living in cities increased tuberculosis rates because of the diminished “per capita allowance of sun and air.”¹⁵² Because of the strong impact of the urban environment on health, Brandt concludes that “the improvement of the housing of the working-classes and of the sanitary conditions of theatres and churches, as well as of factories and shops; the multiplication of parks and play-grounds, gymnasiums, and baths; the widening of streets; the enforcement of a standard of healthful conditions in all occupations; the reduction of the working-day; the raising of wages; the education of the workmen and girls of the tenements in the art of housekeeping and the science of food preparation; the crusade against the noxious features of the saloon; scientific instruction about the effects of alcohol in the public schools – all these and kindred efforts tend, less indirectly than might be thought, to reduce the death-rate from tuberculosis.”¹⁵³

¹⁵¹ Caldwell *The Last Crusade* 31. Emphasis added.

¹⁵² Brandt “Social Aspects of TB” 74.

¹⁵³ Brandt “Social Aspects of TB” 113.

Interlude: Tuberculosis Disappears

Rates of tuberculosis infection and death slowly began to decline throughout the industrialized world in the late nineteenth century.¹⁵⁴ Although tuberculosis remained a major contributor to mortality well into the twentieth century, its decline steadily continued until “TB had all but disappeared from the public view by the 1960s.”¹⁵⁵

Historians still debate the causes of this decline, which is somewhat mysterious in that it began long before an antibiotic cure for tuberculosis was discovered. Some give credit to the sanatoria and social campaigns of the Industrial period; Georgina Feldberg writes that the eradication of tuberculosis “owed far less to magic bullets or vaccines than to

¹⁵⁴ Engs *Clean Living Movements* 167.

¹⁵⁵ Feldberg *Disease and Class* 1.

extramedical factors such as public health activities and changing social conditions.”¹⁵⁶

In contrast, historian Thomas McKeown “established that the decline of tuberculosis and other infectious diseases in the industrial world was largely a result of rising standards of living rather than medical advances or state intervention in matters of public health.”¹⁵⁷

Likewise, in *Clean living Movements*, Ruth Clifford Engs attributes the decline of TB rates to “socioeconomic improvements, including less crowding, better nutrition, better ventilation, natural selection, and shortening of the work week.”¹⁵⁸

The gradual decline of TB morbidity and mortality, which began at the turn of the century, sped up significantly with the discovery of antibiotics able to kill tuberculosis. The first antibiotic successfully used to treat tuberculosis was streptomycin, which was discovered in 1943 at Rutgers University and used as a TB treatment for the first time in 1947.¹⁵⁹ A series of effective antibiotics came into use in the next twenty years, including isoniazid in 1952, rifampin in 1963, and pyrazinamide and ethambutol in 1967.¹⁶⁰ These drugs are still used to treat tuberculosis today.

The “great campaign” of antibiotic treatment “resulted in a progressive and massive reduction in both the infection rates and death rates from tuberculosis in every country throughout the developed world.”¹⁶¹ In comparison to the long history of the tuberculosis epidemic, the reduction in mortality beginning in the 1950s was very rapid,

¹⁵⁶ Feldberg *Disease and Class* 1.

¹⁵⁷ Barnes *Social Disease* 5.

¹⁵⁸ Engs *Clean Living Movements* 167.

¹⁵⁹ Ryan *The Forgotten Plague* 209-223.

¹⁶⁰ Ryan *The Forgotten Plague* 384.

¹⁶¹ Ryan *The Forgotten Plague* 384.

but Dr. Frank Ryan argues that “this revolution did not happen quickly...the change came about slowly, steadily, over two decades, from the mid-fifties to the mid-seventies.”¹⁶²

The discovery and proliferation of antibiotics and the successful campaigns against smallpox and polio made public health experts optimistic about the possibility of eradicating tuberculosis. To some extent antibiotics were “magic bullets,” but they only attacked tuberculosis from one angle, and the “antibiotic revolution of the 1940s and 1950s” engendered a “public health complacency”¹⁶³ that would prove disastrous. With plummeting morbidity and mortality rates, doctors specializing in tuberculosis switched their specialties and “the great sanatoria became redundant”¹⁶⁴ and closed down one by one. The “medical miracles” of the mid-twentieth century gave rise to “premature declarations of victory over tuberculosis”¹⁶⁵ and “tuberculosis began to fade from [the] consciousness” of “the ordinary man and woman in the street...after the mid-seventies, nobody seemed to die from it any more – or so it seemed.”¹⁶⁶ In the wealthy industrialized world, “a whole generation lived unaware that the disease existed (the forgotten plague, 385) – check quote

In assuming that antibiotics could (and would) eradicate tuberculosis, doctors, public health experts, and governments overlooked three major complications. First, dependence on solely biomedical treatment for a disease with an etiology as complex as TB’s effaces the importance of socio-economic factors to its incidence. Second, bacteria have the ability to evolve and adapt to their surroundings relatively rapidly, and this can

¹⁶² Ryan *The Forgotten Plague* 384-385.

¹⁶³ Gandy & Zumla *Return of the White Plague* 8.

¹⁶⁴ Ryan *The Forgotten Plague* 384.

¹⁶⁵ Markel, Howard. *When Germs Travel: Six Major Epidemics That Have Invaded America since 1900 and the Fears They Have Unleashed*. New York: Pantheon, 2002.18.

¹⁶⁶ Ryan *The Forgotten Plague* 385.

lead to antibiotic resistance. Third, rates of tuberculosis morbidity and mortality only plummeted in wealthy, industrialized nations, and “in the tragic arenas of the Third World, poverty, war, corruption and the lack of any effective medical infrastructure...allowed the disease to march on in horrifying proportion.”¹⁶⁷ In the second half of the twentieth century, the prevailing “myth of classical development theory”¹⁶⁸ led to the assumption that “the whole world was developing [and] soon all countries would be affluent enough to use the advanced technologies and acquire a modern health portrait.”¹⁶⁹ Unfortunately, “only recently have we begun to recognize the folly of extensive funding cuts in tuberculosis surveillance and treatment programs, and the unintended consequences of not investing in the basic health care needs of the most impoverished citizens of the world.”¹⁷⁰

The Global Period and the Resurgence of TB

Over the past two decades, the incidence of tuberculosis in the United States has begun to rise again. TB’s “comeback” came as a surprise to those who thought that the disease had been eradicated. However, if one considers the globalization of the world’s economy, the international migration of the world’s populations, and the growing connections between so-called “global cities,”¹⁷¹ it should come as no surprise that tuberculosis has reentered the sphere of the industrialized world, having never left that of

¹⁶⁷ Ryan *The Forgotten Plague* 385.

¹⁶⁸ Gandy & Zumla *Return of the White Plague* 2.

¹⁶⁹ Gandy & Zumla *Return of the White Plague* 4.

¹⁷⁰ Markel *When Germs Travel* 18.

¹⁷¹ Sassen, Saskia. “The Impact of the New Technologies and Globalization on Cities.” *Cities in Transition*. 2001. from *The City Reader 3rd Edition*. Ed. Richard T. LeGates & Frederic Stout. New York: Routledge, 2003. 212-220.

the Third World. In this section I will discuss the factors that have led to the resurgence of tuberculosis in the industrialized world and the emergence of drug-resistant strains. In his article “Evolving Infectious Disease Threats To National And Global Security,” David Heymann notes that “during the past 30 years, the infectious disease threat has diverged considerably from previous patterns of epidemiology, drug susceptibility, geographical distribution, and severity.”¹⁷² I will explore these patterns and the new metaphors of tuberculosis that they have wrought. I will describe the state of tuberculosis in the United States today and the efforts being made to fight the disease locally and internationally. Finally, I will discuss the obstacles to effective prevention and treatment and question whether TB might ever be eradicated in the way that a disease like smallpox was.

High standards of living and relatively effective health care systems utilizing antibiotic treatments have kept tuberculosis in check in the industrialized world for the past fifty years, and yet it is estimated that one third of the world’s population (that is 2 billion people) remains infected with the *Mycobacterium tuberculosis*.¹⁷³ Although only about ten percent of those infected actually develop the active disease, poor living conditions, malnutrition, and poverty can all weaken the immune system and exacerbate an infection. A healthy immune system is vital to controlling the destructive activity of the tubercle bacillus, and in places where latent TB infection is common like the cities of the Third World, anything that weakens the immune system is potentially deadly.

¹⁷² Heymann, David L. “Evolving Infectious Disease Threats To National And Global Security.” *Global Health Challenges for Human Security*. Ed. Chen, Lincoln, Jennifer Leaning, & Vasant Narasimhan. Cambridge: Harvard University Press, 2003. 106.

¹⁷³ Gandy & Zumla *Return of the White Plague* 11.

That said, the AIDS epidemic is probably one of the worst obstacles to containing tuberculosis today. In his book *The Forgotten Plague: How the Battle Against Tuberculosis Was Won – And Lost*, Dr. Frank Ryan calls the interaction between tuberculosis and AIDS “an alliance of terror.”¹⁷⁴ Dr. Ryan explains that “those very immune cells which are destroyed by the HIV virus are also the cells that enable the body to fight tuberculosis.”¹⁷⁵ HIV infection can activate a tuberculosis infection, and in addition studies have shown that “within two and a half months [of infection with HIV], the tuberculosis itself had the capacity to activate the HIV infection, causing it to blossom into full-blown AIDS.”¹⁷⁶ Dr. Lee B. Reichman, a specialist in tuberculosis and Executive Director of the New Jersey Medical School National Tuberculosis Center, describes the “timebomb” of tuberculosis that was set off by the AIDS epidemic: “in the early 1990s, in sub-Saharan Africa, Haiti, and Asia, the majority of adults already had latent tuberculosis infections. The TB bacteria were in their bodies, but their immune systems were keeping the bacteria in check. When AIDS came on the scene and destroyed these people’s immune systems, a waiting TB epidemic exploded.”¹⁷⁷ According to the Joint *United Nations Program on HIV/AIDS* “one-third of the people who are reported as dying of AIDS actually die of TB. Worldwide, TB is the *leading* killer of people with HIV/AIDS.”¹⁷⁸ And yet the AIDS epidemic has received much more attention than tuberculosis, a fact that Dr. Reichman describes as paradoxical, since “because tuberculosis is spread through the air by breathing, rather than specific risk

¹⁷⁴ Ryan *The Forgotten Plague* 389.

¹⁷⁵ Ryan *The Forgotten Plague* 389.

¹⁷⁶ Ryan *The Forgotten Plague* 401.

¹⁷⁷ Reichman, Lee B. *Timebomb: The Global Epidemic of Multi-Drug-Resistant Tuberculosis*. New York: McGraw-Hill, 2002. 50.

¹⁷⁸ Reichman *Timebomb* 49.

behavior, obviously it represents a much greater health threat to the world's population (more in developing countries than in industrialized ones) than HIV/AIDS.”¹⁷⁹

In addition to the AIDS epidemic, global trends of neo-liberal capitalism have exacerbated tuberculosis epidemics in the Third World, and “the resurgence of TB in the late twentieth century has taken place within the context of contemporary forms of globalization that are widening the gap between haves and have nots. Inequities being created within and across countries are providing fertile ground for the tubercle bacillus to thrive, creating distinct challenges for TB control programs.” (health policy, 182) Social upheavals, civil wars, and mass migrations have disrupted many populations in the past thirty years, and “the stress of war or forced migration...can play a role in the reactivation of dormant infection within the body.”¹⁸⁰ Neo-liberal policies of privatization have led to the dismantling of public health care systems, and in many countries where tuberculosis infection rates are high the private sector cannot fill the void.

Perhaps one of the worst flare-ups of tuberculosis in the past twenty years (which is still continuing today) is in post-perestroika Russia. At one point Russia had a relatively good tuberculosis control program, but when the Soviet Union disintegrated in 1991, “unemployment, social disruption, and alcoholism led to disarray in the health-care system,”¹⁸¹ and tuberculosis treatment programs fell apart. In 1991, 34 out of 100,000 Russian civilians had tuberculosis; by 1999, the incidence had risen to 85 per 100,000.¹⁸² Tuberculosis especially thrived in the prison system, which was filled to the brim as a

¹⁷⁹ Reichman *Timebomb* 51.

¹⁸⁰ Gandy & Zumla *Return of the White Plague* 11.

¹⁸¹ Reichman *Timebomb* 52.

¹⁸² Reichman *Timebomb* 53.

result of the fact that “petty crime was increasing, and the Russians were jailing more people than ever.”¹⁸³

The explosion of tuberculosis in developing countries is certainly a public health disaster, but why should a wealthy developed country like the United States care? Despite the fact that “ninety-five percent of all cases of tuberculosis occur among impoverished residents in developing countries,”¹⁸⁴ Dr. Reichman reminds us that “the vast majority of immigrants [to the United States], both legal and illegal, come from countries where TB is common.”¹⁸⁵ The current state of globalization, migration, and rapid international air travel allows the epidemics of developing countries to jump to developed ones. The realization that a disease like tuberculosis cannot be contained by national borders has made many developed nations wake up to the threat of TB. The resurgence of tuberculosis in the United States and Europe has “eroded past confidence that high standards of living and access to powerful medicines could insulate domestic populations from infectious disease threats abroad...they have also restored the historical significance of infectious diseases as a disruptive force – this time cast in a modern setting characterized by close interdependence of nations and instantaneous communications.”¹⁸⁶

In a time when international plane travel is relatively accessible, “the rapid international travel of people harboring deadly germs represents a real public health challenge.”¹⁸⁷ The United States attempts to prevent tuberculosis from crossing its

¹⁸³Reichman *Timebomb* 53.

¹⁸⁴Markel *When Germs Travel* 45.

¹⁸⁵Reichman *Timebomb* 55.

¹⁸⁶Heymann *Infectious Disease Threats* 107-108.

¹⁸⁷Markel *When Germs Travel* 22.

borders by defining potential visitors with active tuberculosis as “Class A” and barring their entrance into the country.¹⁸⁸ However, an infectious disease like tuberculosis has “particular advantages in terms of invisibility, mobility, adaptability, and silent incubation periods that render national borders meaningless. Infectious agents, incubating in symptomless air travelers, can move between any two cities in the world within 36 hours and slip undetected past any border.”¹⁸⁹ A flier with active tuberculosis poses a grave threat to his or her fellow passengers breathing the same re-circulated air on a plane, a fact which the World Health Organization recognized in 1998 when it declared that “flights of more than 8 hours posed the risk of exposing passengers and crew to infectious tuberculosis.”¹⁹⁰ The public was reminded of this risk recently when a flurry of media coverage surrounded a tubercular man who took several international flights, which I will discuss later.

It is not only the movement and behavior of people that is fueling the tuberculosis epidemic; the tubercle bacillus itself is rapidly adapting to its environment, mainly by developing resistance to the antibiotics used to kill it. *Mycobacterium tuberculosis*, like all infectious disease agents, has the ability to “readily and rapidly multiply, mutate, adapt to new hosts and environments, and evolve to resist drugs. This natural propensity to change has been greatly augmented by the pressures of a crowded, closely interconnected, and highly mobile world, which has given infectious agents unprecedented opportunities to exploit.”¹⁹¹ Treatment of tuberculosis requires administering multiple antibiotics every day for an extended period of time (usually about

¹⁸⁸ Reichman *Timebomb* 3.

¹⁸⁹ Heymann *Infectious Disease Threats* 106.

¹⁹⁰ Reichman *Timebomb* 6.

¹⁹¹ Heymann *Infectious Disease Threats* 106.

six months.) This requires a good deal of organized effort on the part of both the patient and the doctor, and where health care systems are poor and supplies of antibiotics are unreliable, the course of treatment is often incomplete. Incomplete or intermittent treatment allows the tubercle bacillus time to develop mutations that allow it to resist antibiotics, and when bacteria with these mutations multiply, the patient develops a strain of tuberculosis that cannot be treated with the normal set of drugs.

The WHO and the International Union Against Tuberculosis and Lung Disease have defined Multi-Drug Resistant Tuberculosis (MDR TB) as strains that are “resistant to the two strongest and most important TB drugs, isoniazid and rifampin.”¹⁹² MDR TB can be treated with other sets of antibiotics, but these drugs often have worse side effects, can take up to four times as long to be effective, and can cost up to 100 times more.¹⁹³ Meanwhile, tuberculosis strains continue to accrue drug resistance, and recently the WHO and the CDC (Center for Disease Control) have defined XDR TB (extensively drug-resistant tuberculosis) as “the occurrence of TB in persons whose *M. tuberculosis* isolates are resistant to isoniazid and rifampin plus resistant to any fluoroquinolone and at least one of three injectable second-line drugs (i.e., amikacin, kanamycin, or capreomycin.)”¹⁹⁴

The spread of drug resistant strains of tuberculosis is a serious global health threat that has begun to garner media attention. Andrew Speaker, a 31 year-old Atlanta based lawyer, was diagnosed with tuberculosis in the spring of 2007. He then proceeded to fly

¹⁹² Reichman *Timebomb* 4.

¹⁹³ Heymann *Infectious Disease Threats* 107.

¹⁹⁴ Centers for Disease Control. Morbidity and Mortality Weekly Report (MMWR). *Revised Definition of Extensively Drug Resistant Tuberculosis*. Nov. 3, 2006. Dec. 10, 2007. <<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5543a4.htm>>.

to Paris, Athens, Mykonos, Rome, Prague, and Montreal, against his doctor's recommendations, for his wedding and honeymoon. An international uproar ensued, when tests revealed that Speaker had an extensively drug-resistant form of tuberculosis. When Speaker returned to the United States, the Centers for Disease Control (CDC) placed him under involuntary isolation, making him the first person to be quarantined by the federal government since 1963.¹⁹⁵ The CDC defended their decision to detain Speaker, explaining that although Speaker's case was a "low-probability/high-consequence" scenario, the CDC decided to always exercise the "precautionary principle" when dealing with public health issues (especially after the 2001 anthrax cases.)¹⁹⁶

A Washington Post article entitled "The Two Faces of Tuberculosis: Lawyer's Illness Brings the World's Public Health Woes Home," pointed out that Speaker's case "provided a crash course in one of the 21st century's least recognized health threats," and it "accomplished in two weeks what a small army of epidemiologists and advocates has not in a decade: given drug-resistant TB a Paris-Hilton-like spot in the popular consciousness."¹⁹⁷ The article likened XDR TB to pandemic flu, SARS, and anthrax, and quoted Henry M. Blumberg, a TB expert at Emory University School of Medicine, who called TB a "weapon of mass destruction."¹⁹⁸ The article stated that transmitting XDR-TB to others would be "unforgivable," and in fact, nine individuals, eight of whom were

¹⁹⁵ Conant, Eve. "Andrew Speaker Says He's Being Unfairly Attacked." *Newsweek*. June 2, 2007.

¹⁹⁶ Brown, David. "The Two Faces of Tuberculosis." *Washington Post*. Tuesday, June 19, 2007. Page HE01.

¹⁹⁷ Brown "Two Faces of TB."

¹⁹⁸ Brown "Two Faces of TB."

on the same Prague-Montreal flight as Speaker, have filed a suit against him for possibly exposing them to XDR TB.¹⁹⁹

Although the controversy over Andrew Speaker is dying down, his case can be viewed as a milestone in that it showed “what can happen when the affluent precincts of the global village ignore what is happening in the poorer ones...the existence of XDR-TB in the lungs of a young, healthy Atlanta trial lawyer is evidence that the world needs to do a lot better at finding, treating, and preventing tuberculosis in poor countries.”²⁰⁰

Affluent countries like the United States can no longer ignore dangerous epidemics and poor health care systems in the Third World because infectious diseases like TB, AIDS, avian flu, and SARS can potentially affect anybody. Tuberculosis differs from pandemic flu or SARS, however, because it “does not emerge explosively” and yet it affects much more of the world’s population. The tuberculosis epidemic has changed many epidemiologists’ notions of health risk and illustrates that it “may be necessary to fight epidemics that, unlike classical plagues of history, can take decades to develop.”²⁰¹ In addition, unlike the flu or SARS, tuberculosis “cannot be stopped by halting or limiting the movement of whole populations” but instead requires “the prolonged cooperation – either willing or enforced – of every patient.”²⁰² As globalization shortens the connections between nations and individuals, Speaker’s case illustrates how much “the perceptions of single patients can affect the public health.”²⁰³

¹⁹⁹ Farrell, Sean. “Nine File Suit Against TB-Infected Man.” *Associated Press*. June 12, 2007.

²⁰⁰ Brown “Two Faces of TB.”

²⁰¹ Brown “Two Faces of TB.”

²⁰² Brown “Two Faces of TB.”

²⁰³ Brown “Two Faces of TB.”

The resurgence of the tuberculosis epidemic and the development of drug resistance has often been blamed on noncompliant patients in the Third World, yet conditions in the United States have also contributed to the problem. Poor populations in America's inner cities often receive health care that is at a "third-world standard," which Dr. David Hilfiker, who works as a physician in Washington D.C., describes as "poverty medicine."²⁰⁴ Poor conditions in U.S. cities have been exacerbated over the past thirty years, raising the incidence of tuberculosis risk factors. Rates of homelessness have risen, due in part to the deinstitutionalization of patients in state psychiatric hospitals in the 1970s and the closing of single-room occupancy hotels.²⁰⁵ Drug abuse, especially the use of crack cocaine and heroin, has increased, and "the growth of homelessness among urban drug abusers in the 1980s paralleled the spread of HIV infection, greatly complicating tuberculosis treatment and probably promoting further spread of this infection."²⁰⁶ Homelessness, alcoholism, and drug abuse have been shown to be "very important predictor[s] of noncompliance"²⁰⁷ in tuberculosis treatment, which can lead to the development of drug-resistant forms of disease. As risk factors for contracting tuberculosis increased, tuberculosis control programs were phased out, and the amount of funding and effort going toward the prevention and treatment of TB declined. The public health institutions and philanthropic organizations aimed at fighting tuberculosis, which flourished in late nineteenth and early twentieth centuries, were largely defunct by the

²⁰⁴ Hilfiker, David, M.D. *Not All of Us Are Saints: A Doctor's Journey with the Poor*. New York: Ballantine Books, 1994. 11.

²⁰⁵ Feldman, Saul. "Out of the Hospital, onto the Streets: The Overselling of Benevolence." *The Hastings Center Report*. June, 1983. Vol. 13, No. 3. 5-7.

²⁰⁶ Brudney, Karen & Jay Dobkin. "Resurgent Tuberculosis in New York City: Human Immunodeficiency Virus, Homelessness, and the Decline of Tuberculosis Control Programs." *Journal of Public Health Policy*. Vol. 12, No. 4. Winter, 1992. 435.

²⁰⁷ Brudney & Dobkin "Resurgent TB" 445.

end of the twentieth century. During this time there was also a “boom in immigration from nations where TB is common.”²⁰⁸

The effect of this combination of factors on rates of tuberculosis infection played out dramatically in the 1980s and 1990s in New York City. Like “every other city throughout the industrialized world,” New York “saw an unrelenting fall in the numbers of its citizens contracting tuberculosis from the 1950s onwards.”²⁰⁹ Tuberculosis cases steadily declined as the city of New York spent a good deal of money on TB treatment and prevention programs. However, reported TB cases in New York City began increasing in 1979 after, “basking in the glow of overconfidence and changing budget priorities, New York City began to execute massive funding cuts for almost every public health program, especially those directed at tuberculosis control.”²¹⁰ Tuberculosis rates rose throughout the 1980s, reaching their peak in 1992, when the case rate was almost three times what it was in 1979.²¹¹ The prevalence of tuberculosis was especially high in hospitals and prisons, which became breeding grounds for drug resistance.²¹² In addition, the high incidence of tuberculosis among homeless males with high rates of alcoholism and unemployment meant that noncompliance with drug regimes was rampant.²¹³ At the height of the epidemic in 1992, the New York Times ran a five part series about the threat of tuberculosis, bringing TB into the public spotlight for the first time in years. Realizing the seriousness of the situation, the city of New York ended up spending more than one

²⁰⁸ Markel *When Germs Travel* 44.

²⁰⁹ Ryan *The Forgotten Plague* 398.

²¹⁰ Markel *When Germs Travel* 44.

²¹¹ Markel *When Germs Travel* 44.

²¹² Ryan *The Forgotten Plague* 399.

²¹³ Brudney & Dobkin “Resurgent TB” 438.

billion dollars on tuberculosis treatment and prevention, and the case rate soon fell by ninety-one percent.²¹⁴

The New York TB epidemic was quelled with the application of a great deal of money and effort, but American cities continue to face the threat of tuberculosis outbreaks, and they must be vigilant in order to prevent them. Prevention and treatment of tuberculosis requires that “vital factors in the deprived inner cities, particularly homelessness, alcoholism, drug addiction, and the shoddy medical services that accompany poverty” be brought under control and given “sympathetic attention.”²¹⁵ In a 1992 study, Karen Brudney and Jay Dobkin argue that in order to control tuberculosis in American cities, “long abandoned strategies will need to be reinstated for homeless and non-compliant patients: prolonged initial hospitalization, residential TB treatment facilities, and aggressive community-based supervision.”²¹⁶ However, as Dr. Ryan points out, “even these measures, expensive as they will prove, are no more than a beginning, and they will eventually fail if the wealthy countries simply look to themselves.”²¹⁷

Modern scientific technologies are also being used to attempt to solve the problem of tuberculosis. Scientists have sequenced the *M. tuberculosis* genome with the hopes of uncovering some of its mysteries. Recent studies have also investigated possible genetic susceptibility to TB. For example, a recent study in the *New England Journal of Medicine* found that genetic factors may affect susceptibility to tuberculosis. Richard Bellamy et al. studied variation in the NRAMP1 gene in people living in the Gambia, and

²¹⁴ Markel *When Germs Travel* 45.

²¹⁵ Ryan *The Forgotten Plague* 413.

²¹⁶ Brudney & Dobkin “Resurgent TB” 446-447.

²¹⁷ Ryan *The Forgotten Plague* 413.

they concluded that variation in this gene affects susceptibility to TB in West Africans.²¹⁸ New discoveries like this are a reminder that we still have much to learn about the ways in which *M. tuberculosis* affects human bodies.

Currently, the World Health Organization recommends a specific treatment strategy for tuberculosis called DOTS (directly observed treatment, short-course.) The DOTS program is utilized worldwide and is focused on lowering rates of non-compliance among TB patients. The DOTS strategy is to “treat TB cases by directly observing their medication intake for six to eight months. This is to ensure that medication is taken in the right combination and appropriate dosage in an effort to prevent the development of multidrug resistant TB.”²¹⁹ The WHO lists five basic components of the DOTS strategy, which is the cornerstone of their Stop TB campaign: (1) Political commitment with increased and sustained financing, (2) Case-detection through quality-assured bacteriology, (3) Standardized treatment with supervision and patient support, (4) An effective drug supply and management system, and (5) Monitoring and evaluation system and impact measurement.²²⁰ The WHO’s goal is to implement DOTS worldwide to slow the evolution of drug resistance, to reduce transmission of TB and protect the community, and to treat active cases.

There is a DOTS clinic in Center City Philadelphia, named after Dr. Lawrence F. Flick. As the clinical site for the Philadelphia Department of Public Health’s

²¹⁸ Bellamy, Richard. “Variations in the NRAMP1 Gene and Susceptibility to Tuberculosis in West Africans.” *The New England Journal of Medicine*. Vol. 338, No. 10. March 5, 1998. 640-644.

²¹⁹ World Health Organization. *What is DOTS?* Stop TB initiative. Dec. 15, 2007. <http://www.wpro.who.int/sites/stb/dots_definition.htm>.

²²⁰ World Health Organization. *Tuberculosis (TB) Programmes and Projects*. Dec. 15, 2007. <<http://www.who.int/tb/dots/en/>>.

Tuberculosis Control Program, the Lawrence F. Flick Memorial Center is the only publicly funded TB clinic in Philadelphia. Opened in 1998, its purpose is to “provide state of the art diagnostic treatment services to all of the citizens of Philadelphia who are known or suspected of having tuberculosis infection or disease,” and it also serves as a referral center for complicated TB cases from other districts in Pennsylvania.²²¹ On Monday through Friday from 7:30 a.m. to 1:00 p.m., patients must go to the clinic to take their medicine. DOTS medications and clinical evaluations are provided free of charge, and patients are given mass transit tokens, snacks, and other incentives in order to boost compliance. The Flick Center makes a special effort to evaluate and treat newly arrived immigrants who have come from countries where TB is common.²²²

One criticism of DOTS is that it is a “paternalistic, authoritarian system” that removes patients’ autonomy.²²³ DOTS programs center on the notion of “zero tolerance,” and in the United States a failure to adhere to DOTS therapy can result in detention. During the New York tuberculosis in the 1990s, “to address the problem of poor compliance, the state’s authority was expanded and a variety of other measures were taken. The city’s public health codes were amended to give the commissioner of health the authority to detain noncompliant, noninfectious individuals for long periods.”²²⁴ As seen in the case of Andrew Speaker, the CDC maintains the right to detain and treat tuberculosis patients against their will. In this way, the perception of the deviant

²²¹ City of Philadelphia. *Health: Tuberculosis (TB) Control*. Dec. 15, 1007. <http://www.phila.gov/health/units/tb/Flick_Center.html>.

²²² City of Philadelphia website.

²²³ Coker, Richard J. *From Chaos to Coercion: Detention and the Control of Tuberculosis*. New York: St. Martin’s Press, 2000. 10.

²²⁴ Coker *Chaos to Coercion* 12.

consumptive of the Industrial period is still relevant today, and TB patients are seen as people that must be controlled and disciplined.

Nevertheless, DOTS has been successful in that it has contributed to the cure of many tuberculosis patients, but there are some cases in which it is not sufficient. Patients that already have MDR TB or XDR TB will not respond well to the standard DOTS treatment, which in some cases can exacerbate the infection and lead to further development of drug resistance. Dr. Paul Farmer describes “the spectacle of [Russian] prisoners receiving directly observed therapy with the wrong drugs” because of the “rigid adherence” to the DOTS strategy.²²⁵ Farmer agrees that “DOTS should be the cornerstone of tuberculosis control around the world,” but he points out that “its success depends on the efficacy of the antibiotics used.”²²⁶ In response to this problem, Farmer designed a program called “DOTS plus,” in which the drug regime is tailored to the individual’s drug resistance. Unfortunately, DOTS plus is much more expensive and complicated to manage than DOTS.

Another obstacle to effective treatment is that medication alone cannot cure tuberculosis in people that additionally suffer from severe poverty and malnutrition. Noncompliance to drug regimens, especially in foreign countries, is often attributed to “*cognitivist-personalistic*” theories that emphasize individual patient agency and cultural barriers like belief in sorcery.²²⁷ Dr. Paul Farmer, who works in conditions of extreme poverty in Haiti, argues that more attention should be paid to “*structural*” causes of non-

²²⁵ Farmer, Paul. *Pathologies of Power: Health, Human Rights, and the New War on the Poor*. Berkeley: University of California Press, 2005. 124.

²²⁶ Farmer *Pathologies of Power* 124.

²²⁷ Farmer *Pathologies of Power* 149.

compliance that emphasize a patient's poverty.²²⁸ Farmer uses the term "structural violence"²²⁹ to describe global and local inequalities that inflict harm on people's health and well being. Farmer carried out a case study at his clinic in Haiti to illustrate the role of structural factors in the treatment of tuberculosis. All TB patients at Farmer's clinic received free care and antibiotics under the DOTS strategy. Farmer devised an "enhanced package" in which patients would "receive financial aid of thirty dollars per month for the first three months; would be eligible for nutritional supplements; would receive regular reminders from their village health worker to attend the clinic; and would receive a five-dollar honorarium to defray 'travel expenses' (for example, renting a donkey) for attending the clinic."²³⁰ He made this package available to fifty patients, while the rest of his patients received the standard free DOTS care, and he found that "the difference in the outcomes of the two groups was little short of startling."²³¹ After about a year, 46 out of 50 of the test patients had no TB symptoms and none of them still had active TB. The control group was about half as successful.²³²

Farmer's study, although small in scale, illustrates that biomedical treatment is not sufficient to treat tuberculosis; as long as poverty, malnutrition, and poor living conditions exist, people will continue to suffer from TB. In order to fight tuberculosis, we must fight poverty and inequality, both locally and globally. As globalization increases the connections between people and nations, an international effort must be

²²⁸ Farmer *Pathologies of Power* 149.

²²⁹ Farmer *Pathologies of Power* 22.

²³⁰ Farmer *Pathologies of Power* 149.

²³¹ Farmer *Pathologies of Power* 150.

²³² Farmer *Pathologies of Power* 150.

made to improve living conditions and reduce poverty worldwide in order to protect people's health.

Conclusion

Katherine Ott writes that “the history of illness is about how we as a culture, varied and complex, cope with our mortality, difference, and debility and how we place ourselves within and make sense of the communities around us.”²³³ Looking at the history of tuberculosis, one can see the ways in which urban populations have attempted to make sense of an ever-present, life-threatening illness. The words consumption, tuberculosis, and MDR TB have evoked different images over time, and narratives about tuberculosis have been (and continue to be) informed by varying social and cultural settings. The life of the city plays a vital part in shaping these evolving settings.

²³³ Ott *Fevered Lives* 8.

In this essay, I have described how a Romantic view of consumption was replaced during the Industrial period by the perception of tuberculosis as a social disease of the urban poor. In the twentieth century, tuberculosis “disappeared” from the Western world, only to return in deadly drug-resistant forms in the Global period. Over the past two hundred years, while overall knowledge about tuberculosis has increased a great deal, there are still large gaps in our understanding of the disease. Theories about the cause and treatment of tuberculosis are much more sophisticated today than they were a century ago, yet some of the perceptions about TB in the Romantic and Industrial periods still have some relevance. For example, the nineteenth century belief in the hereditary nature of tuberculosis was rejected with the discovery of the tubercle bacillus and infectious disease theory. However, Richard Bellamy’s study about genetic variation in the NRAMP1 gene shows that in some ways susceptibility to tuberculosis can be inherited.²³⁴ Findings such as this suggest that some historical beliefs about tuberculosis may contain kernels of truth that should not be rejected when perceptions change. Although theories about the social and economic causes of tuberculosis in the Industrial period were tinged with racist, eugenicist beliefs, we must not exclude the sociological aspects of disease today in favor of a purely biomedical approach. Historical perceptions of tuberculosis can be polished and refined to fit the current environment instead of rejected outright.

Dubos & Dubos remark that “the ‘tubercular diathesis’ of the old physicians was not such an empty concept after all...the hereditary constitution, the physiological state, the nature of the environment and all the stresses and strains of life are of paramount

²³⁴ Bellamy “Variations in NRAMP1 Gene.”

importance in determining whether infection will manifest itself in the form of progressive disease.”²³⁵ While Industrial period physicians concentrated on the “soil” rather than the “seed”, the Global period focuses on eradicating the seed (*M. tuberculosis*) and largely ignores poor conditions of the soil. Current tuberculosis treatment strategies center around research and development of new antibiotics and the global implementation of the DOTS program. These are both important goals, but as long as people are forced to live in conditions that make them susceptible to TB, the disease will not be eradicated. Examination of morbidity and mortality trends in European and American cities in the late nineteenth and early twentieth centuries shows that “the eradication of tuberculosis, a disease born and bred of poverty, owed far less to magic bullets or vaccines than to extramedical factors such as public health activities and changing social conditions.”²³⁶ The fact that structural changes and improved living conditions in cities played a huge role in the reduction of illness and death from tuberculosis in the industrialized world suggests that poor urban living conditions in the developing world must be addressed in order to treat TB today.

Historically, certain individuals and groups have been associated with tuberculosis and have been blamed for its spread. In all three periods that I have described, the burden of TB is placed more on the individual than his surroundings. The Industrial period came close to addressing structural causes, but the prevalence of tuberculosis in poor urban slums was just as often blamed on the innate inferiority of its inhabitants as it was on the environment. Today, individual patients, especially those in Third World countries, are blamed for creating drug-resistant strains of tuberculosis

²³⁵ Dubos & Dubos *The White Plague* 128.

²³⁶ Feldberg *Disease and Class* 1.

through their failure to comply with treatment. However, Paul Farmer's Haiti study suggests that issues of non-compliance are less the fault of the individual than the result of "structural violence."²³⁷ In order to address the tuberculosis epidemic today, one must change the ways that one conceptualizes the disease, especially in terms of who is deemed responsible for prevention, infection, and treatment. The DOTS program has succeeded in many ways, but in the end, the burden and the blame remain on the individual patient. If blame is shifted to structural aspects of poverty and inequality, treatment and prevention programs can focus on improving peoples' surroundings as well as fixing their bodies.

The state of the city plays a vital role in the fate of tuberculosis, and the interplay between the city and TB shows that urban conditions can both exacerbate and improve the tuberculosis epidemic. Future considerations of tuberculosis should take into account the integral role of cities in its history, development, and current identity.

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²³⁷ Farmer *Pathologies of Power*.

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