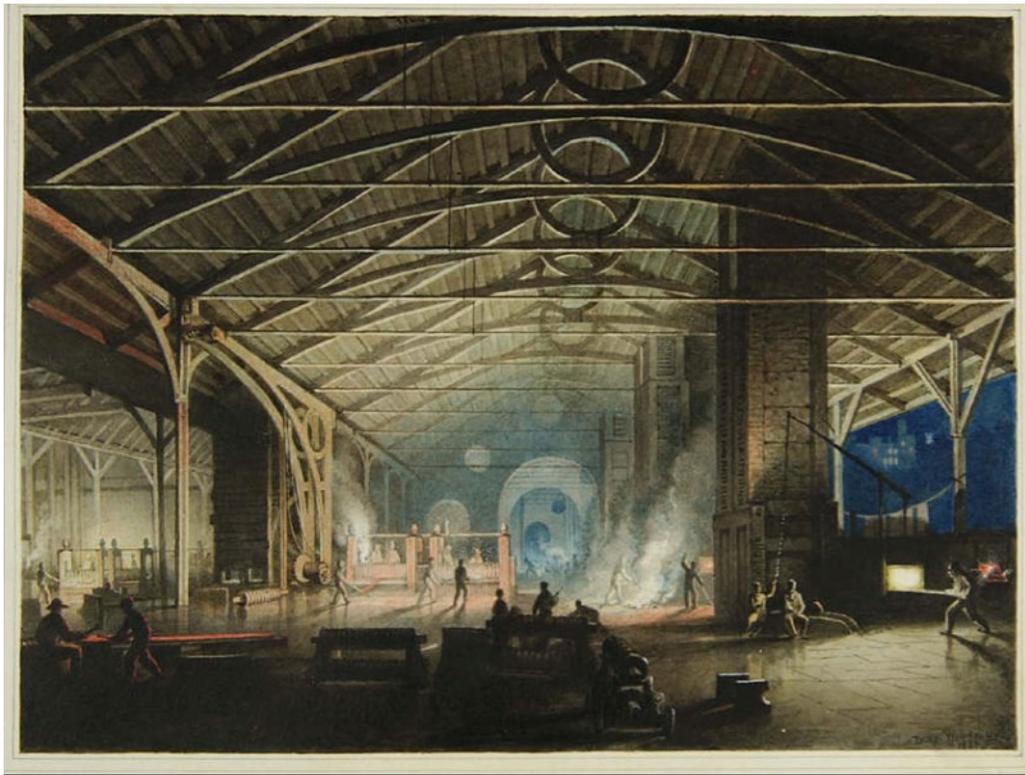


EMA for Module A329: The Making of Welsh History

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Mortality in Merthyr: Why were disease mortality rates in Merthyr Tydfil so high during the nineteenth century, c. 1840 to 1890?



Penry Williams, 'Cyfarthfa Ironworks Interior at Night' (1825). Available at: <https://www.peoplescollection.wales/items/9678> (Accessed 15 May 2021). © Cyfarthfa Castle Museum & Art Gallery 2021.

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Abbreviations

BoG - Board of Guardians

BoH - Board of Health

MOH - Medical Officer of Health

PHA - The Public Health Act of 1848

I - Introduction

*'I have seen Liverpool, Swansea, Bristol, Birmingham, Cardiff, Bath, Gloucester, Dublin and the other towns and I think that Merthyr is generally worse than either. In respect of human excrement to be seen in the immediate neighbourhood, and in respect of indecent exposure of person, I have never seen anything approaching Merthyr. All these towns have their local Acts, Merthyr has none, and I attribute the difference to this cause.'*¹

Police superintendent Henry Wrenn's quote, in an 1850 sanitation report to the General BoH, epitomises the unhealthy state of Merthyr Tydfil in the mid-nineteenth century. Merthyr underwent rapid expansion from sparsely inhabited village in the mid-eighteenth century to prominent hub of the iron and coal industries by the mid-nineteenth. As a centre of Industrial Revolution manufacturing, well-known ironworks companies such as Dowlais and Cyfarthfa grew quickly there, drawing in labour from surrounding areas and other parts of Britain and Ireland. This growth of both industry and population saw Merthyr Tydfil become Wales' largest town by the 1850s; a settlement with no overarching infrastructure or regulation, resulting in the poor public health of its largely impoverished, working-class populace.² This growth resulted in many of the problems shared with other industrialised centres; namely inferior housing, overcrowding, non-existent sewerage or running water; all of these factors a conduit to failing health and high mortality.

¹ T.W. Rammell, *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 Inhabitants of the Town of Merthyr Tydfil, in the County of Glamorgan*. (London, 1850), p. 24. Available at: https://books.google.co.uk/books?id=8ARbAAAAQAAJ&ots=kLVgJ_Je2q&dq= Accessed 15 May 2021.

² Merthyr Tydfil (Merthyr Tudful) County borough (11,102 ha; 55,981 inhabitants) in J. Davies, N. Jenkins, M. Baines et. al., *The Welsh academy encyclopedia of wales*. [Online]. Cardiff, UK: Literature Wales, (2008). Available at: https://search-credoreference-com.libezproxy.open.ac.uk/content/entry/waencywales/merthyr_tydfil_merthyr_tudful_county_borough_11_102_ha_55_981_inhabitants/0?institutionId=292 Accessed 18 March 2021.

The purpose of this dissertation is to investigate the prevalence of high disease mortality rates within the town, focusing on the time period of c. 1840 to 1890. This time period has been selected as it allows the study of the peak of the health crises in Merthyr, examining the actions of the newly established local BoH in a town otherwise without infrastructure. Cholera was one of the main contributors to mortality, with severe outbreaks occurring in 1849, 1854 and 1866 across Britain. During the 1849 epidemic alone, 3,544 deaths occurred in South Wales, with 1,682 of these centred in Merthyr at a rate of 6.1 per 1,000 inhabitants. This mortality is considerable, virtually on par with much larger London's 6.2 per 1,000 during the same epidemic.³ After appraising the contributing factors to such a high death rate, this study will then focus on the measures that were implemented in order to address the problem of high mortality, examining whether these measures were effective or not. It will consider the deficiencies in Merthyr's infrastructure, such as town planning and sanitation, that contributed to poor public health. Due to the lack of an administrative body in Merthyr, this study will examine the effectiveness of the local Poor Law BoG, and later the local BoH who took on the task of managing disease outbreaks. Once remedial measures were identified, the issues and delays faced by the local BoH and BoG upon implementation will be investigated. In addition to the disease mortality discussed above, Merthyr Tydfil also suffered from high infant mortality. Evidence suggests that infant mortality remained high in Britain until the early twentieth century,⁴ however due to its differing causal factors, it will fall outside of the scope of this dissertation.

³ Charles Creighton, *A History of Epidemics in Britain, Volume 2 (of 2) From the Extinction of Plague to the Present Time*. Project Gutenberg. (Cambridge, 1894) pp. 843-844. Available at: https://pmt.eu.hosted.exlibrisgroup.com/permalink/f/gvehr/TN_cdi_gutenberg_primary_43671 Accessed 15 May 2021.

⁴ Anthony S. Wohl, *Endangered Lives, Public Health in Victorian Britain*, (London, 1983), p. 39.

There is an abundance of existing secondary source literature focused around the topic of high mortality in Merthyr Tydfil and wider Britain. Raymond Grant's 1988 article provides an overview of the public health issues facing Merthyr during the mid-nineteenth century, looking at scarcity of clean water, inadequate drainage and sewerage, lack of public health services and the repercussions of cholera outbreak.⁵ Grant's account focuses solely on Merthyr, providing an impression of the town's poor condition, valuable for an overall understanding of the issues faced there. However, Grant does not attempt an analysis of any of these events. The article serves to recount details of nineteenth century health struggles; the absence of comparison with other areas results in a loss of valuable historiographical context. Christopher Hamlin's article from the same year, conversely, accomplishes this by placing Merthyr side by side with three other towns for comparison. His research, namely Chadwickian sanitary improvements in these towns, focuses on the enormity of such projects. Hamlin posits the idea that although improved public health was the aim for many towns, municipal officials were often delayed by considerable problems and multiple bewildering options.⁶ His wrestle with incompatible historical accounts is arguably a more convincing approach, analysing sanitary progression which has been presumed by previous historians to be straightforward. Therefore, this dissertation will seek to emulate Hamlin's method of historiographical comparison in its examination of sources.

Like Hamlin, Ieuan Gwynedd Jones (1976) discusses the sheer complexity of sanitary undertakings. His article asks whether the population of Merthyr could have survived much longer

⁵ Raymond K J Grant, 'Merthyr Tydfil in the mid-Nineteenth Century: the Struggle for Public Health', *Welsh History Review*, 14, (1988), pp 574-583. Available at: https://pmt-eu.hosted.exlibrisgroup.com/permalink/f/qvehrt/TN_cdi_proquest_journals_1310497435 Accessed 15 May 2021.

⁶ Christopher Hamlin, 'Muddling in Bumbledom: On the Enormity of Large Sanitary Improvements in Four British Towns, 1855-1885', *Victorian Studies*, 32(1), (1988), p. 81. Available at: https://pmt-eu.hosted.exlibrisgroup.com/permalink/f/qvehrt/TN_cdi_proquest_miscellaneous_78820941 Accessed 15 May 2021.

without a large-scale sanitary infrastructure being created. He examines both class conflict and political interests in the long road to improved public health.⁷ Jones draws from a wide range of primary source reports and cites the earlier influence of geographer Harold Carter in creating an accurate picture of Merthyr's social geography.⁸ Davenport, Satchell and Shaw-Taylor (2011) research the water quality and sewage contamination across British towns using cholera statistics from two nineteenth century outbreaks. Drawing upon earlier studies such as Hamlin's, they consider miasma theory and the newly emergent bacteriology, examining geographical disease spread, drawing links between water quality and cholera.⁹ This dissertation will also seek to use this approach, using cholera outbreaks as an indicator of improving public health in Merthyr over time.

Taking a more industrial viewpoint, Keir Waddington (2011) examines river pollution caused by industry in nineteenth century south Wales.¹⁰ Waddington examines the impacts upon the river Taff, which is pertinent to this dissertation due to its centrality to Merthyr Tydfil and source of the town's drinking water. Similarly, John Pritchard sheds light on the supply of water to Welsh towns. Pritchard's approach holds greater relevance to this study; whilst Waddington takes a more rural and environmental focus, Pritchard's work has a more direct bearing on the study of public health in an urban environment. He examines the discord between private and public ownership; private interests often being favoured over public. He also refers to the need for sanitary reformers to enlighten the public on the relationship between water contamination and disease; an often

⁷ Ieuan Gwynedd Jones, 'Merthyr Tydfil: The Politics of Survival', *Llafur*, vol. 2, no. 1. (1976) p.27. Available at: <https://journals.library.wales/view/1326508/1326739/23#?xywh=-132%2C571%2C3262%2C2975> Accessed 27 March 2021.

⁸ Jones, 'Merthyr Tydfil: The Politics of Survival', p. 30.

⁹ Romola J Davenport, Max Satchell, and Leigh M W Shaw-Taylor, 'Cholera as a 'sanitary test' of British cities, 1831-1866', *The History of the Family*, 24(2), (2019) pp. 404–438. <https://doi.org/10.1080/1081602X.2018.1525755> Accessed 10 May 2021.

¹⁰ Keir Waddington, 'Vitriol in the Taff: River Pollution, Industrial Waste, and the Politics of Control in late Nineteenth-Century Rural Wales', *Rural history*, 29(1), (2018) pp. 23–44. <https://doi.org/10.1017/S0956793317000164> Accessed 10 May 2021.

extensive and disheartening task.¹¹ Finally, examining the issues around overcrowding and inferior housing in Merthyr, Kate Sullivan (2011) touches upon the environmental concerns in the town, discussing legislation that sought to clear slums, particularly in working-class Dowlais.¹² Using a similar approach, this dissertation will seek to examine the measures employed to attempt to eradicate substandard housing; looking at its contribution to poor public health.

In its second chapter, this dissertation asks why disease mortality rates were so high in Merthyr. It aims to bring new light to existing historiography by examining the enormity of Merthyr's sanitation problems afresh. This will be accomplished by reappraising the issues as recorded in sanitation reports by Rammell, Snow, Kay and Camps. Rammell's 1850 report to the General BoH, containing a number of evidential interviews, is useful for this purpose. Chapter three will consider remedial measures such as drainage, sewerage and water supply outlined in Rammell's report and, if implemented, their effectiveness reflected in falling death rates. This will be twinned with a focus on the deficiencies of Merthyr's infrastructure, town planning and sanitation, examining their contribution to the town's poor health. Rammell's report, which describes Merthyr as being 'without the existence of a single regulation promotive of the good order or well-being of the community'¹³ will be the starting point for this research, also considering related accounts from local newspapers. Chapter four will ask, once identified, why the implementation of remedial measures was often delayed and explore further the roles and efficacy of the local boards in managing disease outbreaks. Overall, this study will contribute to the understanding of

¹¹ John Pritchard, 'Water Supply in Welsh Towns, 1840-1900: Control, Conflict and Development', *Welsh History Review*, 21(1), (2002) pp. 24-47. <https://doi-org.libezproxy.open.ac.uk/10.16922/whr.21.1.2> Accessed 6 April 2021.

¹² Kate Sullivan, 'The Biggest Room in Merthyr'. Working-Class Housing in Dowlais, 1850-1914', *Welsh History Review*, 17(2), (1994) p. 156-157. Available at: https://pmt-eu.hosted.exlibrisgroup.com/permalink/f/qvehrt/TN_cdi_proquest_journals_1310496050 Accessed 15 May 2021.

¹³ Rammell, *Report to the General Board of Health*, p. 12

disease and sanitary reform, such as that undertaken by Christopher Hamlin, with the aim of providing greater understanding of the issues faced by Merthyr and its inhabitants, and, in the wider frame, the issues affecting public health in Victorian Britain.

II - Death and disease - high mortality in Merthyr

*'Although Merthyr Tydfil has long been reported to be in an unsatisfactory condition as regards drainage, cleansing and water supply, I was certainly not prepared for so bad a case as my own senses and the testimony of numberless witnesses proved to be actually existing here.'*¹⁴

T.W. Rammell's 1850 assessment of Merthyr Tydfil above, chimes with the corpus of testimony emerging from the town during the mid-nineteenth century; those passing through the town agreeing upon its manifestation as 'an excessively offensive town.'¹⁵ Considering these sentiments, a study of primary source reports, such as Rammell's and investigations by Dr. John Snow, Dr. William Camps and Dr. William Kay, will seek to identify the causes of disease mortality in Merthyr, investigating its high impact upon the settlement there.

Merthyr's rapid and unchecked growth in the early nineteenth century into an industrial hub was problematic, and one that contributed greatly to its poor public health. This growth of industry saw the town's population proliferate, from 7,705 in 1801, to 46,378 in 1851,¹⁶ comprised of an influx of mainly working class people.¹⁷ These workers lived in overcrowded and densely packed housing, the spread of disease exacerbated by inadequate drainage and ventilation; very few equipped with a privy for proper disposal of excrement.¹⁸ Merthyr's lack of administrative body will be examined in Chapter three, however its need of structure and direction is relevant here.

¹⁴ Rammell, *Report to the General Board of Health*, p. 24.

¹⁵ Jones, 'Merthyr Tydfil: The Politics of Survival', p. 20.

¹⁶ See Appendix B for population growth information.

¹⁷ See Appendix C for information on social status based on occupation.

¹⁸ Rammell, *Report to the General Board of Health*, p. 22.

Aptly described by Ieuan Gwynedd Jones as ‘condensations of people’, as ‘colonies in the desert’, having no past, unsure of a future, possessing no more than *ad hoc* institutions’,¹⁹ its lack of a local governing body to promote health and sanitary reform was a key factor contributing to the elevated rates of disease mortality. This heightened mortality is demonstrated through the comparison in severity of cholera outbreak between Manchester and Merthyr. The more populous Manchester, prospering through the growth of industry, but also subject to much poverty, dirt and disease fared better in the cholera stakes; it suffered only 878 deaths in the 1849 epidemic. Manchester’s urban problems were writ large in Merthyr, where its extremes of deprivation equated to the deaths of 1,682 people during the same epidemic.²⁰

The lack of adequate water supply in Merthyr was arguably a chief contributor to disease mortality rates there. The river Taff, its flow already greatly reduced by industrial usage,²¹ was part of a wider government investigation into river pollution published in 1874. This source from the Rivers Pollution Commission scientifically examines polluted river water from industrial sources throughout Britain; its findings showed that water in the Taff arrived in Merthyr already contaminated with industrial pollutants, with drainage from the Dowlais Iron Works recorded as causing moderate level pollution.²² Although this source is useful for assigning responsibility to industry in the area for some of the poor water quality, the detriment to public health is more clearly demonstrated in the *South Wales Daily News*; where it was recorded that The Taff acted

¹⁹ Ieuan Gwynedd Jones, ‘The People’s Health in mid-Victorian Wales’, *Transactions of the Honourable Society of Cymmrodorion*, (1984) p. 121. Available at: <https://journals.library.wales/view/1386666/1421693/120> Accessed 27 March 2021.

²⁰ Creighton, *A History of Epidemics in Britain*, p. 844.

²¹ Rammell, *Report to the General Board of Health*, p. 34

²² Rivers Pollution Commission (1868). *Fifth report of the commissioners appointed in 1868 to inquire into the best means of preventing the pollution of rivers. Pollution arising from mining operations and metal manufactures. Vol. I. Report and maps.* pp 7 and 31. (London 1874). Available at: <https://parlipapers-proquest-com.libezproxy.open.ac.uk/parlipapers/docview/t70.d75.1872-048208?accountid=14697> Accessed 15 May 2021.

‘as a common receptacle for all the accumulated filth of this district.’²³ With reported evidence suggesting the river was effectively serving as an open sewer, opportunities for the collection of water for daily washing and cleaning were therefore limited to that which could be collected from the few wells and pumps that were available. Merthyr’s high incidence of cholera can be understood when considering the scant choice for collection of water presented to its residents. Water collected from a local canal fed by the Taff was reported by Rammell to be ‘eminently impure, and wholly unfitted, even after boiling, for human use’.²⁴ Further evidence of water injurious to public health can be seen when considering the town’s pumps. The spouts dispensing this water often dried up in summer, often leaving up to one hundred people queueing for water from as little as three spouts.²⁵ Modern historiography of the spread of cholera throughout Britain, such as that by Davenport et al., aids with the understanding of the heightened mortality statistics in Merthyr; water drawn from so few sources, once contaminated, enabled the spread of disease to a greater number of people.²⁶ Those able to collect their water from wells fared little better. The construction of cesspools came into question with surgeon T. J. Dyke’s testimony given in Rammell’s report, his explanation revealing the contamination from rain water passing through cesspools, thus causing ‘the offensiveness of the water from their wells’.²⁷ One of the strengths of Rammell’s account is arguably in the number of witness testimonies used in evidence, aiming to include all those ‘who might choose to be examined’.²⁸ Some examples of those interviewed are local ironmasters, medical professionals, the local MOH and vice-chair of the local BoG.

²³ Anon., ‘Pollution of Glamorganshire Rivers’ in *South Wales Daily News*, 9th May 1878, p. 3. Available at: <https://newspapers.library.wales/view/3506456/3506459/43> Accessed 7 April 2021.

²⁴ Rammell, *Report to the General Board of Health*, p. 36.

²⁵ Rammell, *Report to the General Board of Health*, p. 37.

²⁶ Davenport et al, ‘Cholera as a ‘sanitary test’ of British cities’, p. 420.

²⁷ Rammell, *Report to the General Board of Health*, pp. 32-33.

²⁸ Rammell, *Report to the General Board of Health*, p. 5.

However, a fuller picture of the town's state may have been obtained by the inclusion of a greater number of working-class interviews; although evidence has been gathered from a local grocer and a draper, its value is arguably diminished by lack of evidence from a worker connected with the iron industry.

The inertia of old theories in the light of new scientific discovery can also be seen as a contributory factor to poor public health. Significant new findings came with Dr. Snow's publication, *On the mode of communication of cholera* published in 1855, communicating the knowledge that disease bacteria were waterborne. Snow suggests that the airborne effluvia theory was waning,²⁹ in light of the discovery of reduced cases of cholera in London following the closure of the Broad Street water pump.³⁰ However, there is evidence to suggest that such findings took some time to gain traction. By comparison, eleven years later in his 1866 publication William Camps asks, *Epidemic Cholera and Epidemic Diarrhoea: Can these diseases be prevented?*, recommending a remedy known as 'the bark' for attacks of 'summer or autumn diarrhoea'.³¹ This arguably indicates that these attacks were still both regular and commonplace, thus suggesting that the bacterial cause of waterborne illnesses had not yet disseminated fully into common sanitary practices. *The Merthyr Telegraph* supports this in a report of the meeting of the Merthyr BoG, also from 1866, where some parts of the locality 'had a good deal of diarrhoea', the article inferring that these were still occurring seasonally.³²

²⁹ John Snow, *On the mode of communication of cholera*. (London, 1855), pp. 9-10. Available at: https://books.google.co.uk/books?id=-N0_AAAAcAAJ&ots=mXMcbpGyKP&dq= Accessed 15 May 2021.

³⁰ John Snow, *On the mode of communication of cholera*. (London, 1855), p. 47.

³¹ William Camps, *Epidemic Cholera and Epidemic Diarrhoea: Can these diseases be prevented? Practical suggestions for diminishing the severity of, and mortality from, these epidemics* (London, 1866) pp.3-4. Available at: <https://wellcomecollection.org/works/v7exdqhg> Accessed 15 May 2021.

³² Anon., 'Merthyr Board of Guardians' in *The Merthyr Telegraph*, 11th August 1866, p. 4. Available at: <https://newspapers.library.wales/view/3074218/3074222/23> Accessed 8 April 2021.

Lack of a proper method of sewage disposal was another contributing factor to high disease mortality rates in Merthyr Tydfil. The one main sewer that existed in the town, ran beneath Victoria Street in central Merthyr which deposited sewage directly into the Taff.³³ Raw sewage discharged directly into rivers was seen as a non-issue. Edwin Chadwick himself saw the matter of sewage in rivers as preferable to the build-up of filth in densely populated areas.³⁴ Dangers to public health can be understood with the sudden growth of the town into closely packed accommodation, causing the accumulation of excrement without the facility to remove it.³⁵ Typical methods of disposal included the dumping of excrement into the street, or simply the use of the area behind local housing. This occurrence, in an area with over a hundred houses understandably contributed to breeding grounds for disease.³⁶ These facts can be verified through the *British Medical Journal* of 1869; outbreaks of typhus had occurred in Merthyr during 1868 and early 1869, to which it attributed 402 cases that resulted in 71 deaths. The direct link between overcrowding and the spread of disease was made in the article; the disease ‘found, in the thousand back-to-back houses in Dowlais, ample means with which to work’.³⁷ Arguably, the lack of physical space with which to isolate a sick patient ensured death and disease rates remained high. Mr White, surgeon at Dowlais, expressed the idea that accumulations of dirt contributed to disease, and that ‘In no degree is the mortality due to causes over which the poor themselves have any control.’³⁸ This stance was also endorsed by William Kay, in his 1854 report to the Merthyr BoH

³³ Rammell, *Report to the General Board of Health*, p. 28. See also Appendix A for map of this location.

³⁴ Wohl, *Endangered Lives*, p. 239.

³⁵ Rammell, *Report to the General Board of Health*, p. 24.

³⁶ Rammell, *Report to the General Board of Health*, p. 31.

³⁷ Anon., ‘Fever At Merthyr Tydfil’ in *The British Medical Journal*, vol. 1, no. 438, (1869), pp. 476–477. Available at: www.istor.org/stable/25216670 Accessed 9 April 2021.

³⁸ Rammell, *Report to the General Board of Health*, p. 19.

arguing that the principles of laissez-faire impeded any sanitary progress.³⁹ Kay's statistics-heavy report provides a useful basis for comparison, particularly with its mortality rates over time, however much of the remainder of the narrative arguably reflects his own opinion, rather than the more useful witness testimony employed by Rammell.

The PHA was designed by Edwin Chadwick as a step towards improved public health, whilst aiming to reduce numbers seeking poor relief. However, at this point in time, its permissive framework only allowed local authorities to act, rather than enforcing action.⁴⁰ Therefore, at a local level, the Act did little to reduce mortality rates in Merthyr. The considerable scale of the town's poverty also proved a barrier to improvement of health. In Rammell's report, Mr John Edwards, cottage owner in Dowlais, stated that if he built a privy 'The neighbours who have none would make use of them as well'⁴¹, suggesting a reluctance by townspeople to begin improvements. Mr John Jenkins, former coal-dealer also expressed his opinion.

*'I don't think the privy accommodation is sufficient. I believe myself that the Public Health Act is a good one, but that it is not applicable to Merthyr . . . Increased rent could not be borne, and it must follow from the expense the introduction of the Act would create.'*⁴²

The above quotes effectively illustrate the continued high mortality rate in Merthyr; the predominantly working-class population could not afford the rental increases that the improvements would necessitate, thus perpetuating the cycle of poor sanitation and poor health.

³⁹ William Kay, *Report of the Sanitary Condition of Merthyr Tydfil; drawn up at the request of The Local Board of Health, and read at the meeting of the board on the 15th day of May 1854.* (Merthyr Tydfil 1854). p. 4. Available at: <https://wellcomecollection.org/works/jcrrq7pw> Accessed 15 May 2021.

⁴⁰ UK Parliament, 'The 1848 Public Health Act' (n.d.) Available at: <https://www.parliament.uk/about/living-heritage/transformingsociety/towncountry/towns/tyne-and-wear-case-study/about-the-group/public-administration/the-1848-public-health-act/> Accessed 9 April 2021.

⁴¹ Rammell, *Report to the General Board of Health*, pp. 31-32.

⁴² Rammell, *Report to the General Board of Health*, p. 46.

The want of drainage and the keeping of livestock was another problematic area contributing to death and disease in Merthyr. The keeping of cows within towns and cities was common throughout Britain, where tuberculosis contributed to mortality rates. It was not until the 1890s that government legislation called for the moving of dairies and cowsheds outside city walls.⁴³ With abattoirs located in the city centre of Manchester, blood and other animal products found their way into the city's drains and rivers.⁴⁴ These issues were magnified in Merthyr, exacerbated by the lack of drainage. Often the slaughtering of animals took place in back yards with refuse disposal into privies. Dung was collected and accumulated in heaps,⁴⁵ providing yet another breeding ground for bacteria and flies.

As described in this chapter, Merthyr's high mortality rate was directly linked to its poor sanitation. Anthony Wohl highlights the alarming statistic that 'one-third of the nation's deaths were attributable to defective or inadequate sewers and drains';⁴⁶ the accumulation of household and animal excrement arguably a conduit for disease in such densely-populated areas. William Kay in his 1854 report on sanitary conditions best exemplifies Merthyr's ailing condition and the severity of the mortality there. The crown of old age was something reserved for very few people in Merthyr; 'the sanitary condition of the locality is not favourable to the attainment of longevity'.⁴⁷

⁴³ Wohl, *Endangered Lives*, p. 84.

⁴⁴ Wohl, *Endangered Lives*, p. 84.

⁴⁵ Rammell, *Report to the General Board of Health*, pp. 29-30.

⁴⁶ Wohl, *Endangered Lives*, p. 86.

⁴⁷ Kay, *Report of the Sanitary Condition of Merthyr Tydfil*. p. 32.

III - Finding the way forward - remedial measures

*'Sanitary works well planned, well executed, and thoroughly worked, conduce to better health and longer life.'*⁴⁸

The next steps in Merthyr's road to improved public health are best illustrated by the above quote from Thomas Jones Dyke. As Merthyr's long-serving MOH, in role from 1865 to 1900⁴⁹, he oversaw much of the sanitary improvement that took place there. This chapter will outline and examine the efficacy of measures put in place to address the high disease mortality and assess the deficiencies of Merthyr's infrastructure contributing to poor public health. Following on from the PHA, a Central BoH was established. Local BoHs were created where death rates exceeded 23 per 1000⁵⁰; Merthyr's excessive rate of 31.9 per 1000 necessitated the creation of a BoH there.⁵¹ Temporary MOH William Kay's comments illustrate the dire conditions in the town at the establishment of the Merthyr BoH in 1850.⁵² He recommended sanitary improvements due to the 'vicious construction of houses- the inadequate supply of water- the absence of drainage- defective ventilation'.⁵³ By 1863, water supply to Merthyr had been completed, with a reservoir and 41 miles of water pipes at a cost of £82,000. Following this in 1868, the completion of sewerage works in the town was achieved for £28,000.⁵⁴ By way of legislation, the PHA tasked nuisance inspectors with the job of upholding standards of cleanliness at a local level. This was fortified in

⁴⁸ Thomas Jones Dyke, 'Address In Public Medicine.' *The British Medical Journal*, vol. 2, no. 1283, (1885), p. 194. Available at: www.jstor.org/stable/25273217. Accessed 14 April 2021.

⁴⁹ T. Fletcher Harvey, 'The Merthyr Sewage Farms', *Journal of the Royal Sanitary Institute* 29.10 (1908), p. 649. Available at: <https://doi.org/10.1177/146642400802901021>. Accessed 14 April 2021.

⁵⁰ UK Parliament, 'The 1848 Public Health Act'.

⁵¹ Kay, *Report of the Sanitary Condition of Merthyr Tydfil*. p. 17.

⁵² Harvey, 'The Merthyr Sewage Farms', p. 648.

⁵³ Kay, *Report of the Sanitary Condition of Merthyr Tydfil*. p. 58.

⁵⁴ Harvey, 'The Merthyr Sewage Farms', p. 649.

the Nuisances Removal and Diseases Prevention Acts of 1846 and 1848; nuisances encompassing a range of concerns, such as filthy dwellings, cesspools and privies, livestock, and build up of excrement or rubbish.⁵⁵ The Inspector of Nuisances Report from September 1856 reveals a list of offences in Merthyr needing correction, such as ineffective drainage, offensive run-off from pigsties and slaughterhouses, and offensive privies.⁵⁶ Additionally, this report entreats the local BoH to use its authority in correcting these matters. In order to address the poor and crowded condition of housing in many parts of Britain at this time, the Torrens Act of 1868 was introduced in order to ensure suitable standards in housing;⁵⁷ although it would prove inadequate in dealing with the severity of the housing problem in Merthyr. The outcomes of these introduced measures are discussed in the remainder of this chapter.

In order to gauge the efficacy of these reforms, it is necessary to examine the local mortality rates; falling rates arguably illustrative of Merthyr's improving public health. T. J. Dyke in his recount of the Sanitary History of Merthyr Tydfil, highlights a falling death rate over time, beginning with 332 per 10,000 from all causes for the eleven-year period 1846-1855, before sanitary reforms. As this dissertation is concerned chiefly with disease mortality, the portion of this related to fever, diarrhoea and phthisis equates to approximately 71.25 per 10,000. Dyke asserts that after thirty years of sanitary improvements, in the period 1876-1884, the total deaths fell to 232 per 10,000, with approximately 25.25 per 10,000 being attributable to fever, diarrhoea and phthisis. The

⁵⁵ UK Parliament, 'Nuisances' (n.d.) Available at: <https://www.parliament.uk/about/living-heritage/transformingsociety/towncountry/towns/tyne-and-wear-case-study/about-the-group/nuisances/nuisances/> Accessed 17 April 2021.

⁵⁶ Robert Scott, 'Inspector of Nuisances Report' in *The Merthyr Telegraph and General Advertiser for the Iron Districts of South Wales*, 20th September 1856, p. 3. Available at: <https://newspapers.library.wales/view/3071660/3071663/6/> Accessed 17 April 2021.

⁵⁷ Kate Sullivan, 'The Biggest Room in Merthyr' Working-Class Housing in Dowlais, 1850-1914'. *Welsh History Review=Cylchgrawn Hanes Cymru*, 17(2), p.156.

falling rate of cholera in Merthyr also testifies to the improvement of public health; Dyke reports death statistics of 267 per 10,000 in 1849, 83 per 10,000 in 1854 and 20 per 10,000 in 1866.⁵⁸ These statistics show the reduction in disease mortality in Merthyr by the mid-1880s, as a result of the provision of clean drinking water and effective sewage removal and drainage of waste water from the town's streets. Although the statistics demonstrate the efficacy of such measures, and a reduction in overall mortality, the town's mortality rate still remained high. Reasons for this can be linked to poor health caused by other sources, namely inferior housing and diseases brought about by way of employment. Kate Sullivan's assertion that housing in Merthyr did not improve until near the turn of the twentieth century⁵⁹ can be further verified through primary sources. The *South Wales Daily News* in July 1885, which is towards the end of the period under consideration for this dissertation, reports some 7,000 people still living in substandard housing, 'without in many cases the requisite sanitary considerations'.⁶⁰ The article further explains poor health was sustained through the lack of adequate ventilation due to back to back construction, many houses built with their backs directly on the earth, thus causing damp living conditions.⁶¹ One such example of inferior housing in Monmouthshire was described as an aggregation of seven houses that shared a single door and window, providing accommodation for multiple occupants, with damp permeating throughout. Comparable inadequate accommodation was recorded as typical in Merthyr too.⁶² The illnesses caused by these squalid conditions are substantiated by the statistic from Mr Dyke that acute lung conditions made up 25 percent of deaths in 1885,⁶³ revealing that

⁵⁸ Dyke, 'Address In Public Medicine.' p. 193.

⁵⁹ Sullivan, 'The Biggest Room in Merthyr'. p.164.

⁶⁰ Sanitas, 'The Housing of the Merthyr Poor' in *South Wales Daily News*, 20th July 1885, p. 2. Available at: <https://newspapers.library.wales/view/3534382/3534384/10/> Accessed 20 April 2021.

⁶¹ Sanitas, 'The Housing of the Merthyr Poor', p.2.

⁶² Jones, 'The People's Health in mid-Victorian Wales', pp, 129-130.

⁶³ Anon., 'Public Health And Poor-Law Medical Services.' *The British Medical Journal*, vol. 1, no. 1358, (1887), pp. 89. Available at: www.jstor.org/stable/20210253 Accessed 20 April. 2021.

the journey to improved public health in Merthyr was far from complete. The evidence here suggests that sanitary works alone would not ameliorate the effects of poor public health until the improvement of the crowded and inferior housing in Merthyr. Sullivan's account is useful for clarifying the scale of the problem; despite earlier slum clearing legislation being passed, its effects were unseen in Merthyr. The overcrowding issue had worsened by the turn of the twentieth century and was still far from resolved.⁶⁴

Examining the efficacy of sanitary and nuisance inspectors is arguably more of a problematic task. Nuisance legislation was introduced in reaction to diseases such as cholera, which can be seen over time to have reduced, both in Merthyr and throughout Britain. This was no-doubt in part due to the sanitary reforms undertaken, and to the ongoing standards of cleanliness upheld by nuisance inspectors. Mainly, nuisance inspection dealt with things such as poorly discarded wastes and excretions, ineffective drainage and overcrowded accommodations. However, the exact definition of a nuisance appeared to be a more nebulous concept, and therefore the measure of its success difficult to gauge. Inspectors, being faced with the challenge of 'what standards to enforce and in what degrees,'⁶⁵ meant the enforcer was at liberty to apply strict standards or fall into complacency, in line with their own standards of what constituted good hygiene.⁶⁶ Often handicapped by the need to overlook overcrowded accommodations, these upholders of sanitary standards were often confused by the remit and scope of their tasks, also hindered by the as yet poorly structured state of local administration.⁶⁷ Arguably, the effectiveness of nuisance

⁶⁴ Sullivan, 'The Biggest Room in Merthyr'. p.167.

⁶⁵ Christopher Hamlin, 'Sanitary policing and the local state, 1873–1874: a statistical study of English and Welsh towns'. *Social History of Medicine*, 18(1), (2005) p. 41.

⁶⁶ Hamlin, 'Sanitary policing and the local state' , p.44.

⁶⁷ Wohl, *Endangered Lives*, p. 197.

inspection in Merthyr, and any resulting improvements, were severely impeded by the sheer state of poverty in the town in the period under consideration.

The deficiencies of Merthyr's local infrastructure, such as town planning and sanitation were also a chief contributory factor to poor public health. Sir Henry de la Beche, in his report to the Health of Towns Commission in 1844 described the neglected state of the town, highlighting the lack of any Local Act for the provision of sufficient drainage. He noted;

‘During the rapid increase of this town no attention seems to have been paid to its drainage and the streets and houses have been built at random, as it suited the views of those who speculated in them.’⁶⁸

His words effectively illustrate the origins of the town's poor public health; the accommodation in Merthyr was arguably built rapidly to suit the requirements of the landlords. The acute lack of local administration was the result of the rapid growth of the town without consideration given to such matters as sanitation and drainage. In a local lecture given by David Evans on municipal government in 1874, the suggestion that Merthyr Tydfil was an oligarchy⁶⁹ meets with de la Beche's views, indicating that the existence of Merthyr's infrastructure was only that which suited those in control of the iron industry there. The resultant deficiencies were arguably a consequence of lack of investment in the town; the departure of its ironmasters often occurring upon retirement.⁷⁰ This laissez-faire ideology was one which permeated throughout British society at the time; most evident in Merthyr in the lack of facilities for the promotion of good health. The

⁶⁸ *Second Report of the Commissioners for enquiring into the state of Large Towns and Populous Districts* (1845), Appendix, Pt. I, 142-151; cited in G Penrhyn Jones, *National Library of Wales Journal* Vol X/3 Summer 1958, pp. 281-300. Available at: <https://journals.library.wales/view/1277425/1280936/57> Accessed 3 May 2021.

⁶⁹ Anon., 'Municipal Government for Merthyr' in *The South Wales Daily News*, 22nd October 1874, p. 2. Available at: <https://newspapers.library.wales/view/3500655/3500657/6> Accessed 3 May 2021.

⁷⁰ Anon., 'Municipal Government for Merthyr' p. 2.

consequences of this lack of investment were echoed by the General BoH, the failure to provide adequate civic government exemplified as the principles of laissez-faire being left to run their course to the detriment of the town.⁷¹ The town's administrative deficiency is further evidenced by a local September 1857 meeting to discuss the application for a Charter of Incorporation. Despite Merthyr not yet possessing the sanitary infrastructure necessary for improved public health, the town's population was on the verge of 50,000 strong,⁷² suggesting the need for civic administration was both urgent and overdue. Support for a Charter of Incorporation came from a separate meeting of the ironmasters themselves, due to the view that 'nuisances of so foul a nature existed in Merthyr that its name was infamously known throughout the kingdom.'⁷³ It was further expressed that the inhabitants of the town would benefit from the ability to remedy these nuisances through the appropriate civic body; the townspeople would gain from representation at a local level.

The argument that the local BoH were struggling to cope with health issues in the town is one that is key. This is evidenced by the manner in which the local BoH meetings were conducted, often ending in indecision or confusion. In addition to managing the high workload of the town's excessive mortality, the local BoH were granted powers to begin the construction of water works. The Board had to recommence planning after initial designs were scrapped, but only after £5,000 had already been spent.⁷⁴ Deficiencies in local BoH meetings were evident in the board's inability to respond in a timely manner to injunctions, often resulting in disarray in proceedings. One

⁷¹ Tydfil Davies Jones, 'Poor Law Administration in Merthyr Tydfil, 1834-1894' in *Morgannwg Transactions of the Glamorgan Local History Society*, Vol. 8, (1964), p.39. Available at: <https://journals.library.wales/view/1169834/1170656/46> Accessed 17 April 2021.

⁷² See Appendix B for population growth information.

⁷³ Anon., 'The Iron Masters and the Charter of Incorporation' in *The Cardiff and Merthyr Guardian*, 17th October 1857, p. 6. Available at: <https://newspapers.library.wales/view/3294266/3294272/26> Accessed 3 May 2021.

⁷⁴ Anon., 'Merthyr Board of Health' in *The Merlin and Silurian*, 25th April 1857, p. 3. Available at: <https://newspapers.library.wales/view/3397300/3397303/18> Accessed 3 May 2021.

example of such issues was an injunction over sewerage in 1869, the board assuming that if the nuisance was dealt with, then they would not be limited by time constraints. In this instance, an argument ensued, resulting in the departure of one board member from the meeting.⁷⁵

As outlined above, there was much work that was undertaken, such as sanitary reform and nuisance control that took place in Merthyr Tydfil in order to improve public health. Arguably though the severity of the problem and the lack of early civic administration proved to be heavy burdens for the town, which meant it was a number of years before improvements began to be seen.

⁷⁵ Anon., 'Merthyr Board of Health' in *The Western Mail*, 18th November 1869, p. 3. Available at: <https://newspapers.library.wales/view/4466572/4466575/46> Accessed 5 May 2021.

IV - Delays and deficiencies

The Local BoG and BoH's efforts in managing disease outbreaks were arguably greatly challenged in dealing with such acute circumstances. In 1854, the General BoH produced a report on the administration of the PHA, claiming that:

*'The Poor Law Boards of Guardians, the Inspectors of the Poor Law Board, the Union medical officers, the Local Boards of Health, and the Boards' medical inspectors are now brought into a far better state of union than in 1848, and join in willing and cordial co-operation.'*⁷⁶

Although this picture of harmony was articulated at state level, the local reality appeared to be somewhat less cohesive or co-operative than these sentiments indicate. The Merthyr BoG were already dealing with a vast poor relief programme in a large and unwieldy poor law union, resulting in public health being seen as a secondary concern.⁷⁷ Merthyr Tydfil suffered high mortality in the smallpox epidemic of 1838, particularly in the first quarter of the year where 160 deaths from the disease were registered.⁷⁸ Similarly, cholera over a decade later claimed 1682 lives.⁷⁹ The lack of hospital or workhouse, and the local BoG avoiding the provision of such facilities, arguably highlights their ineffectiveness in dealing with disease outbreaks. This is also seen in the leaving of epidemics to run their course, rather than incurring the extra costs of building appropriate treatment facilities.⁸⁰ As late as 1869, the choice of whether to provide isolation facilities to those

⁷⁶ General Board of Health, *Report of the General Board of Health on the Administration of the Public Health Act and the Nuisances Removal and Diseases Prevention Acts from 1848 to 1854*. (London, 1854). p. 11. Available at: <https://wellcomecollection.org/works/q7ncak8z> Accessed 17 April 2021.

⁷⁷ Jones, 'Poor Law Administration in Merthyr Tydfil, 1834-1894' pp.48-49.

⁷⁸ Creighton, *A History of Epidemics in Britain*, pp. 604-605.

⁷⁹ Creighton, *A History of Epidemics in Britain*, p. 845.

⁸⁰ Jones, 'Poor Law Administration in Merthyr Tydfil, 1834-1894' p. 49.

affected by epidemic disease divided opinion, as reflected in one set of minutes of the Merthyr BoG where this was debated.⁸¹ T.W. Rammell, in his 1850 report, warns against the false economy of failing to provide the appropriate sanitary arrangements, suggesting that the actual cost would be, in fact, much higher to the town.⁸² Effective management of disease outbreaks were greatly anticipated following the establishment of the Merthyr BoH in 1850. Incidences of disease were markedly reduced following the completed improvements around sanitation and drainage in the town, however where the remits of the local BoG and BoH overlapped is where inefficiencies become apparent. This is evidenced in an illustration by T.J. Dyke, MOH for Merthyr at the inception of the local BoH, who described the functions of the BoH as circles existing within the squares of the poor law union. This ineffective working is exemplified by the inadvertent creation of areas where the local BoH had no influence, such as with sick paupers in the area, who could only be assisted by the BoG.⁸³ Further lack of co-operation was highlighted between the two bodies during an epidemic of smallpox in 1872, the focus of the BoG had been lacking in locating more suitable accommodation for smallpox victims.⁸⁴ These inefficiencies appear to cast a harsh light on the local BoG in failing to work effectively with the local BoH. The realities, however, are arguably exposed when reappraising the issues at hand. Merthyr was subject to the same fluctuation in health held in common with many poor industrial areas; whenever economic depression struck, so too did poverty and sickness. It is likely, given the sheer scale of poor public health, that MOHs who reported to local BoGs in Wales were simply spread too thinly. Appointments of MOHs were on a part-time basis for a small income, however these officers

⁸¹ Anon., 'Merthyr' in *The Cardiff Times*, 19th June 1869, p. 3. Available at: <https://newspapers.library.wales/view/3385234/3385237/13> Accessed 24 April 2021.

⁸² Rammell, *Report to the General Board of Health*, p. 65.

⁸³ Jones, 'Poor Law Administration in Merthyr Tydfil, 1834-1894' p. 51-52.

⁸⁴ Jones, 'Poor Law Administration in Merthyr Tydfil, 1834-1894' p. 51-52.

covered a wide area of responsibility.⁸⁵ The outcome of these factors are evident; Merthyr BoG was simply attempting to cope with poverty on a grand scale in the largest poor union in Wales at the time.⁸⁶

Once remedial measures, such as sanitation and nuisance inspection were identified, frequently issues or delays were encountered upon putting these measures into place. It can be argued that cholera provided the much needed impetus for sanitary reform discussion, however once outbreaks had subsided, the drive for change often disappeared with it.⁸⁷ This can be linked to the still-developing state of public health efforts in mid-nineteenth century Britain; as yet not forming part of the central plan of government strategy.⁸⁸ However, over the course of the century, change can be seen in governmental responsibility for public health care; the pressures on growing unhealthy urban environments sparking further action. With Edwin Chadwick's move towards sanitary regulation, his agenda arguably promoted sanitary thinking to a wider audience. It can be seen that those dealing with sanitary reform at a local level were often met with obstacles; the best way to move forward not always being clear due to the novelty of problems faced, such as large-scale sanitary reform.

As early Public Health Acts were permissive and could not enforce action⁸⁹, this resulted in courts of law being used to bring compel action in certain circumstances. In Merthyr Tydfil, the bringing of an injunction in September 1862 by colliery bosses Nixon, Taylor and Co. to stop river pollution

⁸⁵ Jones, 'The People's Health in mid-Victorian Wales', p. 125.

⁸⁶ Jones, 'Poor Law Administration in Merthyr Tydfil, 1834-1894' p. 53.

⁸⁷ Hamlin, 'Muddling in Bumbledom', p. 59..

⁸⁸ Wohl, *Endangered Lives*, p. 142.

⁸⁹ Grant, 'Merthyr Tydfil in the mid-Nineteenth Century' p. 586.

should arguably have provided the necessary driving force in order to move forward with adequate sewerage, instead causing doubt and inaction. The sheer scale of inaction is illustrated as follows; when in July 1869 the Merthyr BoH had still not complied with the injunction, the outcome was a writ of sequestration intended to compel the board to action.⁹⁰ Mr Nixon's injunction, being considered at a BoH meeting, caused paralysis 'with the weighty responsibilities imposed on it', hoping to be able to resist the 'bold piece of impertinence'⁹¹ that the legislation represented. The uncertainty brought about by such injunctions appeared to be a feature of Merthyr locals boards' attitude when met with such obstacles. Newspaper reports from local board meetings suggest that this confusion resulted in a to and fro between options; once the option of pouring sewage into the Taff was obstructed by injunction, its sale as manure was mooted before the suggestion of spreading the sewage through irrigation.⁹² Once the irrigation scheme had been settled upon, this did not seem a guarantee against further issues or delays. The land purchase required for the scheme was delayed by parliamentary red tape before being approved. Additionally, due to the identified land not being allowed for sale, the filtration of sewage in holding tanks was required.⁹³

The Merthyr BoH was comprised mainly of the ironmasters of the town; an inevitable outcome for a town fuelled by industrial concerns. Raymond Grant's assertion that these ironmasters had 'held up Merthyr's water-supply for ten years'⁹⁴ can be further explored through the lengthy proceedings as outlined in the minutes of the local BoH. At a June 1855 Merthyr BoH meeting to

⁹⁰ Anon., 'Merthyr Local Board of Health and Messrs. Nixon & Co.' in *The Western Mail*, 13th November 1869, p. 7. Available at: <https://newspapers.library.wales/view/4466548/4466555/104> Accessed 8 May 2021.

⁹¹ Anon., 'Merthyr' in *The Western Mail*, 26th July 1869, p. 4. Available at: <https://newspapers.library.wales/view/4466013/4466017/71> Accessed 8 May 2021.

⁹² Anon., 'Merthyr' in *The Monmouthshire Merlin and South Wales Advertiser*, 8th May 1869, p. 3. Available at: <https://newspapers.library.wales/view/3438371/3438374/23> Accessed 8 May 2021.

⁹³ Harvey, 'The Merthyr Sewage Farms', p. 650.

⁹⁴ Grant, 'Merthyr Tydfil in the mid-Nineteenth Century' p. 588.

discuss waterworks plans, surprise was expressed that only four board members of a total of fifteen had attended to discuss such an important topic, resulting in adjournment and further delays.⁹⁵ Further causes of delays can be demonstrated through the BoHs initial decision to apply to parliament in order to incorporate a waterworks company for the supply of water throughout the town.⁹⁶ The board faced confusion as to whether the waterworks would include both Merthyr and Dowlais, or just the main town of Merthyr itself, with indecision over which scheme would be adopted.⁹⁷ The impact of these delays in Merthyr were conceivably of the most harm to the townspeople themselves, with water access severely limited. It is likely that without a town council or other civic body to put the peoples' interests first, the interests of the ironmasters would be paramount. John Pritchard's idea that lack of planning was a contributing factor to later lack of successful sanitary reform is reflected in the poor rate of development in Merthyr Tydfil. He saw the conflicts between public and private ownership as an obstruction which had long-lasting effects.⁹⁸ He also saw the lack of co-operation between private companies and local bodies as a further barrier to effective reform.⁹⁹ This incompatibility between public and private ownership is evidenced in minutes of local BoH meetings. Discussion about prohibitive charges for water services from private companies was a problem; board chair, Mr Clarke needing a guarantee of priority service for the people of Merthyr. It was felt that this guarantee could not be obtained from a private company.¹⁰⁰

⁹⁵ Anon., 'Merthyr' in , *The Monmouthshire Merlin*, 1st June 1855, p. 5. Available at: <https://newspapers.library.wales/view/3396362/3396367/53> Accessed 8 May 2021.

⁹⁶ James W. Russell., 'Merthyr Tydfil Water-Works' in , *The Cardiff and Merthyr Guardian*, 15th November 1851, p.2. Available at: <https://newspapers.library.wales/view/3090135/3090137/12> Accessed 8 May 2021.

⁹⁷ Anon., 'Merthyr' in *The Merlin and Silurian*, 28th June 1856, p. 5. Available at: <https://newspapers.library.wales/view/3396878/3396883/28> Accessed 8 May 2021.

⁹⁸ Pritchard, 'Water Supply in Welsh Towns', pp. 24–25. <https://doi-org.libezproxy.open.ac.uk/10.16922/whr.21.1.2> Accessed 6 April 2021.

⁹⁹ Pritchard, 'Water Supply in Welsh Towns', pp. 29. <https://doi-org.libezproxy.open.ac.uk/10.16922/whr.21.1.2> Accessed 6 April 2021.

¹⁰⁰ Anon., 'Merthyr' in *The Merlin and Silurian*, 28th June 1856, p. 5.

These issues and delays faced by Merthyr BoH were just some of those faced throughout Britain in the long road ahead to effective sanitary reform. The radical changes required were unique to many boards dealing with these issues, the way forward often presenting many ambiguous options.

V - Conclusion

The intention of this dissertation has been to illustrate the complexities of everyday existence in the formative years of Merthyr Tydfil as an industrial town in Victorian Wales. It examined the difficulties surrounding health and lacking sanitary infrastructure associated with newly industrialised, newly urban societies. Whilst the issues and relationship around health and sanitary infrastructure have been amply explored, there is a great deal of scope for further research, such as the drivers behind such high infant mortality during this period. In addition, inferior housing was a live issue that continued well into the twentieth century before it was adequately addressed and therefore could only be partly reviewed here.

The second chapter began by asking why disease mortality rates were so high in Merthyr Tydfil. Comprehensive investigations such as those by Rammell and Dyke have been useful to gain a snapshot of the town. They reveal an unprecedented growth of an urban environment, whereby a town comprised of mainly poor, working class occupants, packed in close quarters enabled the spread of disease throughout the locality. This urban industrial environment, such as had not been seen in Britain before, contributed to disease mortality due the wholesale lack of any sanitary facilities. As seen in the research presented, polluted local rivers teamed with insufficient supplies of clean running water were principal contributory factors to diseases such as cholera gaining a major foothold there. Newly emergent theories about waterborne bacteria, such as those discussed by Camps began to circulate, but as shown in the analysis, these findings took time to become embedded in sanitary practices. Although steps towards sanitary reform were promoted by Edwin Chadwick, the discussion has shown that legislation often lacked the necessary compulsion

towards action; Merthyr's lack of civic structure and sizeable poverty presenting a barrier to improvement of public health.

This dissertation then explored the efficacy of measures employed to address Merthyr's high mortality and discussed the deficiencies of the town's infrastructure which led to poor public health. As evidenced in this chapter, although improved drainage, sewerage and water supplies resulted in an upturn of public health; the living accommodation in the town was far from improved; still greatly contributing to continued high mortality. Given the evidence discussed, it is likely that despite the improvements mentioned above, the health issues faced were simply too great to be solved through sanitary reform alone. Although measures such as nuisance inspection and joint efforts of the local BoG and BoH were put into action the evidence suggests that these could only ever be piecemeal approaches. The magnitude of poverty in Merthyr, teamed with the interests of the ironmasters at the forefront of local life and the sorely lacking civic administration needed to relieve poverty and poor public health, meant that the long road to improvement was still largely ahead.

In the final chapter, the local BoH and BoG's efforts in managing disease outbreaks were analysed, and an investigation into the reasons behind issues and delays in remedial measures was undertaken. The local BoG were responsible for administration of poor relief in the Merthyr union, sometimes overlapping with the remit of the BoH in dealing with the sick. The issues appraised by this investigation found that inefficiencies not only arose where the two bodies overlapped, but also due to the sheer scale of the poverty that they were dealing with. This was in-part due to Merthyr's nature as an industrial town where sickness closely followed poverty after periods of

economic depression. Delays in implementing remedial measures were brought about by the permissive nature of Public Health legislation, but also by injunctions brought against the Merthyr BoH due to the existence of river pollution from local sewage. Efforts to establish water supplies in the locality had sparked the debate of whether to provide these as a public or a private company resulting in further setbacks. The evidence presented here arguably depicts a BoH with a poverty and sanitation problem on a gargantuan scale; the way forward crowded by many differing options, many of which were only a partial solution to the health issues in Merthyr.

This dissertation aimed to contribute to the historiography of poor public health in Victorian Wales by further appraisal and comparison of primary source data available through reports published by Rammell, Kay, Snow and Camps. Through the study of the findings and testimonies in these reports analysed in one place, a picture has been built of a town that grew rapidly to its detriment in the years discussed here. The multiple afflictions of absent sanitary infrastructure, poverty, inferior and overcrowded housing, and non-existent civic administration were all ingredients in the mix that contributed to high disease mortality in Merthyr Tydfil.

Appendix A

Map of Merthyr Tydfil (1870s) showing Victoria Street (Sewer Location) and the River Taff.

IMAGE REMOVED FOR COPYRIGHT REASONS

Digimap, Map of Merthyr Tydfil, 1870 [Online]. Available at: <https://digimap.edina.ac.uk/roam/map/historic> Accessed 9 April 2021.

Appendix B

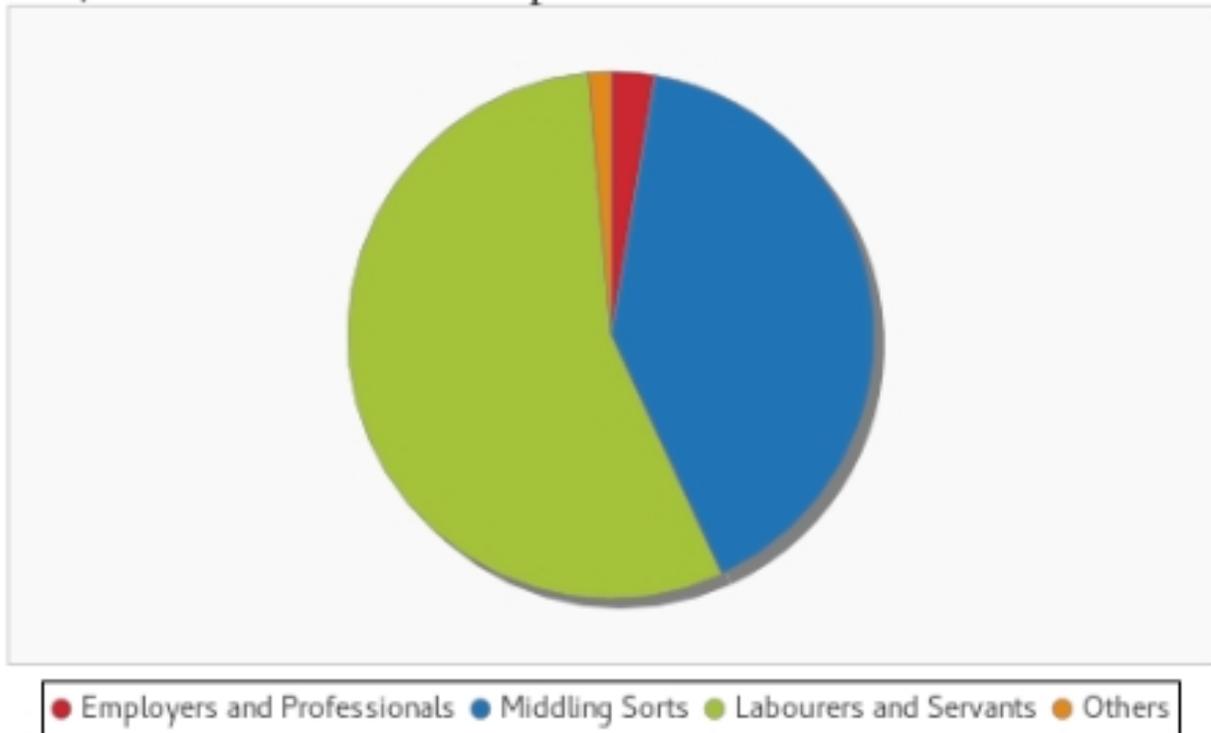
Merthyr Tydfil - Total Population

Year	Population 20 years earlier	Population 10 years earlier	Current Total Population
1801			7,705 ◀
1811		7,705 ◀	11,104 ◀
1821		11,104 ◀	17,404 ◀
1831		17,404 ◀	22,083 ◀
1841		22,083 ◀	34,977 ◀
1851		34,977 ◀	46,378 ◀
1881		51,949 ◀	48,861 ◀
1891		48,861 ◀	58,080 ◀
1901		59,004 ◀	69,228 ◀
1911		69,228 ◀	80,990 ◀
1921		80,990 ◀	80,116 ◀
1931		80,116 ◀	71,108 ◀
1951	71,108 ◀		61,142 ◀
1961		61,142 ◀	59,039 ◀

GB Historical GIS / University of Portsmouth, Merthyr Tudful AP/CP through time | Population Statistics | Total Population, *A Vision of Britain through Time*. Available at: http://www.visionofbritain.org.uk/unit/10243610/cube/TOT_POP Accessed 6 April 2021.

Appendix C

Merthyr Tydfil - Social Status based on 1831 occupational statistics



GB Historical GIS / University of Portsmouth, Merthyr Tudful AP/CP through time | Social Structure Statistics | Social Status, based on 1831 occupational statistics, *A Vision of Britain through Time*. Available at: <http://www.visionofbritain.org.uk/unit/10243610/cube/SOC1831> Accessed 6 April 2021

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