Central Sanitation:

Why Centralization Caused the Downfall of the Early Public Health Movement in Victorian Britain.

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Public health became a pressing issue in Britain during the nineteenth century. With the exception of the bubonic plague, epidemics were an uncommon issue for most of Britain's population prior to this period because a large majority of the population was dispersed across wide, rural areas in small communities. Although diseases could circulate easily among the minority who lived in the densely populated setting of towns, the space between the rural majorities made the spread of disease a far less significant issue for them.[1] This changed with the new economic opportunities brought about by the Industrial Revolution. An unprecedented migration from rural areas to towns occurred as people flocked to job opportunities in factories.[2] The proportion of Britain's population living in large towns increased from one-fifth in 1801 to over half by 1851.[3] As a result, far more of Britain's population was exposed to the close-quarters environment of towns, a dangerous environment in which rapid population expansion and development promoted the spread of disease. Development of key infrastructure such as housing, drainage, and amenities was haphazard and unplanned due to the unprecedented rapidity of the towns' expansion. Overcrowding, poorly constructed housing, a lack of fresh air, as well as ever-present dirt and human waste was the result. The water supplies of towns were just as unclean. Whether taken from local sources such as wells, or acquired from the various competing water companies, the water used by the towns of early nineteenth-century Britain was consistently polluted.[4] These conditions caused a severe deterioration of public health. Britain's mortality rate, which had been in decline since 1780, began to rise again in 1810. William Farr, a significant scientist and statistician of the Victorian era, noted in 1849 that the significantly

[1] Derek Fraser, *The Evolution of the British Welfare State* (London: MacMillan Press, 1973), 51.
[2] Eric E. Lampard, "The Urbanizing World," in *The Victorian City: Images and Realities,* eds. H.J Dyos, and Michael Wolff (2 vols, London: Routledge & Kegan Paul, 1973), 12-13.
[3] Ibid., 4.
[4] Ibid., 21-22.

higher mortality rate of urban centers was tied to an increased level of debilitating sickness and epidemics. The dangers of the town environment were especially hazardous for the working class who suffered the worst from issues of malnutrition, exposure, and exhaustion, all of which severely weakened their immune systems. This made them more likely to contract diseases, and increased the likelihood of permanent disability or death as a result.[5]

Although issues of public health were becoming increasingly apparent in the early nineteenth century, little was done to resolve them. Why did such deadly social ills not catch the attention of government? Firstly, the ideas of benevolent government, sentimentality, as well as a relationship of patronage between higher and lower classes that had developed in the eighteenth century, began to give way to the much more individualistic ideas that shaped the Victorian period. These new ideas, such as ruthless competition in the marketplace, self-improvement, and laissez-faire government, did not promote the philanthropic motivations that would normally inspire public health efforts.[6] Thus, the implementation of public health measures could not have a solely philanthropic motivation: there also needed to be a utilitarian incentive. Secondly, the middle and upper classes were largely unaware of the extent of the problem. As towns became an unsavoury environment, most of the middle class took advantage of new advancements in transportation and moved out to suburbs, separating their work in the town center from their homes outside of it. As a result, the middle and upper classes did not see, or did not care to see, the problem of epidemics among the working class in towns.[7] Thus, they did little to prevent epidemics other than those which might impact them. For example, the first outbreak of cholera

[5] George Rosen, "Disease, Debility, and Death," in *The Victorian City: Images and Realities,* eds. H.J Dyos, and Michael Wolff (2 vols, London: Routledge & Kegan Paul, 1973), 626-627.
[6] Christopher Hamlin, *Public Health and Social Justice in the Age of Chadwick: Britain, 1800-1854* (Cambridge: Cambridge University Press, 1998), 3.
[7] H.J. Dyos, and D.A. Reeder, "Slums and Suburbs," in *The Victorian City: Images and Realities,* eds. H.J Dyos, and Michael Wolff (2 vols, London: Routledge & Kegan Paul, 1973), 369-370.

in London from 1831 to 1832 caused a sufficient crisis to prompt the creation of local boards of health, with medical officers empowered to combat epidemics. However, when there was no crisis, medical officers were only attached to the Poor Law and could only operate in a limited manner, while dedicated local boards of health did not exist in the first half of the nineteenth century.[8] The implementation of public health measures was dependent on enough publicity being given to issues of health for the middle and upper classes to take notice.

Nevertheless, a push for public health reform began in the 1830s. Reformers conducted investigations into disease and its effects on the working class. These reformers were encouraged by Edwin Chadwick[9], a man who would become the face of the coming public health movement. Chadwick was a key contributor to the New Poor Law of 1834 and became a secretary to the Poor Law Commission.[10] In Chadwick's Poor Law Report, he had assumed that the able-bodied poor were the reason why poor relief costs were so high, so eligibility for poor relief was reduced under the New Poor Law to lower its cost on the British government. However, in his first couple of years acting as secretary of the Poor Law Commission, Chadwick came to realise that poor relief was largely going to those affected by disease. Dependents such as women and children became destitute when their husbands or fathers, almost invariably the breadwinner of the family in Victorian times, were debilitated or killed by disease. This persuaded Chadwick that the effectiveness of the New Poor Law and the reduction of the cost of poor relief were tied to disease prevention.[11] This created a utilitarian justification for pursuing public health reform. If preventable disease created a financial drain upon the British state and reduced its productive

[8] Anthony S. Wohl, "Unfit for Human Habitation," in *The Victorian City: Images and Realities,* eds. H.J Dyos, and Michael Wolff (2 vols, London: Routledge & Kegan Paul, 1973), 604.
[9] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 134.
[10] S.E. Finer, *The Life and Times of Sir Edwin Chadwick* (London: Methuen & Co., 1952), 96.
[11] Derek Fraser, *The Evolution of the British Welfare State* (London: The MacMillan Press, 1973), 56-57.

capacity, it only made sense to engage in prevention.[12] Chadwick also hoped that pursing preventative measures against destitution would increase the popularity of the much-detested New Poor Law.[13] An outbreak of typhus in 1838 prompted Chadwick and health reformers to begin working together. They created a report by compiling past research into the health of towns, eventually catching the attention of parliament. Chadwick was instructed to conduct an inquiry into the sanitary conditions of the working class. Taking this inquiry as an opportunity, Chadwick began working on a scheme to implement public health reform. This scheme would be largely influenced by his own predisposition towards utilitarianism, bureaucracy, and the miasmatic theory of infection.[14] Chadwick's recommendations were outlined in his *Report on the Sanitary Conditions of the Labouring Population of Great Britain,* also known as the Sanitary Report*,* published in 1842. This report led to the implementation of the Public Health Act in 1848, which created a General Board of Health to regulate local boards in the pursuit of improved sanitation. However, by 1854 the General Board was stripped of much of its power, and Chadwick, who had been appointed to the board, was dismissed. In 1858, the General Board was discontinued and the Public Health Act of 1848 was replaced. What caused this sudden downfall?

Britain's first significant public health movement, which will be referred to as the early public health movement, began with the publishing of the Sanitary Report in 1842 and resulted in the creation of public health legislation that lasted until 1858. The collapse of this movement's achievements is often attributed simply to Chadwick's efforts to centralize control over public health under a single authority, the General Board of Health. Why exactly did centralization

[12] Alexander P. Stewart, and Edward Jenkins, *The Medical and Legal Aspects of Sanitary Reform,* ed. M.W. Flinn, (New York: Humanities Press, 1969), 80.
[13] S.E. Finer, *The Life and Times of Sir Edwin Chadwick* (London: Methuen & Co., 1952), 147.
[14] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 134-136.

cause such issues for the early public health movement? There were four main groups from which opposition arose: the medical community, engineers, businesses, and local governments. These groups will be examined in relation to why and how they opposed Chadwick's centralizing efforts during the pursuit of public health legislation from 1842 to 1848, as well as during the General Board's operation from 1848 to 1854. In so doing, it will be demonstrated that centralization caused the downfall of the early public health movement because it made enemies of these four influential groups.

1842-1848: The Pursuit of Public Health Legislation

Following the release of the Sanitary Report in 1842, the early public health movement became highly popular despite being conceptually opposed to the usual laissez-faire Victorian attitude,[15] largely owing to promotion by Chadwick and his associates. Ten thousand copies of the Sanitary Report were distributed for free, bringing a significant amount of attention to the issues it treated. The Sanitary Report initially provoked little opposition as it was heaped with praise from journalists, civil servants, and politicians.[16] A royal commission known as the Health of Towns Commission was appointed in 1843, resulting in the formation of the Health of Towns Association in 1844. The Health of Towns Association included politicians, clergy, and certain members of the medical, engineering, as well as professing communities. With representation from both lower and upper classes, its goal was to pressure the government to implement

[15] Norman Parkinson, "The Health of Towns Association and the genesis of the Environmental Health Practitioner," *Journal of Environmental Health Research* 14, no. 1 (2014): 6.
[16] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 136.

sanitary reform by gaining significant public support.[17] Although Chadwick did not officially join the Health of Towns Association, he influenced it from behind the scenes. Thus, its propaganda for public health also promoted the sanitarian ideas outlined in Chadwick's Sanitary Report. The Health of Towns Association was extremely successful in campaigning for public health, accumulating support from across British society.[18] As a result, awareness of the need for public health measures spread rapidly in Britain and the desire for public health reform ceased to be controversial. Rather, controversy was provoked by the sanitarian solutions proposed by Chadwick that became intertwined with the early public health movement. Though Chadwick's sanitarian approach to public health became controversial, it should be noted that it was never universally hated. After all, the Sanitary Report and the Health of Towns Association were also quite successful in promoting Chadwick's vision of how sanitary reform should be conducted. However, Chadwick's plan to centralize public health would cause issues which could not be dismissed through promotion alone. Even among the working classes, opinion on Chadwick's sanitary measures would vary dramatically, from support to apathy to opposition.[19] Had Chadwick's ideas of sanitary reform not become entangled with the early public health movement, there would likely have been far less controversy and debate surrounding the implementation of public health legislation.

One final aspect to note when examining the opposition to the early public health movement is the longstanding unpopularity of Chadwick himself. The New Poor Law, of which

[17] Robert G. Paterson, "The Health of Towns Association in Great Britain 1844-1849: An Exposition of the Primary Voluntary Health Society in the Anglo-Saxon Public Health Movement," *Bulletin of the History of Medicine* 22, no. 4 (1948): 382-385.
[18] Norman Parkinson, "The Health of Towns Association and the genesis of the Environmental Health Practitioner," *Journal of Environmental Health Research* 14, no. 1 (2014): 5-7.
[19] Michael Sigsworth, and Michael Worboys, "The Public's View of Public Health in Mid-Victorian Britain," *Urban History* 21, no. 2 (1994): 250.

Chadwick was a main author, was seen by many as heavy handed and cruel. For this reason, there were many who would oppose any project in which Chadwick was involved.[20] It could be argued that the early public health movement would have faced opposition anyway simply due to Chadwick's involvement, even if he had not pushed for centralization. However, that opposition would not have become nearly as significant as it had if Chadwick had not given his opponents greater reasons to oppose him by insisting on a centralized public health authority. Though this period saw a great rise in the popularity of the early public health movement, it would also see small but growing groups of opposition start to appear.

A significant amount of debate surrounding the direction in which Chadwick was taking the early public health movement came from sections of the medical community. In the mid-Victorian period, the science behind how disease spread was not yet fully understood. One theory on the cause of disease was known as the miasmatic theory of infection. This posited that illness was the result of breathing in foul odors, referred to as miasma, which came from contaminated soil, air, and water. Chadwick used the miasmatic theory as the basis for his 1842 Sanitary Report, since it was still the most commonly accepted theory of disease among medical practitioners of the time. Chadwick's own interpretation of the miasmatic theory was that the infectious miasma could come from local sources, not just the general atmosphere and climate of an area. Such local sources could include filth, trash, and human waste, the last of which was often left to gather in cesspools due to a lack of town planning. Thus, Chadwick's solution to Britain's public health problem was to remove such local causes of miasma through cleanup, drainage, and sewers.[21]

[20] S.E. Finer, *The Life and Times of Sir Edwin Chadwick* (London: Methuen & Co., 1952), 113.
[21] Mervyn Susser, and Zena Stein, *Eras in Epidemiology: The Evolution of Ideas* (Oxford: Oxford University Press, 2009), 55.

In short, Chadwick's public health movement was a purely sanitarian one, with a significant amount of focus placed on administration and engineering as solutions rather than medical research. Chadwick had based his sanitarian ideas on the research of prominent scientists such as Thomas Southwood-Smith, Neil Arnott, and James Kay-Shuttleworth.[22] Thus, his sanitarian ideas were backed up by scientific authority. There was certainly merit to sanitarian methods, even if the miasmatic theory on which they were based would later be disproven. After all, the environmental improvements that the sanitarians proposed have mostly become standards in modern cities and likely contributed greatly to the reduction of disease in Victorian towns.[23]

However, there were those in the medical community who were convinced that the cause of disease differed from those outlined in the miasmatic theory. The contagionist theory of disease argued that infection was caused by specific living contagions, not a chemical imbalance caused by miasma. Contagionists formed the main scientific opposition to the sanitarians in the debate over public health.[24] What does this scientific debate have to do with the centralization of power? As previously discussed, Chadwick's sanitarian views had become entwined with the early public health movement. The centralization of power into a single authority of public health would mean that only one interpretation of medical science, miasmatic theory, would be considered. Perhaps this would not have been such an issue if Chadwick and his supporters had been more open to newer advances in medical science. However, the Chadwickians believed they needed to remain committed to their original dogma of miasmatic theory in order to stay

[22] Edwin Chadwick, *Report on the Sanitary Conditions of the Labouring Population of Great Britain 1842,* ed. M.W. Flinn (Edinburgh: Edinburgh University Press, 1965), 371.
[23] Christopher Hamlin, "Edwin Chadwick, "Mutton Medicine," and the Fever Question," *Bulletin of the History of Medicine* 70, no. 2 (1996): 234.
[24] George Rosen, "Disease, Debility, and Death," in *The Victorian City: Images and Realities,* eds. H.J Dyos, and Michael Wolff (2 vols, London: Routledge & Kegan Paul, 1973), 635-636.

consistent in their push for centralized public health, and were unable to adapt to advances in medical knowledge.[25] They wanted to create a sense of uniformity in practice when it came to a central sanitary authority.[26] Chadwick himself seemed completely closed off to new research: he did not see public health as a problem to be solved through medical science, but rather through engineering and administration.[27] For this reason, aside from a few prominent medical men whom Chadwick had personally picked, knowing that they would not contradict his own views,[28] the medical community had little power over how the sanitarians shaped the early public health movement.

Thus, the contagionists, who might have become allies of the early public health movement, instead contested the scientific validity of the sanitarians' miasmatic theory. Chadwick's desire to centralize public health, and thus create an authority that subscribed to only one interpretation of medical science, antagonised potential allies in the medical community. However, opposition from the medical community between 1842 and 1848 remained relatively confined. After all, Chadwick's miasmatic theory reflected the most predominantly held theory of infection at the time, and anticontagionism still prevented contagionist theory from being taken seriously in most of the medical community.[29] Nevertheless, centralization of authority came with centralization of scientific ideas in the early public health movement, alienating some who objected to a dogmatic approach to medical science.

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[25] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 141.
[26] Christopher Hamlin, *Public Health and Social Justice in the Age of Chadwick: Britain, 1800-1854* (Cambridge: Cambridge University Press, 1998), 243.
[27] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 137.
[28] Lee Jackson, *Dirty Old London: The Victorian Fight Against Filth* (New Haven: Yale University Press, 2014), 73-74.
[29] Erwin H Ackerknecht, "Anticontagionism Between 1821 and 1867: The Fielding H. Garrison Lecture," *International Journal of Epidemiology* 38, no. 1 (2009), 13-14.

Aside from the contagionists, the sanitarians also faced opposition from the small group of reformers whom had been working with Chadwick in the 1830s. As with the contagionists, Chadwick had alienated these reformers through his attempts to centralize public health based on his own sanitary ideas. However, the reasons for opposition from these reformers differed, as some believed that Chadwick's sanitary ideas had extended too far, while others believed he had left out important factors about the spread of disease. The former were a small group of London doctors with whom Chadwick had worked after the 1838 typhus outbreak. As Chadwick developed his Sanitary Report, he came to strongly disagree with these reformers. Despite following the same miasmatic theory as Chadwick, the London Doctors wanted to focus on reducing overcrowding and improving the sanitation of working class housing. While the reformers acknowledged the use of sewers and drainage, this was not the central focus of their ideas on sanitary reform.

Chadwick, on the other hand, saw the dwelling house improvements proposed by the London Doctors as insufficient to solve the issues surrounding public health in Britain. He argued that, if the dwelling house improvements were implemented without sufficient measures of sewerage also being put in place, the problem of poor sanitation in towns would actually become exacerbated. If every family in every town were to be provided with a separate dwelling, with separate amenities for removing waste, then there would be no place to deposit that waste in those areas of town that lacked drainage. Cesspools near the new dwelling houses would grow, and there would be far more water contamination, creating an even more dangerous environment. Thus, Chadwick's focus was on the construction of sewers and drainage rather than dwelling houses. This was the opposite of the London Doctors who, feeling betrayed by Chadwick's disapproval of their recommended measures, were among the first to criticise the

Sanitary Report of 1842.[30] In this way, Chadwick's sanitarian reform was more extensive than that proposed by the London Doctors.

On the other hand, some medical practitioners believed that Chadwick's sanitarian ideas did not effectively encompass the whole issue of public health. As an author of the New Poor Law, Chadwick wanted to avoid any public health solution that might incentivise illness. For this reason, Chadwick rejected the concept that poverty itself could be a cause of disease. If the condition of being a working-class individual, involving overworking and malnourishment, enabled the spread of illness, then a significant amount of relief and social reform would be needed in order to truly address Britain's public health issue. Wanting to avoid such reforms and relief, which would have likely been too philanthropic as well as expensive to pass through parliament, Chadwick dismissed the findings of the medical practitioners who advocated such measures. The sanitarian public health movement of the 1840s would thus be one that acknowledged that disease caused destitution, but did not acknowledge that destitution caused disease. Thus, many felt as though the early public health movement was not dealing with half of this disease feedback loop.[31]

One such individual was William Farr, a doctor and statistician whom Chadwick had recommended as an assistant to Registrar-General T. H. Lister in 1839. In 1844, Chadwick had expressed displeasure with Farr, lamenting that someone he had promoted would attack his work. Farr's attack was made on Chadwick's problematic conclusion that inmates with "richer" diets were more prone to disease than those who were fed less, a conclusion which justified the

[30] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 135-137.
[31] Christopher Hamlin, *Public Health and Social Justice in the Age of Chadwick: Britain, 1800-1854* (Cambridge: Cambridge University Press, 1998), 97-103.

sanitarians not dealing with malnourishment in their quest to improve public health.[32] Farr had released conclusions that starvation caused mortality as early as 1839, which was in line with Chartist goals of improving the social condition of the working class. In response, Chadwick discredited Farr's findings over the next several years, apparently attempting to maintain that hunger did not cause disease and death.[33]

Overall, then, Chadwick's rejection of feedback from parts of the medical community was caused by his goals of centralization. The relatively little medical writing in the 1842 Sanitary Report served simply to provide scientific authority for Chadwick's attempt to reorder society.[34] Chadwick never really saw medical science as useful in a public health movement beyond the identification of the problem.[35] He simply used prominent scientists who did not contradict his ideas as a means to gain the scientific authority necessary to put the public health movement into the hands of a centralized power capable of carrying out sanitary reform without getting stuck in the details. What use did he have for medical science that contradicted his interpretation of how the public health movement should proceed? In seeking to centralize power, Chadwickians became stuck in the dogma of miasmatic theory, which would prove a problem as advances in medical science took place.

Centralization also provoked controversy among engineers in the early public health movement. Chadwick had a reputation for being abrasive and uncompromising.[36] This attitude put him in conflict with some of the engineers who were working on designs for sewers, a main

[32] R. A. Lewis, *Edwin Chadwick and the Public Health Movement 1832-1854* (London: Longmans, Green and Co, 1952), 32-33.
[33] Christopher Hamlin, "Edwin Chadwick, "Mutton Medicine," and the Fever Question," *Bulletin of the History of Medicine* 70, no. 2 (1996): 243-244.
[34] Christopher Hamlin, *Public Health and Social Justice in the Age of Chadwick: Britain, 1800-1854* (Cambridge: Cambridge University Press, 1998), 156-157.
[35] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 137.
[36] Lee Jackson, *Dirty Old London: The Victorian Fight Against Filth* (New Haven: Yale University Press, 2014), 71.

focus of the early public health movement. In the Sanitary Report of 1842, Chadwick argued that sanitary improvements were, "operations from which aid must be sought from the science of the civil engineer, not from the physician."[37] However, Chadwick would later become as strict about the designs of engineers as he was about the theories of the medical community. Prior to this period, waste disposal in large cities like London was done via cesspools, enclosed pits in which refuse was deposited to be later taken and carted off by labourers known as nightmen (as by law they could only move waste after midnight). As population density increased, these cesspools could not keep up with the increased levels of waste and became dangerous to public health. Excessive buildup of filth created unsanitary conditions, which promoted the spread of disease and created a very dangerous job for the nightmen, who could be asphyxiated by noxious fumes as they worked. Furthermore, the cleaning of cesspools was an expensive process and transportation of waste by cart could lead to some messy accidents. As a result of all these factors, Chadwick advocated the replacement of cesspools by sewers in his 1842 Sanitary Report.[38]

The creation of sewer systems would be the primary role of engineers in the early public health movement, offering them significant employment opportunities. There were, however, already sewers in place in many parts of London during this period. Up until 1815, the sewer systems of London were used solely as a means to carry off surface water. Following 1815, it became permissible to discharge a dwelling's waste using the sewer system, though the cesspool remained the city's predominant refuse removal method. Prior to 1847, there was no singular sewer design that was used, as there was no central authority to enforce such a standard. Rather,

[37] Edwin Chadwick, *Report on the Sanitary Conditions of the Labouring Population of Great Britain,* ed. M.W. Flinn (Edinburgh: Edinburgh University Press, 1965), 396.
[38] Michelle Allan, *Cleansing the City: Sanitary Geographies in Victorian London* (Ohio: Ohio University Press, 2008), 24-27.

there were eight Commissions of Sewers in London which operated independently in their own districts. Each Commission constructed sewers with sizes and designs of their own choosing, creating inconsistent points of connection between districts. In 1847 the early public health movement's push for sanitation brought about centralization by merging the eight commissions into one, the Metropolitan Commission of Sewers. The city's sewer system began using a small pipe-based design rather than traditional large brick sewers. Cesspools were abolished, and use of this new sewer system became compulsory as all house drainage was diverted into it.[39]

Centralization would lead to uniformity in sewer design and connection. With this uniformity came the question of which design was best. Southwood Smith had recommended an expansion of large flat-brick sewers, from which scavengers would efficiently remove waste. However, Chadwick objected to this, as he had developed an interest in the designs put forth by a London engineer named John Roe.[40] Roe had recently developed a new type of sewer with a radical new concept of waste removal through fast-flowing pressurized water. This fit in very well with Chadwick's sanitary objective of waste removal. Roe's sewers were small, sturdy, and able to move waste quickly out of the city without the need of nightmen. These egg-shaped sewers became the preferred design for interconnected waste removal.[41] At this point in time, Chadwick's relationship with engineers was still very good. After all, he was providing jobs, consulted them extensively in the Health of Towns Association's reports on sewers, and Roe's design was quite popular.[42]

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[39] Joseph William Bazalgette, *On the Main Drainage of London: and the interception of the sewage from the River Thames* (London: W. Clowes and Sons, 1865), 5-6.
[40] Anthony Brundage, *England's "Prussian Minister": Edwin Chadwick and the Politics of Government Growth, 1832-1854* (Pennsylvania: Pennsylvania State University Press, 1988), 81.
[41] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 139.
[42] Christopher Hamlin, "Edwin Chadwick and the Engineers, 1842-1854: Systems and Antisystems in the Pipe-and-Brick Sewers War," *Technology and Culture* 33, no. 4 (1992): 685-687.

However, as centralization of the early public health movement led to the establishment of powerful sanitary authorities, engineers began to believe that Chadwick meant to dominate and control the engineering profession. Before the General Board of Health, such an authority manifested in the Metropolitan Sanitary Commission of 1847. This commission was dominated by Chadwick, who now took on a far more critical tone towards engineers. In a report, the Metropolitan Sanitary Commission concluded that engineers often ignored the optimal approach to sewerage because they were paid by a percentage of projected costs. Thus, it was not in the engineers' best interest to follow the most economic and efficient methods of sewer construction. Furthermore, the ability of engineers who were not specialised in sewer construction to build high quality sewers was called into question.[43] Chadwick pointed out the corruption and incompetence amongst engineers, (which truthfully was often the case) outlining why he would become far less trusting of the engineering profession as the early public health movement progressed.[44] Since they could not be trusted to operate efficiently, the engineers would have to be controlled.

Unlike in his political and medical theories, Chadwick was not particularly dogmatic in his views on sanitary engineering.[45] An engineer known as John Phillips was quickly becoming Chadwick's favoured sewer designer over Roe, as both men seemed to share a similar mindset of denouncing opposition and seeing criticism as having corrupt ulterior motives. Unlike Roe, Phillips' sewer design was criticised by engineers, as it seemed to be based on ideal conditions rather than on the actual engineering conditions of towns. Chadwick would, in fact, have to compromise a great deal when it came to Phillips' design in order to have a theoretically

[43] Christopher Hamlin, "Edwin Chadwick and the Engineers, 1842-1854: Systems and Antisystems in the Pipe-and-Brick Sewers War," *Technology and Culture* 33, no. 4 (1992): 688-689.
[44] Ibid., 680.
[45] Ibid., 683.

functioning model.[46] Thus, between accusations of corruption and a shift towards inferior designs, Chadwick had strained the relationship between himself and engineers by 1848. Again, centralization of the public health movement meant that only the ideas of the central sanitary authorities, in this case Chadwick, would be accepted, while any criticism was met with fierce opposition. Chadwick's sewer design would be used whether the engineers liked it or not. These fierce debates over engineering would come to be used as ammunition by those with personal interests in opposing the early public health movement.[47]

Others who opposed centralization in the early public health movement were businesses with vested economic interests. Private water companies and urban landlords both felt they had much to lose if Chadwick's plans for public health reform went forward. These businesses questioned whether central authority over sanitation would truly work more efficiently than uninhibited private enterprise.[48] As for the water companies, which competed to provide water in towns, Chadwick initially wished to make use of their capitalist spirit. He figured that private businesses with a vested interest in success would be more efficient and cost effective in providing sanitation than an administrator could be. However, this support of private enterprise soon faded. In order for sanitary reform to function, a large and constant supply of water was needed in order to move waste through sewers, clean town structures, and provide for baths. Some public control over the private water companies was necessary in order to ensure this constant supply. Following such recommendations from the Health of Towns Association, many water companies feared that water supplies would come under public control and began claiming them. Unable to prevent this seizure of water by appealing to government, Chadwick began a

[46] Christopher Hamlin, "Edwin Chadwick and the Engineers, 1842-1854: Systems and Antisystems in the Pipe-and-Brick Sewers War," *Technology and Culture* 33, no. 4 (1992): 689-691.
[47] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 143.
[48] Ibid., 142.

private war against the water companies in 1845 in an attempt to keep them in line. This resulted in the 1847 Waterworks Clauses Act, which limited water company profits, penalized water companies that did not provide a legitimate demand for supply, forced water companies to provide for public services, and required sufficiently clean water at high pressure.[49] Central authority over public health had burdened the water companies with restrictions.

Meanwhile, the urban landlords had been able to get rich quickly by rapidly constructing dwellings without building regulations. They were able to generate large profits by renting these cheaply constructed dwellings to tenants, despite the fact that they had insufficient drainage and sanitation.[50] These slum owners opposed public health reform in parliament, convincing other middle class members who had not seen the terrible conditions of the slums for themselves to help them.[51] Groups of private economic interests such as these chaffed at regulation, desiring above all freedom of enterprise and competition in order to maximize profits. Centralization of public health threatened this, as it would bring about a high degree of public control over private enterprises, higher standards, and a reduction of competition. Disliking the prospect of government sticking its hand in the marketplace, businesses became some of the early public health movement's most powerful enemies in parliament due to their economic influence.[52]

Centralization in the early public health movement also faced significant opposition from local government. Prior to the early public health movement, sanitary matters were the responsibility of various local authorities. These authorities were so numerous that their

[49] R. A. Lewis, *Edwin Chadwick and the Public Health Movement 1832-1854* (London: Longmans, Green and Co, 1952), 104-105, 117, 131-138.
[50] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 135.
[51] Royston Lambert, *Sir John Simon 1816-1904 and English Social Administration* (London: MacGibbon & Kee, 1963), 87-88.
[52] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 144.

jurisdictions and responsibilities overlapped, often leading to administrative confusion. Furthermore, local authorities were often corrupt and inefficient in their duties. Chadwick realised that the organized and extensive sanitary reforms that he envisioned would be impossible to effectively implement if left to these many incompetent local boards. Thus, Chadwick sought to abolish these various local boards and replace them with a smaller number of more effective authorities with greater centralized power. However, the pre-existing local boards would not let go of their power so easily and fought ferociously against the implementation of public health reform.

Chadwick's stance on this issue was to be expected, as he was known to have animosity towards local boards. Chadwick especially hated boards with positions filled by democratic election, as he felt that elected members often did not have the necessary experience to do an effective job. In his usual utilitarian way of thinking, Chadwick preferred appointed boards, on which only highly experienced professionals would serve. This elitist attitude made Chadwick very unpopular in London, where local authorities were often radically independent-minded. Chadwick's attempts to centralize greater amounts of power in permanent officials, while abolishing most of the metropolis' local authorities, caused dangerous opposition in London.

Inclusion of London in centralized public health reform proved a particularly difficult matter.[53] Significant issues began to arise in the Metropolitan Commission of Sewers. As discussed previously, the Metropolitan Commission of Sewers was one example of ineffective local boards being consolidated into a single centralized authority. Its formation in 1847 was easily achieved, as the old sewer commissions had already developed a bad reputation. However,

[53] Anthony Brundage, *England's "Prussian Minister": Edwin Chadwick and the Politics of Government Growth, 1832-1854* (Pennsylvania: Pennsylvania State University Press, 1988), 121-123.

its operation would prove quite problematic. London's vestries were highly critical of Chadwick's centralization, as they saw it as a threat to their continued operation. Viscount Morpeth, one of Chadwick's key allies, had appointed John Leslie, a vestryman from one of the old Westminster Commission of Sewers, in the hopes that his inclusion in the Metropolitan Commission of Sewers would reduce the tension between sanitarians and London's local authorities.[54] Of the twenty three members of the Metropolitan Commission of Sewers, most were sanitarians who supported Chadwick, while Leslie and the three other vestry representatives appointed with him became a small opposition party of sorts.

Chadwick, who saw the vestrymen as unqualified and bothersome, decided to eliminate this opposition. As the Metropolitan Commission of Sewers was to be reconstituted in 1848, he convinced Morpeth that it should remain an appointed board rather than an elective one, and that Leslie should not be reappointed. This proved a serious mistake. Making the Metropolitan Commission of Sewers an appointed board, which barred Leslie or any other London interest from joining, gave an anti-democratic impression that aggravated metropolitan radicals. Chadwick's further attempts to suppress Leslie by keeping him off other committees only made Chadwick look more like a tyrant, turning all of the London interests against him. Among those angered by this was John Walter III of *The Times* newspaper, creating yet another dangerous and highly visible critic.[55] To local authorities, centralization of public health meant a loss of power to a tyranny that would not represent their interests. Fear of paternalistic government was so great that some even objected to centralization of sewers on the grounds that it would take waste

[54] Lee Jackson, *Dirty Old London: The Victorian Fight Against Filth* (New Haven: Yale University Press, 2014), 82.
[55] Anthony Brundage, *England's "Prussian Minister": Edwin Chadwick and the Politics of Government Growth, 1832-1854* (Pennsylvania: Pennsylvania State University Press, 1988), 124-125.

removal out of the hands of locals and put it in those of an overarching authority.[56] The fear of centralized authority thus created much opposition to the early public health movement, especially in the highly independent London metropolis.

1848-1854: The General Board of Health

In his efforts to centralize the early public health movement, Chadwick had made enemies of parts of the medical community, engineers, private businesses, and local governments. However, by 1848 the public health movement had become extraordinarily popular despite opposition from these groups. Given its highly effective publicity campaign, the Health of Towns Association had become the most powerful pressure group in Britain after the Anti-Corn Law League. The push for public health legislature was becoming more and more difficult to ignore. In three reports issued by the Metropolitan Sanitary Commission between 1847 and 1848, it seemed as though Chadwick's colleagues had also been swayed in favour of his sanitary reform plan.[57] By 1848, the myriad of factors which had delayed public health legislature had finally been resolved. For example, such legislation could not be put in place until the Commission on the Health of Towns, which started in 1843, finished its assessment of the Sanitary Report in 1845. By then the Corn Law crisis, the resulting split in the Tory party, and the Irish Potato Famine overshadowed the issue of public health. While Chadwick had been able to gain significant support for sanitary reform during this delay, he had also provoked fierce opposition from the four aforementioned groups. Businesses and local governments with a voice

[56] Michelle Allan, *Cleansing the City: Sanitary Geographies in Victorian London* (Ohio: Ohio University Press, 2008), 24-25.
[57] Anthony Brundage, *England's "Prussian Minister": Edwin Chadwick and the Politics of Government Growth, 1832-1854* (Pennsylvania: Pennsylvania State University Press, 1988), 120-122.

in parliament would use the confusion surrounding the sanitarians' medical and engineering conflicts to their advantage in disputing Chadwick's centralized public health plans.[58]

Thus, when a Public Health Bill was finally put forward in 1848 based on the Sanitary Report, it did not pass as smoothly as Chadwick would have hoped. That bill, proposed by Viscount Morpeth, envisioned a central authority that would come to be known as the General Board of Health. This central authority was to be a board that consisted of five members and would be overseen by government. The central board would oversee local boards that could be set up if requested by a petition of one-fiftieth of the locality's inhabitants. In company towns, local boards would be formed from members of the corporation as well as some elected members if applicable. In other towns, representatives of their local board would be chosen by election. When a petition of one-fiftieth of a locality was submitted, a report by an inspector from the central board would follow. If this report agreed that a local board was necessary, then the jurisdiction would be defined, the appropriate number of board members would be determined, and a local board could then be created. The central board had a great deal of power over the local boards. While the local boards could take some actions on their own, they were also compelled to appoint a surveyor, appoint an inspector of nuisances, and undertake the various sanitary improvements recommended in the Sanitary Report. Permission from the central board was required to dismiss surveyors, and engineering projects could not be undertaken without first getting approval from the central board. If an engineering project was given approval, it became mandatory and could no longer be cancelled. Finally, the central board had a significant degree of control over the local boards' finances. For the time being, London was to be excluded from this bill until the Metropolitan Sanitary Commission concluded its report. The enemies of

[58] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 143.

centralization quickly raised their voices in opposition, decrying what they saw as the return of undesired government patronage and an attempt to end local government. Others were simply concerned that London would not yet be included.[59]

Such voices would be heard in parliament, where the bill was being debated. In 1847, discussion of public health measures in the House of Commons had been largely uncontroversial. It was agreed that: public health measures were necessary, as they outweighed self-interest; it was a shame that such measures had been delayed for so long; and the metropolis should be included in a public health scheme.[60] However, when the details of the Public Health bill were placed before it in 1848, the House of Commons became divided over the issue. Although public health measures were still considered necessary, some members of parliament expressed concern over the centralization in the proposed bill. One, "objected most decidedly to the power which was proposed to be given to a central board in London to control the affairs of the different localities affected by the Bill."[61] Fears over the effect of centralization on private economic interests, as well as the difficulties of including London, were also expressed.[62] As a result, the coercive powers of the central board were gutted as the Commons amended the bill. For a local board to be formed, a petition with one-tenth of inhabitants, much more than one-fiftieth, had to be submitted. Furthermore, the local boards would no longer be required to propose sanitary schemes, nor were they compelled to carry through with such schemes after they were sanctioned by the central board. The central board would lose its control over the finances of the local boards, as loans could now be raised without its permission.[63]

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[59] S. E. Finer, *The Life and Times of Sir Edwin Chadwick* (London: Methuen & Co., 1952), 319-320.
[60] UK Parliament House of Commons Debate, *Health of Towns,* 30 March, 1847, Volume 91.
[61] UK Parliament House of Commons Debate, *Public Health Bill-Adjourned Debate,* 8 May, 1848, Volume 98.
[62] UK Parliament House of Commons Debate, *Public Health Bill,* 18 May, 1848, Volume 98.
[63] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 144.

However, the House of Lords had a far more favourable view of the Public Health Bill. There was no argument over the issue of centralization among the Lords, and if anything, they expressed the desire to give even more power to the central board. The only real concern expressed by the Lords was the exclusion of London; yet this was far from a complaint, as they felt that London should be included as soon as possible.[64] The Lords expressed disappointment at the Commons' gutting of the central board's power. The Earl of Ellenborough, "objected to the amendments of the Commons, as they might lead to jobbing in the local boards" (jobbing referring to corrupt board members, who would use their positions as a means to make money rather than to improve their communities). Although they wished to restore the bill to its original state, the House of Lords realised that they needed to make concessions in order for it to pass the Commons.[65] Thus, while they could not restore all of the central board's power, the Lords restored the central board's control over the local boards' loans. The central board was also given the power to arbitrarily create local boards in areas with a mortality rate of twenty-three per thousand (the national average was twenty-one per thousand) without the need of a petition. Thus, the Public Health Act came into being in 1848 just as a new cholera outbreak began, with the General Board of Health as a new central authority that had been weakened but not yet defanged by opponents of centralization. Chadwick, Morpeth, and Lord Ashley chaired the new General Board, which now consisted of only three members. Southwood Smith acted as chief medical officer, though he remained compliant to the wishes of the three board members.[66] The General Board was to be active for five years, after which it would need to be renewed.[67] The near loss of the General Board's centralized power demonstrates the extent to which

[64] UK Parliament House of Lords Debate, *Public Health Bill,* 30 June, 1848, Volume 99.
[65] UK Parliament House of Lords Debate, *Public Health Bill,* 15 August, 1848, Volume 101.
[66] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 145.
[67] S. E. Finer, *The Life and Times of Sir Edwin Chadwick* (London: Methuen & Co., 1952), 326.

centralization had created enemies for the early public health movement. Medical men and engineers saw centralization as a means to repress new ideas and restrict practices. Private companies and local government saw centralization as a threat to their profits and power. Though they had only succeeded in wounding the Public Health Act as passed in 1848, these groups would continue to cause difficulties for the General Board of Health in the following years.

Centralization of the public health movement meant that only the General Board's interpretation of disease would be used to determine the best course of action in implementing sanitary reform. The miasmatic theory to which the General Board was dogmatically committed received even greater scrutiny after the Public Health Act passed. The increasing plausibility of alternative theories and opposition from medical professionals called into question the legitimacy of the General Board's central authority over official scientific opinion. Soon after the General Board's inception, opposition began to grow. At the end of 1848, the General Board created a Quarantine Report that dismissed the effectiveness of a quarantine system in preventing the spread of disease. The report argued that epidemics were not caused by contagion, but rather by a miasma created by specific atmospheric conditions. It placed a variety of diseases, including typhus, plague, scarlatina, influenza, yellow fever, as well as cholera, in the same category of fever, and it rejected the idea that they each had specific methods of infection. The report acknowledged that disease could be spread through human contact, but not in the way contagionists imagined. Rather, it was asserted that human exhalations and excretions could build up to create a miasma that caused illness through exposure. Though a miasma produced from the exhalations of sick people was said to be more dangerous, it was stated that a build-up of such exhalations from healthy people could also cause disease. Thus, quarantine was not the

answer. Rather, better ventilation would prevent the buildup of such a miasma because fresh air could purify it.[68]

The Quarantine Report revealed the General Board's dogmatic approach to science. Medical authority had been centralized in the General Board, yet it would not adapt to new medical developments, so medical professionals began to oppose it. Whereas contagionism had been rejected by most of the medical community earlier in the decade, anticontagionism had become far less prominent by the time the Quarantine Report was released. Many now believed that different diseases could be spread in different ways, some through miasma and some through contagion.[69] Many medical professionals saw the outright rejection of professional opinion as an insult and a discredit to their profession's usefulness to society. In order to defend themselves, medical professionals replied to the Quarantine Report by releasing their own oppositional reports. In these reports, they argued that all fever diseases were specific rather than similar, that the epidemic influence of atmosphere was overemphasized, and that the General Board had misrepresented the medical community's current views on contagion. Amidst this criticism, the General Board released a Report on Cholera in 1850 as well as a second Quarantine Report in 1852. While these reports were less antagonistic towards the medical profession, they still maintained the same miasmatic views to which the General Board dogmatically subscribed. Furthermore, while the reports did not insult medical professionals, it also did nothing to appease them. Thus, hostility towards the General Board from the medical community continued.[70] In this way, centralization in the General Board of Health caused

[68] Margaret Pelling, *Cholera, Fever and English Medicine 1825-1865* (Oxford: Oxford University Press, 1978), 63-67.
[69] Ibid.
[70] Ibid., 74-80.

problems for the public health movement. As only the outdated ideas of the central authority were accepted, the scientific authority of the General Board was called into question.

As time went on, the General Board's centralized authority was further challenged as its scientific basis faced more high-profile competition. In 1849 physician John Snow published "On the Mode of Communication of Cholera". His findings contradicted the official medical theory of the General Board and would play a large role in the decline of anticontagionism in the 1850s and 1860s.[71] He concluded that cholera was transmitted through the consumption of contaminated substances rather than through the atmosphere, a conclusion in line with contagion theory.[72] Based on this, Snow concluded that cholera was a disorder of the digestive system instead of a disorder of the blood, as was commonly thought.[73] Although Snow's theory was not yet broadly accepted by the medical community, the nature of the criticisms he received demonstrate a shifting in the understanding of disease. Critics called into question Snow's claim that cholera was an intestinal disease, as well as his claim that cholera infection was only caused by consuming contaminated water, asserting that it could also be caused by air. This demonstrates that miasmatic theory was still being used, but also that was not the only cause of infection being considered. Furthermore, the specificity of different diseases was being examined which contradicted the Quarantine Report's claim that all fevers were similar. Snow continued working to strengthen his argument on the communication of cholera while gaining professional

[71] Erwin H Ackerknecht, "Anticontagionism Between 1821 and 1867: The Fielding H. Garrison Lecture." *International Journal of Epidemiology* 38, no. 1 (2009): 14.
[72] John Snow, "On the Mode of Communication of Cholera" (London: John Churchill, 1849), 29-30.
[73] Ball, Laura. "Cholera and the Pump on Broad Street: The Life and Legacy of John Snow." *The History Teacher* 43, no. 1 (2009): 107.

success for his work with chloroform, despite criticism from the medical community and the General Board of Health.[74]

Even as Snow's theory became more popular, the General Board only considered consumption of contaminated water to be a predisposing factor, and continued to insist that miasma was the immediate cause of disease. Snow's rise to prominence led him to administer chloroform to Queen Victoria in 1853 for the delivery of her son, Prince Leopold.[75] Scientists with novel theories of disease had thus begun to earn prominence, creating competition for Southwood Smith and the other prominent scientists working with the General Board. Centralization of the early public health movement had created a dogmatic approach to science and restricted what could be considered official medical ideas. This led a large portion of the medical community to turn against the General Board, calling its scientific authority into question.

Similarly, the centralized authority of the General Board was being called into question over its approaches to engineering. In 1852 the Institution of Civil Engineers, which had remained quiet about the General Board of Health's sewer scheme up until this point, began expressing their discontent. There were two reasons why civil engineers spoke up at this point. Firstly, the institution was responding to a campaign of harassment that the General Board had been perpetrating towards the engineering profession. In order to assert its centralized control over sewer planning, the General Board's health inspectors rejected any plans that did not follow Chadwick's designs. The plans of leading engineers were being dismissed, hurting their

[74] Peter Vinten-Johansen, *Cholera, Chloroform, and the Science of Medicine: a Life of John Snow* (Oxford: Oxford University Press, 2003), 231-234, 340-341.
[75] Stephen Halliday, *The Great Filth: The War Against Disease in Victorian England* (Gloucestershire: Sutton Publishing, 2007), 76-77.

businesses and supplanting their professional authority. Some even alleged that the General Board stole their plans after dismissing them. Local boards were told that it was illegal under the Nuisances Removal Act to build traditional sewer systems. The General Board even used propaganda against the businesses of civil engineers, advertising to towns that it could build sewer systems forty percent cheaper. Attacks such as these provoked civil engineers into action, as the General Board's aggressive centralization of sewer design threatened their profession. Secondly, the General Board of Health had completed enough sewer construction projects in London and other cities by 1852 for an assessment to be made of their practical viability. There was plenty to criticise. Pipes blocked very easily due to the narrow parameters that Chadwick insisted upon to facilitate increased water pressure. The narrow pipes also burst often, and could be very difficult to replace, especially in a bustling town. Excessive rainfall could overload the sewer system. In Croydon, 1852 saw numerous reports of pipes blocking or breaking, followed by outbreaks of fever. The General Board of Health blamed this on improper implementation by Thomas Cox, Croydon's surveyor. Thomas Page, a Board of Trade engineer, noted that the General Board was trying to deflect responsibility, despite the fact that responsibility rested solely on the General Board as the central authority of public health.[76]

The engineers pointed out two flaws in design that were causing these failures. The first rested solely on Chadwick's idealistic design philosophy, which functioned well on paper but was too finely tuned to function properly in the real world, as it left no room for error. Flaws in the manufactured pipes, inefficient town infrastructure, an excess of rainy weather, or things being flushed into the sewers that were not supposed to be, could easily throw a wrench in the

[76] Christopher Hamlin, "Edwin Chadwick and the Engineers, 1842-1854: Systems and Antisystems in the Pipe-and-Brick Sewers War," *Technology and Culture* 33, no. 4 (1992): 698-704.

works. The second flaw was the focus on a centralized design. Unlike Chadwick, who took a highly systematic approach to constructing sewers, engineers took a decentralized anti-systematic approach. As a centralized authority, Chadwick did not look at individual cases but rather applied the same generalized system to every town he could. In contrast, the engineers examined individual cases and looked for the best way to implement sewers according to locality rather than an overarching plan, recognizing that variation was necessary when dealing with variable individual cases.[77] In response to attacks on their profession, civil engineers fought to show that a more local and specific approach to sewer design was superior to that of an overarching, dogmatic central authority. Engineers would play a prominent role in the downfall of the early public health movement, as they worked with politicians to block improvements and questioned the effectiveness of the General Board of Health.[78]

Private economic interests also continued to block the General Board of Health's ability to make improvements in their resistance against the regulations that came with centralization. In 1850, Chadwick published a Report on the Supply of Water to the Metropolis, in which he argued that the nine remaining London water companies should be consolidated into a single water supply and drainage service. Chadwick maintained that there was no reason the principle of centralization that defined the Public Health Act should not also be applied to London. After all, it was apparent to even a follower of miasmatic theory, who did not believe that consuming contaminated water caused disease, that the water supply of most Londoners was unacceptably foul.[79] The General Board of Health echoed Chadwick's report in 1851, asserting that the water

[77] Christopher Hamlin, "Edwin Chadwick and the Engineers, 1842-1854: Systems and Antisystems in the Pipe-and-Brick Sewers War," *Technology and Culture* 33, no. 4 (1992): 682, 702-703, 706.
[78] Ibid., 681.
[79] R. A. Lewis, *Edwin Chadwick and the Public Health Movement 1832-1854* (London: Longmans, Green and Co, 1952), 258.

companies should be taken over and put in the hands of a central government agency. The General Board concluded that the companies had failed London during the recent cholera epidemic, as the water they had provided was too poor in quality and low in quantity for proper sanitation. Furthermore, the stinking water that had been distributed contributed to the miasma, increasing mortality.[80] Unfortunately, recommendations to buy out the water companies were never acted upon, and further attempts to secure a good supply of water for London resulted in failure. A Metropolitan Water Act had been introduced in 1852 to apply some degree of regulation to the water companies, requiring that they filter their water, for instance. However, the water companies did not always comply with such regulations. London would not be provided with a constant supply of clean water for many years to come, despite the General Board of Health's efforts. Such efforts to apply centralized control over London's water companies failed because the water companies, along with other vested economic interests, had strong roots in government and the press. Shareholders for these companies would only move against them amidst great public pressure and with insufficient severity when forced to do so.[81]

This was also true for burial companies. The Nuisances Act of 1849 gave the General Board of Health the ability to enquire into the state of metropolitan graveyards which, when poorly managed or overcrowded, produced miasma and disease in towns. Seeking to resolve this issue, Chadwick proposed that burials should become a public service centralized on a small board of appointed commissioners. These commissioners would regulate new national cemeteries, which would replace parish churchyards, joint stock cemeteries, and private burial grounds. Parishes would be paid in compensation for this loss of burial fees, joint stock

[80] John Broich, *London: Water and the Making of the Modern City* (Pittsburgh: University of Pittsburgh Press, 2013), 42.
[81] R. A. Lewis, *Edwin Chadwick and the Public Health Movement 1832-1854* (London: Longmans, Green and Co, 1952), 258.

cemeteries would be bought out, and national cemeteries would have places for both Anglicans and Dissenters. The fact that these reforms would mean the loss of eight cemetery companies and three thousand undertaking jobs in the metropolis created much opposition among metropolitan members of parliament. Despite this, Chadwick's scheme came out of parliament as the Metropolitan Interments Act in 1850, the only significant change being that the General Board of Health would be put in charge of administering it rather than a new commission.[82]

Unfortunately, the now overstretched General Board could not bring this scheme to fruition due to blatant opposition from the Treasury, which prevented them from purchasing cemeteries. Both those in the Treasury as well as the General Board's new president, Lord Seymour (who had replaced Viscount Morpeth), shared a common belief that private enterprise and unrestricted capitalism created the most efficient results. Due to their distaste for Chadwick's use of patronage and centralization over business, they stalled the Metropolitan Internments Act until it died.[83] On top of this failure, the General Board had established itself as an enemy of burial companies in much the same way as it had with the water companies. Economic interests, including water companies, burial companies, and slum landlords, would use their established connections in the government to resist the Public Health Act.[84] To such private interests, centralization of the early public health movement meant greater restriction, loss of profits, or even loss of their entire business. As a result, they became powerful enemies of the General Board, blocking its ability to put out effective sanitary solutions.

[82] R. A. Lewis, *Edwin Chadwick and the Public Health Movement 1832-1854* (London: Longmans, Green and Co, 1952), 238-258.
[83] Ibid.
[84] Ibid., 330.

Local government also continued to be a strong opponent of the centralizing efforts of the General Board of Health. As previously noted, the General Board could only establish local boards in areas that submitted a petition of one-tenths of local inhabitants or in areas with a high mortality rate. While these local boards did have a degree of autonomy, they functioned more as a body through which the General Board could exercise its central authority. The General Board retained coercive power over the local boards' finances and could appoint a surveyor to local boards as a permanent official. The General Board's success thus depended on its ability to convince localities to petition for a local board, at which point central control over the area's sanitation could be exercised. While the cholera epidemic of 1848 to 1849 had diverted the attention of the General Board away from this goal, it had also demonstrated the importance of implementing sanitary measures. It also contrasted traditional local officials, who were corrupt and slow to act, with the General Board, which worked tirelessly for the year the epidemic lasted by using emergency powers to enforce rapid sanitation.[85] Thus, petitions for local boards began coming in quickly by 1849. Local boards began sending reports back to the General Board with recommendations for public health improvements based on Chadwick's sanitarian ideas. This included information on drainage, ventilation, sewer structure, possible sources of miasma, and cost-benefit analysis for new sanitary infrastructure.[86] As its relationship with the local boards was vital to its success, the General Board tried its best to win over local opinion. Preliminary inspectors from the General Board were given instructions to persuade locals of the benefits that sanitation would bring, such as better community health and a reduction of taxes from more efficient systems. The General Board also tried to maintain a sense that its central power would

[85] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 144-146.
[86] William Lee, *Report to the General Board of Health, on a Preliminary Inquiry into the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Borough of Godmanchester, in the County of Huntington* (London: W. Clowes & Sons, 1849).

not be intrusive on the localities, by only performing a minimal amount of unrequested inspections.[87] However, the relationship between the General Board and localities would be greatly harmed by dealings with London's ever problematic local authorities.

The sanitary conditions of London were dismal. In 1848 London parishes lacked proper sewerage, drainage, cleanliness, and public amenities. The metropolis seemed to represent everything the Sanitary Report had warned against in 1842, yet many local authorities remained incapable or unwilling to make necessary improvements.[88] It is thus unsurprising that gaining control over London's sanitation was a top priority for the General Board of Health. London had been excluded from the Public Health Act in 1848 on the understanding that additional surveys and inquiries into the city were to be conducted. The Metropolitan Commission of Sewers was to perform these inquiries, after which London would be included in the Public Health Act in a separate metropolitan measure. However, the vestry members who had been appointed to the Chadwickian-dominated Metropolitan Commission of Sewers continued their obstruction efforts. They also ensured that the commission's internal struggle came to public attention. *The Times* newspaper weighed in, accusing the General Board of exorbitance and imperialism for controlling the commission through appointments. Amidst public disgrace, the Metropolitan Commission of Sewers was dismissed in 1849 and was replaced by a new commission controlled by Britain's Engineering Institute. As previously discussed, Chadwick's relationship with engineers had deteriorated, so the General Board and the Engineering Institute were natural enemies in the struggle for control of London. On top of this, radical metropolitan politicians opposed the General Board's movements to take London, wanting independent local

[87] *Public Health Act Report to the General Board of Health on Darlington 1850,* ed. H. John Smith (Yorkshire: J.T. Stokeld & Sons Limited, 1967), 2.
[88] Hector Gavin, *Sanitary Ramblings: Sketches and Illustrations of Bethnal Green, a Type of the Condition of the Metropolis and Other Large Towns* (London: John Churchill, 1848), 114-115.

government. The Engineering Institute and the metropolitan radicals also fought each other for control of local power. In this three way struggle for control of London, the General Board attempted to use the powers they had acquired over water supply and burials to wrest control over other aspects of the city's sanitation. This strategy was denounced by London interests in parliament, who saw the General Board's attempt to centralize power as tyrannical. Although the General Board had managed to make some improvements in the metropolis, by the end of 1852 opposition from the Engineering Institute and metropolitan radicals crushed its attempts to control London's sanitation. The General Board had been so distracted by the cholera epidemic and its struggle to control London that it had not had time to focus on its other duties. Local boards had not yet been set up in many areas that had applied for them, while many areas with local boards had not yet established sanitation measures. It was also becoming more difficult to get towns to apply for local boards, as the many conflicts surrounding centralization had discouraged the formation of petitions. With eighteen months left until the General Board was to be reviewed for renewal, there was little time for the improvement of its public image and effectiveness. Its existence hanging in the balance, the General Board tried its best to regain its good faith until 1854.[89] Struggles between central authority and local government had yet again been highly detrimental to the early public health movement.

After 1854: Conclusion

The General Board of Health's attempt to improve its public appearance was ultimately in vain. It failed to meet expectations for many localities in the eighteen months that it had to

[89] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 147-149.

focus on them.[90] Amidst these various failings, it came time to review the General Board for renewal. In the House of Commons, the General Board was attacked for its conduct. While there was still agreement that public health was an important issue, the forcefulness of the centralization that Edwin Chadwick had pursued was heavily criticised. Lord Seymour, speaking in the Commons, said, "as to the necessity of a Public Health Board, no one denied it; the point to be clearly established was the value of a Board which almost entirely depended on the manner in which it was administered," and that "the Board of Health had exercised [its great powers] to a very large extent, without either judgment, or caution, or forbearance." By July Chadwick had already submitted his resignation, as calls for his removal were made.[91] The House of Commons decided that the General Board should be reconstituted rather than discontinued. New board members who were more pleasing to the Commons were to be appointed, and the General Board's power over local boards was to be significantly reduced.[92] This, it was hoped, would allow for public health reform to continue while reducing the problem of centralization.

The House of Lords was far less critical of the General Board's conduct. Yet again, the Lords were not concerned about centralization and were mostly in favour of the direction in which Chadwick had brought the public health movement. The Bishop of London argued, "If the Board of Health had not succeeded in carrying into effect the great sanitary reforms which were anticipated by the public, their not having done so was no fault of the Board of Health, but of the Government, who had neglected to assist them in the way that ought to have been done. If the Board of Health had not been thwarted by the Government, or rather by those officers of the Government whose duty it was to watch over the Board of Health, and, if necessary, to control,

[90] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 149.
[91] UK Parliament House of Commons Debate. *Public Health Act Amendment Bill,* 31 July, 1854, Volume 135.
[92] UK Parliament House of Commons Debate. *Public Health Bill,* 4 August, 1854, Volume 135.

but more generally to encourage their proceedings, the public would by this time have had good water, and that at a price so trivial as scarcely to be worth consideration." [93] However, they did not prevent Commons from reconstituting and reducing the power of the General Board, likely due to the amount of negative attention this would bring. It was agreed that the General Board should be renewed due to the continuing threat of cholera.[94] Though renewed, the General Board had lost much of its centralized power. It had also lost Chadwick, who had been the guide of the early public health movement since 1842. Opinion on this change was mixed. In the newspaper *Leader*, Chadwick's loss was lamented, as he had done so much to improve the nation's health over the years.[95] On the other hand, an article in the *Newcastle Journal* was glad of the changes to the General Board and suggested that it had failed nationally for the same reasons it had failed in London.[96] Centralization had caused the downfall of the General Board in two ways. It encouraged a dogmatic approach to ideas, and it made enemies who could point out the flaws in this dogmatic approach in order to block the General Board's ability to make improvements. Both of these factors made the General Board ineffective and thus an easy target for its opponents.

The General Board of Health continued to operate in its weakened state until 1858. With a reduction in the board's centralized power came a reduction in opposition towards it. Shortly after Chadwick's downfall, John Snow began a study into the third cholera epidemic to hit Britain. This famous study of the Broad Street pump demonstrated the waterborne nature of cholera, and though the response to it was mixed on release, it became the basis for future prevention of cholera epidemics. The medical community was moving away from miasma and

[93] UK Parliament House of Lords Debate. *The General Board of Health,* 14 July, 1854, Volume 135.
[94] UK Parliament House of Lords Debate. *Public Health Bill,* 8 August, 1854, Volume 135.
[95] "Mr. Edwin Chadwick." *Leader*, 19 August, 1854, p. 776.
[96] "News." *Newcastle Journal* (Newcastle-Upon-Tyne, England), September 9, 1854.

towards contagion.[97] In 1855 the suggestion of engineers that sewers should be implemented based on specific local factors was adopted. There would be no more single central solution to sanitary infrastructure. Sir John Simon was given the position of Medical Officer in the now severely-weakened General Board. Simon resolved to take a gentler approach, expanding centralized public health gradually through national consents rather than through Chadwick's abrasively uncompromising approach.[98] Simon would embrace the role of local government in public health that Chadwick had rejected.[99] This allowed him to set up local boards in 568 communities from 1858 to 1868, whereas only 103 communities had set up local boards under the General Board of Health.[100] As the new face of the public health movement, Simon would work alongside local government. In 1858 the waste pouring from London's sewers into the Thames began emitting a horrible smell that permeated the city in an event known as the Great Stink. Ironically, waste had been directed into the Thames underwater to prevent miasma while the General Board had control over London's sewer construction. This was only meant as a temporary measure until the waste could be directed elsewhere, but it was never fixed as the General Board lost control of the metropolis.[101] This last remnant of Chadwickian sanitary reform, indicative of the General Board's previous failures, occurred the same year that the board was discontinued and the Public Health Act replaced. The Local Government Act of 1858 placed

[97] Ball, Laura. "Cholera and the Pump on Broad Street: The Life and Legacy of John Snow." *The History Teacher* 43, no. 1 (2009): 107-109.
[98] Royston Lambert, *Sir John Simon 1816-1904 and English Social Administration* (London: MacGibbon & Kee, 1963), 231-240.
[99] Derek Fraser, *The Evolution of the British Welfare State* (London: The MacMillan Press, 1973), 61.
[100] Stephen Halliday, *The Great Filth: The War Against Disease in Victorian England* (Gloucestershire: Sutton Publishing, 2007), 23.
[101] John Broich, *London: Water and the Making of the Modern City* (Pittsburgh: University of Pittsburgh Press, 2013), 44-45.

public health in the hands of local governments by giving localities the ability to create their own sanitary authorities.[102]

Centralization caused the failure of the early public health movement because it created determined enemies. Central authority took a dogmatic approach to ideas, alienating scientists and engineers who pointed to the flaws in these dogmatic views. Businesses and local government were naturally opposed to centralization, resisting regulations and external control in the name of independence. It was opposition from these groups that caused the early public health movement and its outcome, the 1848 Public Health Act, to fail. However, Chadwick was not wrong to pursue centralization. It seems unlikely that the indecisive medical community, bickering engineers, greedy businesses, and corrupt local governments could have implemented effective public health reform without a central authority to keep them in line. In fact, improved versions of Chadwick's sanitary infrastructure and administration would shape future public health legislation in 1866, 1871, 1872, and 1875. These new measures would gradually introduce even more centralization than Chadwick had done, though in a far less abrasive manner.[103] Though centralization had caused the downfall of the early public health movement, it became an inseparable part of Britain's public health going forward.

[102] Oliver MacDonagh, *Early Victorian Government 1830-1870* (London: Weidenfeld and Nicolson, 1977), 152.
[103] Ibid., 150-152.

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