PLACE, POLLUTION AND PUBLIC HEALTH: MUNICIPAL RESPONSES FOR SANITATION IN BIRMINGHAM 1840s-1920s

A thesis submitted to the University of Birmingham for the degree of

DOCTOR OF PHILOSOPHY

By

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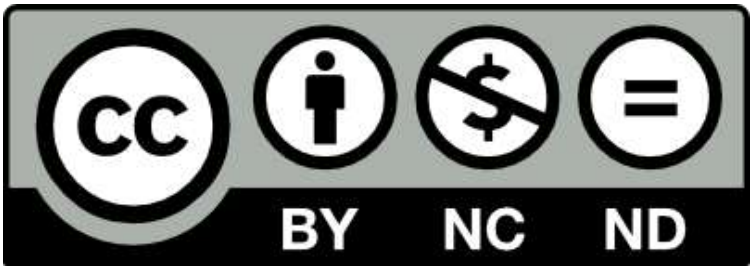
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ABSTRACT

This thesis explores the municipal responses to poor sanitation and river pollution in Birmingham between the 1840s and the 1920s. It assesses the impact and effectiveness of those responses on the health of England's second largest city and re-examines the contemporary view of the city's governance and the alleged association of sanitation reform and 'municipal socialism' linked to one of the city's political figures, Joseph Chamberlain. This history of sanitation, set within its political, social and economic contexts, examines the development of utilities for water supply and sewage treatment in Birmingham and offers the first thorough academic analysis of the broader municipal policy towards public health in the city during that period. It also explores the development of municipal systems and public health administration, as well as medical theory and practice, and is therefore a history of the urban environment that overlaps with the social history of medicine.

To examine the interrelationship and importance of place, people and policy this study adopts a microhistorical approach to appraise a single local authority, particular committees, specialised roles and individuals. Attention is given not only to those who governed, but also to people who worked within those systems. Close analysis of place-specific primary sources, some never used before and produced by those involved, has facilitated a fuller contextualisation of municipal responses and reveals the nature and effectiveness of local government systems dealing with public health.

The research findings reveal not a sanitary revolution but rather a lengthy foundational period of local government development and investment in sanitary infrastructure before Birmingham had the capability to address poor sanitation for all citizens. While this foundational period did not have an immediate positive impact on the health of the city's poorest between 1870 and 1904, it nevertheless throws new light on the living conditions in the courts of back-to-back housing and adds significantly to an understanding of the impact of waste management systems. This challenges the image of Birmingham closely linked to Chamberlain and his impact on sanitation and municipal socialism in the 1870s and 1880s; an image this thesis argues is far from justified. The findings can feed into debates surrounding urban sanitation, infrastructure investment and its effects on mortality, and underscores the importance of place-specific contextualisation.

The impact of Birmingham's first two Medical Officers of Health is also considered within place-specific, medical and contemporary understandings of disease contexts, with a reassessment of their impact on infant mortality in the city. This thesis adds significantly to an understanding of Birmingham's municipal history and extends the historiography for the beginnings of the water industry in England and Wales and the history of public health in Britain.

ACKNOWLEDGEMENTS

I should like to thank my lead supervisor, Malcolm Dick, for his patience, consideration and unfailing support throughout, especially at times of difficulty. I am grateful for the many opportunities Malcolm has steered me towards, all of which have informed and enriched this thesis. Also, my gratitude goes to my co-supervisor Matt Cole, also the supervisor of my MA dissertation, and a source of encouragement to develop my research further.

I am grateful to colleagues on the Board of the journal, *Midland History*, in the Society for the Social History of Medicine, History West Midlands Ltd and Archives West Midlands for their support, encouragement and advice. I should also like to thank the archivist teams at Birmingham Archives and Collections, Library of Birmingham and Cadbury Research Library, Special Collections at the University of Birmingham for their collection expertise, sharing their knowledge and assisting with images. I am particularly grateful to David Beattie for his excellent copy editing of this thesis.

I have been fortunate in my six-and-a-half-year journey to be part of an active community, the Friends of the Centre for Midlands History and Cultures (formerly known as Centre for West Midlands History). This community has been a great source of friendship, support and inspiration and I am particularly grateful to fellow Committee members Judith Davies, Sally Davison, Ginny Hartley, Steve Hewett, Elaine Mitchell, Kate Mulcahey, Caroline Archer-Parré, Guy Sjögren, Sue Thomas, Sue Tungate and Centre Directors, Malcolm Dick and Imogen Peck. Special mention goes to John Townley for his interest, sharing of knowledge and supply of relevant primary sources and maps.

I also acknowledge the valuable support of the late Peter T. Marsh, author of *Joseph Chamberlain: Entrepreneur in Politics* (1994), who took a great interest in my research when I worked as his research assistant for *'The House where the Weather was Made': A Biography of Chamberlain's Highbury* (2019), the family home of Joseph Chamberlain in Birmingham. Our stimulating conservations about 'Joe' and Thomas Avery were a great source of inspiration. This enriching opportunity was made possible through the generous support of publisher Mike Gibbs and History West Midlands Ltd.

I have also been particularly fortunate to be able to share some aspects of my research in a first-year undergraduate course, called 'Fighting the Filth' within the 'People and Places' module. This too has been an enriching experience and of benefit to this thesis and my gratitude extends to Matt Houlbrook, Tara Hamling and Jacob Fredrickson of the Department of History, University of Birmingham and to the input of the students I taught.

Finally, my enduring gratitude goes to my family for their patience, belief and understanding of something I had to do.

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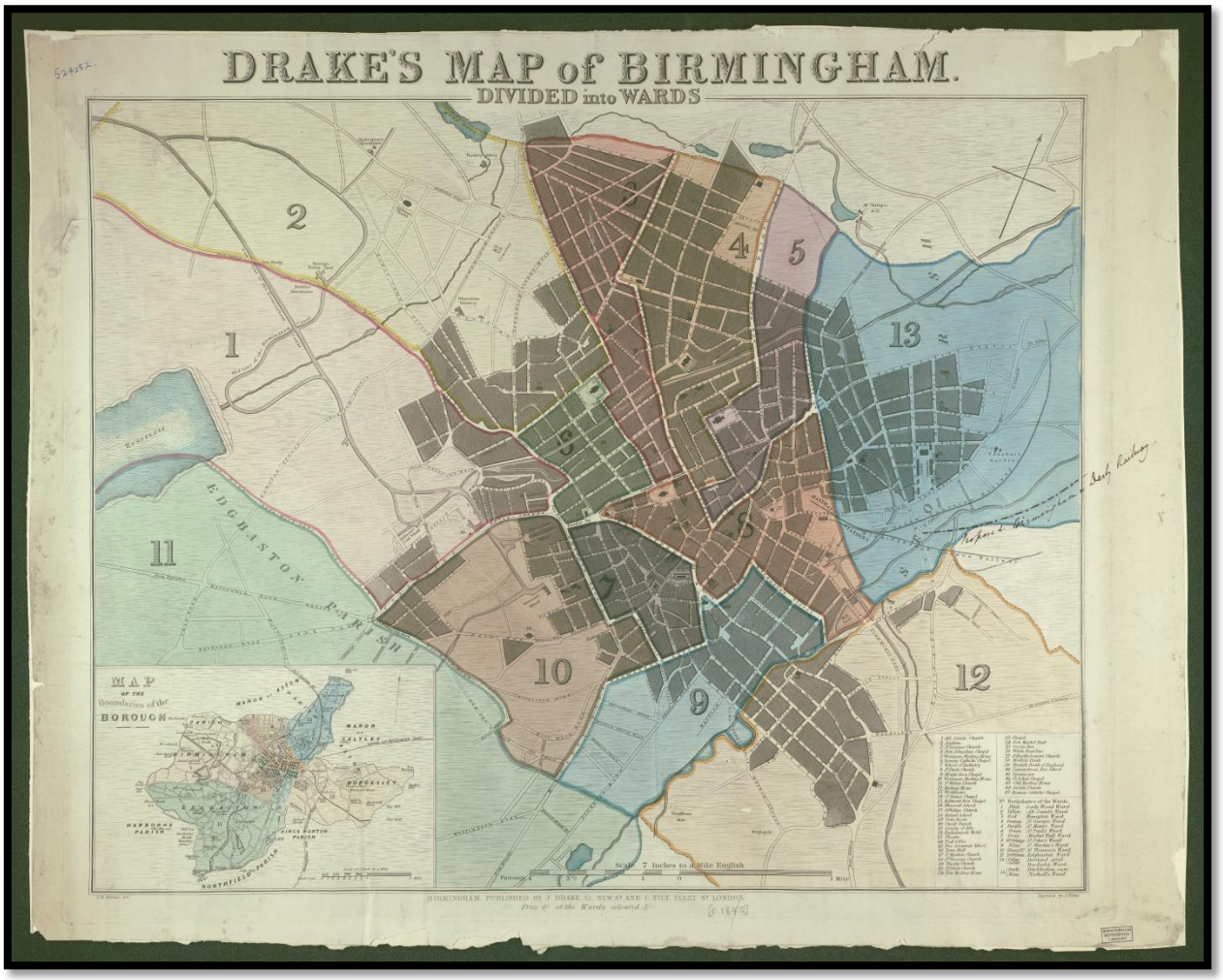
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LIST OF ABBREVIATIONS AND CONVENTIONS USED

BAC	Birmingham Archives and Collections, Library of Birmingham
BCC	Birmingham City Council Archive
BDP	*Birmingham Daily Post*
BLA	Birmingham Liberal Association
BHS	Birmingham Heredity Society
BTRDDB	Birmingham Tame and Rea District Drainage Board
CHP	Combined Heat and Power
CMO	Chief Medical Officer
CRLSC	Cadbury Research Library Special Collections, University of Birmingham
EES	Eugenics Education Society
FoBAH	Friends of Birmingham Archives and Heritage
IMR	Infant Mortality Rates
ION	Inspector of Nuisances
JRSI	*Journal of the Royal Sanitary Institute*
LGB	Local Government Board
MOH	Medical Officer of Health
MOHs	Medical Officers of Health
NEL	National Education League
ODNB	*Oxford Dictionary of National Biography*
PHA	Public Health Act [year]
PWC	Public Works Committee
RSC	Royal Sanitary Commission
SBS	'Sanitary-Bacteriological Synthesis' [1]
SMOHs	Society of Medical Officers of Health

The period covered by this thesis saw Birmingham's status change from town to city in 1889. Because most of the individual chapters in this thesis span the years before and after 1889, the author's general practice has been to refer to Birmingham as a city. She is sensitively alert to the terminological distinctions at stake but trusts that this note of clarification will serve to dispel any confusion.

[1] A term used by David Barnes, see D. Barnes, *The Great Stink of Paris and the Nineteenth-Century Struggle against Filth and Germs* (Baltimore, 2006), pp. 134-135.



J. Drake (Birmingham) & C. Tilt (London), 'Drake's Map of Birmingham divided into wards', drawn by I. B. Wallace, engraved by J. Tolley (c.1840). Birmingham Archives and Collections, MAP/524282. Reproduced with permission of Library of Birmingham.

RELEVANT TIMELINE FOR BIRMINGHAM

1831 Cholera first arrived in Britain (there were further epidemics in 1848, 1853 and 1866). Birmingham was fortunate in that there were only 24 reported deaths.

Birmingham Waterworks Company supply began supply on 17 August to 43 customers from its sole source of supply, the River Tame.

1836 The **Registration Act** established the General Register Office and a system of registration for births, marriages and deaths to take effect from 1837.

1838 Birmingham was incorporated as a municipal borough. The borough consisted of the parishes of Birmingham, Edgbaston and part of the parish of Aston.

1842 Edwin Chadwick published his *Report on the Sanitary Conditions of the Labouring Population of Great Britain*.

1843 The Health of Towns Royal Commission was established with Edwin Chadwick as Chair; he proposed a change from conservancy systems to water-carriage as a solution to unsanitary conditions.

1845 Robert Slaney's report on Birmingham was published as part of the Health of Towns Commission.

1846 The **Nuisances Removal and Diseases Prevention Act** was designed as a temporary act to assist in stopping the spread of cholera. It set out procedures to remove nuisances. It was updated in 1848 alongside the Public Health Act and made provisions for removing nuisance and the prevention of disease in places where the Public Health Act was not in force.

1847 The **Towns Improvement Clauses Act** legalised discharge of sewage from sewers into rivers and the sea and allowed sale for agricultural purposes if it did not cause public nuisance. Encouraged other improvements and powers to appoint full-time medical officers.

England's first Medical Officer of Health, William Henry Duncan, was appointed in Liverpool.

1848 This **Public Health Act** created the General Board of Health and Local Boards of Health and granted permissive sanitary powers. This was strongly opposed in Birmingham on the grounds of anti-centralisation.

1849 Robert Rawlinson's influential *Report to the General Board of Health on a Preliminary Inquiry into the Sewerage, Drainage and the Supply of Water and the Sanitary Condition of the Inhabitants of the Borough of Birmingham* was published and laid the foundations for an improvement act.

John Snow argued for the water-borne transmission of disease theory with his work *On the Mode of Communication of Cholera.*

1851 This first **Birmingham Improvement Act** saw the council take over responsibility for public works functions of the Street Commissioners of Birmingham, Deritend & Bordesley, Duddeston & Nechells and the parish officials of Edgbaston.

The **Common Lodgings House Act** gave local authorities powers to inspect and supervise maximum numbers, cleaning and ventilation and segregation of the sexes.

1852 Formal transfer of Street Commissioners' powers to Birmingham council.

A Borough Surveyor, Assistant Surveyor and Inspector of Nuisances were appointed. John Piggot Smith, former surveyor to the Street Commissioners, became Borough Surveyor.

1853 The **Vaccination Act** introduced compulsory vaccination of all infants in England against smallpox.

1854 The famous Broad Street pump incident where, during a cholera epidemic, the closing-off the pump saw cases dramatically drop, identifying the source of infection. It provided the proof for John Snow's water-borne transmission of disease theory.

An industrial accident with a gas tank explosion polluted the River Tame, killed fish and disrupted the piped supply of Birmingham Waterworks Company.

1855 The **Nuisances Removal and Diseases Prevention Act** saw the consolidation and amendment of earlier acts. It required local authorities to employ sanitary inspectors and gave powers to enter properties containing nuisances.

1857 John Piggot Smith was replaced by his assistant, William Spooner Till, as Borough Surveyor.

1858 This **Public Health Act** replaced an earlier act and abolished the General Board of Health, with the Local Government Board and Privy Council taking over responsibilities.

The **Medical Act** saw the registration of doctors and establishment of the General Medical Council.

The 'Great Stink' on the Thames between July and August brought river pollution through sewage and industrial effluent to government and national attention.

C. B. Adderley (later Lord Norton) began legal action against Birmingham council for sewage nuisance of the River Tame, considered to be the first case of its kind.

1860 The **Adulteration of Food Act** gave local authorities powers to control the adulteration of food and appoint analysts. Birmingham physician John Postgate and MP William Scholefield were instrumental in the campaign behind this act.

1861 The second **Birmingham Improvement Act** enlarged the powers conferred in 1851.

A Borough Analyst was appointed for Birmingham, Dr Alfred Hill.

1865 A Royal Commission began to investigate river pollution; its final report was issued in 1874.

1866 The **Sanitary Act** gave powers for Government to act against local authorities that did not provide sufficient sewers, water supply and street cleansing. For local authorities it gave some powers on matters such as connection of sewers, water supply, street cleansing and overcrowding.

1868 The **Artisans and Labourers' Dwelling Act** gave powers to local authorities to demolish or repair insanitary housing.

A Social Science Congress was held in Birmingham and the poor sanitary conditions for the poorer working classes were noted.

This year saw a very hot summer with drought conditions; Birmingham's death rate soared.

1869 Thomas Avery's attempt to win council approval to pursue purchase of the Birmingham Waterworks Company was thwarted.

Creation of the National Education League to campaign for universal, free and unsectarian education.

Joseph Chamberlain was elected to the council along with other Liberal candidates.

1871 The **Local Government Board Act** brought takeover of the administration of the Poor Law and public health work from the Privy Council. Public health responsibilities included disease prevention, vaccination, registrations, public improvements and provision of baths.

Birmingham's council established the Sewage Inquiry Committee to look at the sewage question in Birmingham and consider how to answer the Court of Chancery actions against them for sewage nuisance.

Prohibition of the River Tame as a domestic source of water supply.

1871 Census population 343,787; deaths 8594; overall death rate per 1000 population 24.9.

1872 The **Adulteration of Food, Drinks and Drugs Act** strengthened and extended the 1860 Act.

The **Public Health Act** placed public health under new Urban and Rural Sanitary Authorities and made it compulsory to appoint an Inspector of Nuisances and Medical Officer of Health (MOH) in urban areas. Birmingham was made an Urban Sanitary District and the council an Urban Sanitary Authority.

The Borough Inspection Committee was renamed the Sanitary Committee.

Birmingham's Borough Analyst, Dr Alfred Hill, was appointed as the MOH for Birmingham in December.

After the Sewage Inquiry Committee's recommendations had been accepted by the council, the Birmingham Sewage Bill failed to pass through Parliament.

A new Sewage Committee was established and took over responsibility for the council's sewage works and nightsoil from the Public Works Committee (PWC), responsibility for sewerage remained with the PWC.

1873 A new Department of Interception was created to operate the new privy pan (pail) scheme introduced in Birmingham. Based on the Rochdale system, its principal aims were to exclude sewage from sewers, reduce pollution of the River Tame and replace the midden (ashpit) system.

Joseph Chamberlain became mayor of Birmingham.

1875 This major **Public Health Act** consolidated and extended the provisions of previous acts.

Birmingham Gas and Water Acts passed through Parliament.

Alderman Avery, as Chair of the new Water Committee, negotiated the purchase of the Birmingham Waterworks Company.

The **Artisans and Labourers' Dwellings Improvement Act** gave powers to clear and re-build slum areas.

A Sanitary Survey of the borough was undertaken by the council.

1876 Responsibility for the waterworks was officially transferred to the council on 1 January.

The Sanitary Committee (formerly Borough Inspection Committee) was once again renamed the Health Committee, with William Cook as chair.

Birmingham's MOH finally granted powers to order closure of polluted wells.

The **Rivers Pollution Prevention Act** saw the first **l**egislation specifically for river pollution, but the act had weaknesses.

The **Birmingham Improvement Scheme** (under the Artisans and Labourers' Dwellings Improvement Act) cleared slums in St Mary's ward and saw the creation of the commercial area, Corporation Street. It was criticised for rising costs and that it did not replace housing with affordable rental properties for those who had been displaced.

Joseph Chamberlain became MP for Birmingham (and remained so until 1914).

1877 The Birmingham Tame and Rea District Drainage Board (BTRDDB) was established, a joint district scheme to treat sewage and reduce pollution of rivers. The council transferred powers, and its lands at Saltley were purchased by the Board. A system of sewage farming was established along the Tame Valley. By 1905 the Board was responsible for the largest sewage farm in England and the third largest in Europe.

Thomas Avery was elected chair of the Drainage Board and William Harris was appointed clerk.

The **Canal Boats Act** gave powers to authorities to inspect boats and restrict the number of people living on board (amended in 1884).

1878/9 Serious fires at Digbeth and the Central Free Library led to complaints against the council, as owner of the waterworks, about inadequate water supply for firefighting. Council policy changed to make water supply for fires a priority.

The **Factories and Workshops Acts (**1878, 1891, 1895) limited the number of working hours for children and set a maximum 12-

hour working day for young adults and women. The Health Committee was responsible for inspections.

The **Dairies, Cowsheds and Milkshops Orders** (1879, 1885) also came under the remit of the Health Committee and inspection staff.

1881-8 Birmingham Museum and Art Gallery opened in 1885 and Birmingham Municipal School of Art created.

1881 Census population 400,774; deaths 7938; overall death rate per 1000 population 19.7.

1889 The **Infectious Diseases (Notification) Acts 1889 & 1899 introduced** compulsory notification of infectious diseases. Birmingham Health Committee operated a system of notification before this compulsory act.

The municipal borough of Birmingham was reconstituted as a county borough.

Birmingham was granted city status by Queen Victoria.

1890 The **Housing of the Working Classes Act** introduced a framework to clear slum housing along with regulations on overcrowding and minimum standards for accommodation.

1891 City boundary extension which saw Balsall Heath, Saltley, Little Bromwich and Harborne (becoming part of Edgbaston Ward) come under the authority of Birmingham City Council.

1891 Census population 478,113; deaths 9317; overall death rate per 1000 population 21.7

1892 The **Birmingham Corporation Water Act** granted the council powers to borrow for the construction of dams and reservoirs to capture the water of the Elan and Claerwen valleys, as the new source of supply for the city.

Thomas Avery retired from the council and as chair of the Drainage Board due to ill-health after a civic career of thirty years.

1899 The first female health visitors employed by the council.

1900-1 Experimental bacteria beds were constructed at the Saltley Works under direction of Drainage Board engineer John Duncan Watson.

1901 Census population 522,204; deaths 10,402; overall death rate per 1000 population 20.0

1903-10 MOH Dr Alfred Hill retired, and Dr John Robertson was appointed as his successor.

Expansion of bacterial sewage treatment with the construction of the UK's first large-scale percolating plant between Saltley and Minworth in the Tame Valley area.

1904 Completion of the Elan Valley Scheme, officially opened by King Edward VII and Queen Mary in July. Through the 73-mile aqueduct, water from Wales arrived at Frankley Reservoir to be distributed across the city.

Report of the Inter-Departmental Committee on Physical Deterioration is published.

1906-7 New legislation to tackle infant mortality was introduced, giving powers for authorities to offer free school meals and school medical examinations.

Notification of Births Act was adopted in Birmingham, ensuring that births should be notified so that a health visitor could attend (this became compulsory in 1915).

1909 Boundary extension with the civil parish of Quinton incorporated into the Borough and added to Edgbaston & Harborne Ward.

Birmingham's first municipal sanatorium for tuberculosis patients was opened at Salterley Grange near Cheltenham (the council purchased the site in 1907).

Housing and Town Planning Act finally made building back-to-back housing illegal (although bye-laws in Birmingham prevented the building of new back-to-back housing from 1876).

1911 The **Greater Birmingham Act** saw the city boundaries expand, with Acocks Green in Yardley, Aston & Lozells, Erdington North & South, Handsworth & Soho, King's Heath, King's Norton & Northfield, Moseley, Selly Oak, Sparkbrook, Sparkhill and Yardley becoming part of Birmingham.

1911 Census population 525,833; deaths 8892; overall death rate per 1000 population 17.00. These figures are for the area as at 1909 boundaries; the population under the extended boundaries in 1911 was 804,202.[1]

1914 Start of First World War.

The privy pan system in Birmingham was finally phased out.

1918 The **Maternity and Child Welfare Act** ensured provision of services for the health of mothers and children under the age of five.

1919 Ministry of Health established.

1921 **Public Health (Tuberculosis) Act**

1927 Birmingham's second MOH, Sir John Roberston, retired.

[1] This timeline was compiled using J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885); Vince, *History of the Corporation*, *Vol. III* (Birmingham, 1902); J. Fisher, A. Cotton, and B. Reed, 'Public Health Reform: Lessons from History,' *Proceedings of the Institution of Civil Engineers - Municipal Engineer* , 159, 1 (2006), pp. 3-10; C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 317-322; Policy Navigator, Public Health, *The Health Foundation* (2020) available at https://navigator.health.org.uk/theme?theme=1 [accessed 30 September 2020].

Chapter One

Introduction

In 1890, Julian Ralph in *Harper's Magazine* declared that Birmingham, in the midlands of England, was 'the best-governed city in the world' and the city and its municipality in later literature has been presented as an exemplar of 'gas and water' or 'municipal socialism'.[1] In the most recent history of the city, Richard Vinen has reiterated earlier claims that 'sanitation came to be strongly associated with a certain image of Birmingham' and one of its leading political figures, Joseph Chamberlain.[2] It is therefore surprising that detailed accounts of sanitation in Birmingham are lacking and, as Jonathan Reinarz points out, the historiography on public health in Birmingham before 1872 is 'scattered'.[3] In the social and political histories of Victorian cities or solely of Birmingham, the political and social aspects of sanitary improvements, municipalisation and death and disease within an urban environment are more often discussed, although not in great depth.[4] This prompts further research to address missing

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[1] J. Ralph, 'The Best-Governed City in the World', *Harper's Magazine*, 81, 481 (1890).
For more on municipal or (gas and water) socialism and Birmingham, see the chapter 'Birmingham: The Making of a Civic Gospel' in A. Briggs, *Victorian Cities* (Middlesex, 1968), pp. 184-240; E. P. Hennock, 'Part II: The Municipal Gospel' in Book 1 Birmingham, *Fit and Proper Persons: Ideal and Reality in Nineteenth-Century Urban Government* (London, 1973), pp. 61-176; T Hunt, 'Joseph Chamberlain and the Municipal Gospel', *Building Jerusalem: The Rise and Fall of the Victorian City* (London, 2004), pp. 313 – 380; J. P. Gherke, 'A Radical Endeavour: Joseph Chamberlain and the Emergence of Municipal Socialism in Birmingham', *The American Journal of Economics and Sociology*, 75 (2016), pp. 23-57; D. Fraser, 'Joseph Chamberlain and the Municipal Ideal', *History Today*, 37, 4 (1987); R. Vinen, 'Chamberlain's Birmingham', in *Second City: Birmingham and the Forging of Modern Britain* (London, 2022), pp. 69-110.
[2] See Appendix 1: Index of Persons; Vinen, *Second City: Birmingham,* p. 96 and pp. 69-110 for a chapter dedicated to 'Chamberlain's Birmingham'. I. Cawood and C. Upton (eds), *Joseph Chamberlain: International Statesman, National Leader, Local Icon* (Basingstoke, 2016). A fuller overview of scholarship on Joseph Chamberlain is listed in Chapter 3 of this thesis.
[3] J. Reinarz, 'Industry and Illness: Investing in Health and Medical Provision' in C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 239-259, p. 253.
[4] For examples, see A. Briggs, *A History of Birmingham, Vol. II: Borough and City 1865-1938* (London, 1952) and *Victorian Cities* (London, 1963); E. P. Hennock, *Fit and Proper Persons: Ideal and Reality in Nineteenth-Century Urban Government* (London, 1973); V. Skipp, *The Making of Victorian Birmingham* (Birmingham, 1983); C. Upton, *A History of Birmingham* (Stroud, 1993); E. Hopkins, *The Rise of the*

elements in the history of Birmingham and, by extension, the history of public health in Britain.

By assessing the effectiveness of the municipal response to Birmingham's sanitation problems between the 1840s and 1920s, this study re-examines the contemporary view of the city's governance and the alleged association with sanitation reform and 'municipal socialism'. Key environmental focuses are river pollution by sewage, water supply and waste management, and the impact of those problems and the council's subsequent responses on the health of the city. This thesis therefore applies a local urban study and environmental history to frame a study of public health. It explores the interrelations and importance of place, people and policy and their influence on outcomes. This thesis is inevitably underpinned by the theme of urbanisation and its problems, but some of its other themes include resistance, through the reaction to municipal responses and the nature and effectiveness of local government systems dealing with public health. It not only pays attention to those who governed but also to people who worked to promote those systems. The council employees who played key roles in the provision of health services and the design of the city's environmental infrastructure are often overlooked, but Birmingham's public health workers help to illuminate the theme of professionalisation and how it connects with class and gender. Medical knowledge and practice are also explored through an examination of Birmingham's first Medical Officers of Health (MOHs) and their influence on the health of the city and council policy.

Manufacturing Town: Birmingham and the Industrial Revolution (Stroud, 1998); T. Hunt, *Building Jerusalem: The Rise and Fall of the Victorian City* (London, 2004), pp. 232-281; R. Ward, *City-State and Nation: Birmingham's Political History c. 1830-1940* (Chichester, 2005); C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016).

The starting point for research is 1842, the year that Edwin's Chadwick's *Report on the Sanitary Conditions of the Labouring Population of Great Britain* was published.[5] Chadwick's influence 'was great', despite holding a key public health role for only a short time, but his ideas and recommendations on administration and sanitation took hold throughout the rest of the nineteenth century.[6] That same decade also saw the Health of Towns enquiry and the first Public Health Act of 1848 (a permissive act that Birmingham authorities did not embrace). However, setting the end point for this study proved more difficult. Much research focuses up to the point of the 1911 extension of the city's boundaries and subsequent reorganisation of council committees. However, many of the issues explored do not have neat end points – hence the extension in some chapters into the 1920s.

This introductory chapter frames the thesis via a literature review, followed by a section on methodology and sources, then an outline of the thesis chapters and research questions.

Literature Review

Broad general surveys offer a foundation for understanding the development of public health globally and nationally from antiquity to modern times, but it is equally important to consider developments in the historiography of public

[5] E. Chadwick, *Report on the Sanitary Conditions of the Labouring Population of Great Britain* (London, 1842).

[6] Chadwick was appointed Commissioner of the first General Board of Health created in 1848 and was dismissed in 1854. Full biographical entry by P. Mandler, 'Chadwick, Sir Edwin (1800 -1890)', *Oxford Dictionary of National Biography,* http://doi.org/10.1093/ref:odnb/5013 [accessed 17 June 2020]. See also C. Hamlin, 'Edwin Chadwick and the Engineers, 1842-1854: Systems and Anti-systems in the Pipe-and-Brick Sewers War', *Technology and Culture*, 33, 4 (1992), pp. 680-709, p. 680; P. Joshi, 'Edwin Chadwick's Self-Fashioning: Professionalism, Masculinity, and the Victorian Poor', *Victorian Literature and Culture* 32, 2 (2004), pp. 353-370, p. 367.

health.[7] Christopher Hamlin discusses the evolving definitions of what 'public health' means and the changing perspectives from 'the history of social medicine' to 'the social history of medicine'.[8] Similarly, Alex Mold *et al.* explore the changing concepts of the 'public' in 'public health' and argue that 'constructions' change 'over time and place'.[9]

The key urban and environmental histories that frame the study of public health for this thesis include Anthony Wohl's *Endangered Lives* (1983) – which remains the most comprehensive survey of sanitary conditions and responses, Bill Luckin's *Death and Survival in Urban Britain* (2015*)*, and Tom Crook's *Governing Systems* (2016) which explores the 'making of public health in England'.[10] Luckin's *Death and Survival* is a collection of previously published articles and chapters dating from between 1977 and 2006; while the original material omits much recent scholarship, the book includes a new introduction and conclusion.[11] Luckin explores disease and pollution in the city, particularly London, and his approach of intersecting the social history of medicine with the

[7] W. M. Fraser, *A History of English Public Health 1834-1939* (London, 1950); G. Rosen, *A History of Public Health*, Expanded edition (Baltimore and London, 1993); A. Wohl, *Endangered Lives: Public Health in Victorian Britain* (London, 1983); R. Porter, *The Greatest Benefit to Mankind: A Medical History of Humanity from Antiquity to the Present* (London, 1997); D. Porter, *Health, Civilisation and the State: A History of Public Health from Ancient to Modern Times* (London and New York, 1999); C. Hamlin, 'Public Health' in M. Jackson (ed.), *The Oxford Handbook of the History of Medicine* (Oxford, 2011), pp. 411-428, pp. 412, 415-417; G. Mooney, *Intrusive Interventions: Public Health, Domestic Space, and Infectious Disease Surveillance in England, 1840-1914* (Rochester, 2015); V. Berridge, *Public Health: A Very Short Introduction* (Oxford, 2016); T. Crook, *Governing Systems: Modernity and The Making of Public Health in England, 1830-1910* (California, 2016); A. Mold, P. Clark, G. Millward, and D. Payling (eds), *Placing the Public in Public Health in Post-War Britain, 1948–2012* (Cham, 2019); J. Reinarz (ed.), *A Cultural History of Medicine in the Age of Empire* (London, 2021).

[8] Hamlin, 'Public Health' in *The Oxford Handbook of the History of Medicine*, pp. 412, 415-417

[9] Mold *et al*., *Placing the Public in Public Health*, p. 7.

[10] Wohl, *Endangered Lives*; B. Luckin*, Death and Survival in Urban Britain: Disease, Pollution and Environment, 1800-1950* (London, 2015); T. Crook, *Governing Systems.*

[11] Luckin's previously published works in *Death and Survival* include: 'Evaluating the Sanitary Revolution: Typhus and Typhoid in London, 1851-1900' (1984); 'The Final Catastrophe: Cholera in London, 1866' (1977); 'The Heart and Home of Horror: The Great London Fogs of the Late Nineteenth Century' (2003); 'Unending Debate: Town, Country and the Construction of the Rural in England, 1870-2000' (2006).

city and the environment continues to influence new scholarship. This thesis draws much from Luckin's conclusion, that specific circumstances played an important role in environmental intervention and there is 'no substitute for fully contextualized accounts of the environmental histories of individual towns and cities'.[12] Wohl's *Endangered Lives* can be firmly categorised as a social and environmental history of public health, exploring the social and physical impact of rapid industrialisation and urbanisation. Wohl set the bar on what should or could be included in such an overlapping history, covering contagious and industrial disease, infant mortality, pollution, waste management and national and local administration.[13] Although similar, Crook's aim is 'to offer an understanding of modernity' and therefore make sense of the development of public health in Victorian and Edwardian England. By exploring the history of modern systems development, it inevitably encompasses the political, economic, cultural and social. Crook argues that thinking in terms of systems rather than the state (in this case the English state) can reveal interrelated levels which can encompass the international and the personal. Crook also suggests that it is perhaps the 'local' that is missing in the interrelations of governance and that any development and variation revealed offers the opportunity to rethink key features of public health.[14]

These works demonstrate that inevitably there are decisions to be taken on what can be included in such overlapping studies encompassing the environment, public health and national and local government. For example, Crook acknowledges that he is not as comprehensive as Wohl, not including

[12] Luckin, *Death and Survival*, pp. 93-117, p. 117.
[13] Wohl, *Endangered Lives*.
[14] Crook, *Governing Systems*, pp. 2, 290, 297.

vaccination, industrial health and the regulation of air, food and water.[15] The same is true for place-specific histories. However, these broader works have inspired a wealth of local studies covering single or multiple aspects encompassing the environment, urban or rural histories, sanitary reform, disease and public health. Those particularly influential to this study are discussed more fully in the subsequent relevant chapters.[16] For example, Sally Sheard makes a strong case for comparative studies with her analysis of nineteenth-century local government action in Liverpool, Belfast and Glasgow.[17] Sheard concentrates on sanitation, examining water supply, sewerage, refuse systems, and includes personal hygiene with the 'secondary sanitation' of public baths and washhouses.[18] Sheard contributes to the broader debates on decline in mortality, stressing the importance of personal hygiene. In contrast, Hamlin offers useful insight in his comparison of a selection of local sanitary projects in several British cities to provide a fuller understanding of the economic aspects of national and local public health administration.[19] More recently, Janet Sullivan

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[15] *Ibid.*, p. 21.

[16] Some examples include: M. E. Pooley and C. G. Pooley, 'Health, Society and Environment in Victorian Manchester' in R. Woods and J. Woodward (eds), *Urban Disease and Mortality in Nineteenth-Century England* (London, 1984), pp. 148-175; R. E. M. Lees, 'Epidemic Disease in Glasgow During the 19th Century', *Scottish Medical Journal,* 41, 1 (1996), pp. 24-27; B. Luckin and G. Mooney, 'Urban History and Historical Epidemiology: The Case of London 1860-1920.' *Urban History*, 24, 2 (1997), pp. 37-55; G. Macassa, A. P. De Leon, and B. Burstrom. 'The Impact of Water Supply and Sanitation on Area Differentials in the Decline of Diarrhoeal Disease Mortality among Infants in Stockholm 1878-1925', *Scandinavian Journal of Public Health,* 34, 5 (2006), pp. 526-533; K. Waddington, "'It Might Not Be a Nuisance in a Country Cottage': Sanitary Conditions and Images of Health in Victorian Rural Wales', *Rural History – Economy, Society, Culture,* 23, 2 (2012), pp. 185-204; D. Brunton, 'Regulating Filth: Cleansing in Scottish Towns and Cities, 1840-1880', *Urban History,* 42, 3 (2015), pp. 424-439; K. Waddington, '"I Should Have Thought That Wales Was a Wet Part of the World": Drought, Rural Communities and Public Health, 1870–1914', *Social History of Medicine,* 30, 3 (2016), pp. 590-611.

[17] C. I. Pennington, 'Mortality, Public Health and Medical Improvements in Glasgow 1855-1911', (Unpublished PhD Thesis, University of Stirling, 1977); S. Sheard, 'Nineteenth-Century Public Health: A Study of Liverpool, Belfast and Glasgow' (Unpublished PhD Thesis, University of Liverpool, 1993), pp. 10, 17.

[18] Sheard, 'A Study of Liverpool, Belfast and Glasgow', pp. 186-200.

[19] D. Fraser, *Power and Authority in the Victorian City* (Oxford, 1979), pp. 78-110; Hamlin did investigate Birmingham for the period 1870-2 and a sewage treatment works but concentrated on four other towns

explores the impact on public health and experience of industrialisation on the town of Oldbury in the West Midlands. Sullivan expanded into exploring morbidity with occupational disease and ill-health and the rarely addressed issue of mental health, demonstrating the expanding focus of research into health and disease and changing definitions of public health.[20]

For this urban environmental history, the focus is sanitation, set within its local political, economic and social contexts. As mentioned, this will encompass river pollution, but it is acknowledged that atmospheric pollution was also a major social and environmental problem in an industrial city like Birmingham with an abundance of different trades. However, it is an aspect deserving distinct attention and is therefore not fully explored in this thesis. Wohl's examination of 'reservoirs of poison' focuses on the central state approach to controlling river pollution through legislation and the ineffectiveness of the 1876 Rivers Pollution Act. He also introduces the establishment of drainage boards when powers were passed to local bodies.[21] Wohl suggests that after the establishment of the Thames and Lee Conservancy Boards (1857 and 1864 respectively) the next joint board was not established until 1891. However, the Birmingham Tame and Rea District Drainage Board (BTRDDB) was established in 1877. Wohl refers to a Birmingham legal case over river pollution, but Leslie Rosenthal fully explores this protracted case (1858-1895) between a local landowner and Birmingham Council for sewage nuisance of the River Tame in his later work on river

in C. Hamlin, 'Muddling in Bumbledom: On the Enormity of Large Sanitary Improvements in Four British Towns 1855-1885', *Victorian Studies*, 31, 1 (1988), pp. 55-83.

[20] J. C. Sullivan, 'Paying the Price for Industrialisation: The Experience of a Black Country Town, Oldbury in the Eighteenth and Nineteenth Centuries' (Unpublished PhD Thesis, University of Birmingham, 2014).

[21] Wohl, *Endangered Lives*, pp. 233-256, p. 237.

pollution in England.[22] Through the investigation of legal action and nuisance law Rosenthal's local case studies offer valuable insight into the difficult sanitation issues faced by localities. This thesis builds on Rosenthal's work by exploring the impact of this single case on council policy in Birmingham for almost four decades and adds to knowledge about early joint drainage boards through closer examination of BTRDDB, a separate entity from the local government, but nonetheless dominated by Birmingham Council representatives.

John Hassan has made a magisterial contribution to the study of the water industry in England and Wales, covering the 'fragmented' foundations laid in the nineteenth century in the wake of the sanitary era with the formation of private and public water supplies. [23] Hassan highlights that improved water supplies were not always a blessing if there was no effective waste management or methods of sewage treatment.[24] Glen O'Hara broadens the picture by including post-war British industry and late twentieth-century engagement with water. Although he focuses on a later period than the present study, O'Hara offers an introductory history to the water industry and provides a survey of recent scholarship.[25] By 1927 there were 361 drainage boards dealing with wastewater, but with no 'uniformity' of method.[26] Using Birmingham as a case

[22] L. Rosenthal, *The River Pollution Dilemma in Victorian England: Nuisance Law Versus Economic Efficiency* (Oxon, 2014). A legal case involving Birmingham Corporation was used as a case study, see pp. 57-90.
[23] J. A. Hassan, 'The Growth and Impact of the British Water Industry in the Nineteenth Century', *The Economic History Review* 33, 4 (1985), pp. 531-547; J. A. Hassan, 'The Water Industry 1900–51: A Failure of Public Policy?' in R. Millward and J. Singleton (eds), *The Political Economy of Nationalisation in Britain 1920-1950* (Cambridge, 1995), pp. 189-211, pp. 191-192; J. Hassan, *A History of Water in Modern England and Wales* (Manchester and New York, 1998).
[24] Hassan, 'The Growth and Impact', p. 543.
[25] G. O'Hara, *The Politics of Water in Post-War Britain* (London, 2017), pp. 1-17, 85.
[26] Hassan, 'The Water Industry 1900-51', p. 191.

study there is scope therefore to explore these fragmented foundations and the interplay between drainage boards and waterworks. Other works that explore water supply focus on politics (both nationally and locally); the development of industry infrastructure; issues of quality and quantity; and private and public ownership.[27] For instance, Vanessa Taylor and Frank Trentmann explore 'ratepayer politics' with disputes over water rates and a particular nineteenth-century case against a private water company. Taylor and Trentmann mention that there were similar disputes against municipal supplies, including Birmingham.[28] This thesis follows up that theme and explores the extent of ratepayer resistance once the water supply was municipalised in 1876 and to what extent it affected council policy.

Given recent attention to water supply in provincial towns and cities, there is now more insight into the engineering of waterworks and reservoirs: Owen Roberts, Shane Ewan and Andrew McTominey explore water schemes in Liverpool, Sheffield, Leeds and Bradford.[29] Roberts argues that initiatives for

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[27] Influential works for this study include: A. Hardy, 'Parish Pump to Private Pipes: London's Water Supply in the Nineteenth Century', *Medical History*, Supplement No. 11 (1991), pp. 76-93; B. Millward, 'Emergence of Gas and Water Monopolies in Nineteenth-Century Britain: Contested Markets and Public Control' in J. Foreman-Peck (ed.), *New Perspectives on the Late Victorian Economy: Essays in Quantitative Economic History, 1860–1914*, (Cambridge, 1991), pp. 96-124; H. Barty-King, *Water, The Book: An Illustrated History of Water Supply and Wastewater in the United Kingdom* (London, 1992); S. Sheard, 'Water and Health: The Formation and Exploitation of the Relationship in Liverpool, 1847-1900 ', *Transactions of the Historic Society of Lancashire and Cheshire*, 143 (1993), pp. 141-163; J. Broich, 'Water and the Modern British City: The Case of London, 1835-1903' (Unpublished PhD Thesis, Stanford University, 2005); D. Spar and K. Bebenek, 'To the Tap: Public Versus Private Water Provision at the Turn of the Twentieth Century', *Business History Review*, 83, 4 (2009), pp. 675-702; L. Tomory, 'The Question of Water Quality and London's New River in the Eighteenth Century', *Social History of Medicine,* 27, 3 (2014), pp. 488-507; L. Tomory, *The History of the London Water Industry, 1580-1820* (Baltimore, 2017); D. Lewis Brown, *The Elan Valley Clearance* (Eardisley, 2019); N. Higham, *The Mercenary River: Private Greed and Public Good, A History of London's Water* (London, 2022).

[28] V. Taylor and F. Trentmann, 'Liquid Politics: Water and the Politics of Everyday Life in the Modern City', *Past and Present*, 211 (2011), pp. 210-241, p. 209.

[29] O. Roberts, 'The Politics of Health and the Origins of Liverpool's Lake Vyrnwy Water Scheme, 1871-92', *Welsh History Review* 20, 2 (2000), pp. 308-335; R. Coopey, 'Politics, Imperialism and Engineering: The Construction of the Birmingham Welsh Water System, 1861–1952', in J. A. A. Jones, ed., *Water in the Celtic World: Managing Resources for the 21st Century: 2nd Inter-Celtic Colloquium, University of Wales,*

reform framed by water quality and public health emanated from local government and explores the political and ideological influences on water policy.[30] McTominey suggests that the economic aspects of waterworks management are 'sometimes neglected in environmental histories of cities'.[31] Birmingham's own water scheme, culminating with the building of dams and reservoirs in the Elan Valley, Wales was not the first scheme, but it was the most ambitiously large in scale at the end of the nineteenth century. Birmingham's civic pride in its achievement and the grand royal opening of the works in July 1904 is discussed in Roberts' exploration of commemoration and waterworks.[32] Yet, after the contemporary Birmingham council histories, there is surprisingly little detail about this major civil engineering project in the general histories of Birmingham. This project is often reduced to a few paragraphs about the passage of the 1892 Act through Parliament, the scale of the project (with images of the route of the 73-mile aqueduct) and the opening ceremony. Similarly, very little is known about Birmingham's local supply between the point of municipalisation in 1876 and before the arrival of the supply from Wales in 1904. Therefore, there are large gaps in knowledge about Birmingham's water

Aberystwyth, 3–7 July 2000 (Wallingford, 2000), pp. 375–378; S. Ewen, 'Sheffield's Great Flood of 1864: Engineering Failure and the Municipalisation of Water', *Environment and History,* 20, 2 (2014), pp. 177-207; A. McTominey, 'Bad Neighbours? Water Supply and the Civic Rivalry of Leeds and Bradford, c.1850–1887', *International Journal of Regional and Local History*, 12, 1 (2017), pp. 24-41; A. McTominey, 'The 'Leeds Lake District': Water Supply, Rural Environment, and the Cultural Landscape in Victorian and Edwardian Britain', *Cultural and Social History,* 16, 5 (2019), pp. 561-579; A. McTominey, 'Water and the Modern Engineered City: The Association of Water Engineers in a British and Transnational Context, 1896–1914', *Water History,* 12, 2 (2020), pp. 131-149; A. McTominey, "Waterworks, Municipal Government and the Environment in Twentieth-Century Britain', *Urban History,* First View (2023), pp. 1-16.

[30] Roberts, The Politics of Health and the Origins of Liverpool's Lake Vyrnwy Water Scheme', p. 309.

[31] McTominey, 'Waterworks, Municipal Government and the Environment', p. 14.

[32] O. G. Roberts, 'Waterworks and Commemoration: Purity, Rurality, and Civic Identity in Britain, 1880-1921', *Continuity and Change,* 22, 2 (2007), pp. 305-325.

supply and much to explore, such as the reaction to the Elan Valley project from ratepayers, how the project was financed and what impact it had on the city.

Crook's work is particularly influential for exploring the development of technology and the building of systems for waste management in England, as local authorities attempted to answer the 'sewage question'.[33] According to Crook, it was often the case that a chosen solution to an environmental problem could itself become contested.[34] This happened in Birmingham with the introduction of the 'pan system' from late 1873, but it is not well-known or fully understood, and therefore merits further investigation. Exploring the development of waste management systems in Birmingham offers insights into the changing perception from solution to problem. Parts of this study are similar in approach to Alan Wilson's much earlier study of sanitary systems in Manchester.[35] Both explore the use of technology and municipal decision-making, particularly in respect to conservancy systems and sewage treatments. Wilson suggests that the choice of systems 'had a profound influence on the local environment … and urban communities' and attempts to make comparisons with other English towns. However, Wilson admits that his brief accounts of Leeds and Birmingham are 'superficial and largely based on secondary sources', yet he suggests that Manchester's sanitation was reflected in Birmingham's.[36] This thesis explores this idea further, extends knowledge of the development of urban sanitation and therefore facilitates comparisons with other British towns and cities. Several other scholars also throw light on the

[33] Crook, Chapter 5: 'Matter in Its Right Place' in *Governing Systems*, pp. 148-196, 169.
[34] Crook, *Governing Systems*, pp. 173, 183.
[35] A. Wilson, 'Technology and Municipal Decision-Making: Sanitary Systems in Manchester 1868-1910' (Unpublished PhD Thesis, University of Manchester, 1990).
[36] Wilson, 'Technology and Municipal', pp. 12, 330, 353-360.

ways to approach the study of waste management and the environment, distinguishing between wet and dry systems of conservancy and methods of sewage treatment and utilisation.[37] Particularly, this is the case with John Sheail's examination of Victorian town wastes in relation to sustainability and recycling. Sheail suggests the emergence of a 'four-stage model' over the Victorian period but does not offer specific examples or a case study in a particular locality.[38] Using Birmingham's sewage crisis as a case study, this thesis looks for evidence of this model through the municipal responses to the crisis.

Turning to disease, Michael Worboys, Graham Mooney and David Barnes explore the emergence of germ theory, medical knowledge and practice covering the period from the mid-nineteenth to early twentieth centuries.[39] As a variation on this theme, Jacob Steere-Williams closely examines the practices of nineteenth-century epidemiology.[40] Worboys challenges the progressive linear view of a 'bacteriological revolution', finding instead in Britain a 'multi-

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[37] Hamlin, 'Muddling in Bumbledom'; C. Hamlin, 'Edwin Chadwick and the Engineers, 1842-1854: Systems and Anti-systems in the Pipe-and-Brick Sewers War', *Technology and Culture*, 33, 4 (1992), pp. 680-709, C. Hamlin, 'William Dibdin and the Idea of Biological Sewage Treatment'*, Technology and Culture,* 29, 2 (1988), pp. 189-218; C. Hamlin, *Public Health and Social Justice in the Age of Chadwick: Britain, 1800–1854* (Cambridge, 1998); S. Halliday, *The Great Stink of London: Sir Joseph Bazalgette and the Cleansing of the Victorian Metropolis* (Stroud, 2009); P. Atkins, 'Animal Wastes and Nuisances in Nineteenth-Century London' in P. Atkins (ed.), *Animal Cities: Beastly Urban Histories* (Farnham, 2012), pp. 19-51, pp. 42-43; I. Taylor, 'Not Going through the Motions: Sevenoaks, Sewage and Selfless Ambition, 1871–1882', *International Journal of Regional and Local History,* 9, 2 (2014), pp. 123-139; D. R. Mills, *Effluence and Influence: Public Health, Sewers and Politics in Lincoln, 1848-50 (*Lincoln, 2015).

[38] J. Sheail, 'Town Wastes, Agricultural Sustainability and Victorian Sewage', *Urban History*, 23, 2 (1996), pp. 189-210, pp. 206-207.

[39] M. Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain 1865-1900* (Cambridge and New York, 2000); D. S. Barnes, *The Great Stink of Paris and the Nineteenth-Century Struggle against Filth and Germs* (Baltimore, 2006); G. Mooney, *Intrusive Interventions: Public Health, Domestic Space and Infectious Disease Surveillance in England, 1840-1914* (Rochester (US), 2015).

[40] J. Steere-Williams, 'Edward Ballard and the Practice of Epidemiology in the 19th-Century United Kingdom', *American Journal of Public Health,* 108, 12 (2018), pp. 1632-1638; J. Steere-Williams, *The Filth Disease: Typhoid Fever and the Practices of Epidemiology in Victorian England* (Rochester (US), 2020) ; A. Webb Jr, *The Guts of the Matter: A Global History of Human Waste and Infectious Intestinal Disease* (Cambridge, 2020).

layered transitional period'. Barnes suggests, primarily with reference to the 1890s, that there was a 'sanitary-bacteriological synthesis' (SBS) with medical practitioners merging the old and new.[41] Mooney's exploration of germ practices and how they were managed – through notification, isolation and disinfection – includes Birmingham as a case study. The practice in Birmingham supports Mooney's argument that these interventions began before the rise of bacteriology. Mooney also discusses the role of Sheffield's Medical Officer of Health (MOH), Dr John Robertson, in advocating early notification for tuberculosis (TB).[42] Coincidentally, Robertson left his post at Sheffield and became Birmingham's second MOH in late 1903. As this study investigates the work of Birmingham's first two MOHs, covering the period 1872 to 1927, this thesis adds to our knowledge of Roberston and his work on the prevention and treatment of TB. Additionally, it offers further insight into the transitional period identified by Worboys and new evidence for the SBS as described by Barnes.

A wealth of statistical data arising from the Victorian implementation of registration, census and cause of death records across Europe, has been instrumental in generating debate in the last quarter of the twentieth century over the reasons for a general overall decline in European mortality by the end of the nineteenth century.[43] The data has been used to examine the impact of urbanisation and industrialisation and the effect of technological or medical advances and improved sanitation on the decline in mortality. In the 1970s, Professor of Social Medicine, Thomas McKeown, concluded that medical

[41] Worboys, *Spreading Germs*; Barnes, *The Great Stink of Paris*, pp. 134-135.
[42] John Robertson's efforts to tackle TB while MOH for Sheffield (his post before Birmingham) are discussed in Mooney, *Intrusive Interventions,* pp. 159-162.
[43] R. Schofield, D. Reher and A. Bideau (eds) *The Decline of Mortality in Europe* (Oxford, 1991).

measures had little effect on mortality and that sanitary measures accounted to some extent for the decline in water- and food-borne diseases, through a reduction in exposure to intestinal infections. He claimed that primarily it was 'improvement in nutrition that led to the decline in infectious diseases and a growth of population'.[44] The 'McKeown thesis' stimulated numerous investigations by historians, demographers and geographers to offer a variety of perspectives both national and local.[45] Simon Szreter has disputed McKeown's findings on tuberculosis deaths and his suggestion that 'municipal sanitation' was merely a secondary factor with the potential to reduce mortality rates by a quarter at best. Szreter argued that it was primarily sanitary reform that was responsible for mortality decline through reducing water- and food-borne infections. He correlated the decline in deaths with the large sums of money lent by the British government between 1858 and 1894 for local sanitary improvement projects.[46] In fact, Szreter follows the previously accepted view and offers Birmingham and Chamberlain as an exemplar of municipal socialism, with municipal trading generating funds for services.[47] Ann Hardy also challenged McKeown's view through the examination of specific diseases and concluded, like Szreter, that local government intervention for sanitary reform was an important contributor to the decline in mortality. However, Hardy also demonstrated that there were different patterns for different diseases, indicating

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[44] T. McKeown, *The Modern Rise of Population* (London, 1976), pp. 160-163.
[45] Some examples include: R. Woods and J. Woodward (eds), *Urban Disease and Mortality in Nineteenth-Century England* (London, 1984); R. Schofield, D. Reher and A. Bideau (eds), *The Decline of Mortality in Europe* (Oxford, 1991); A. Hardy, *The Epidemic Streets: Infectious Disease and the Rise of Preventative Medicine* (Oxford, 1993); S. Sheard and H. Power (eds), *Body and City: Histories of Urban Public Health* (Aldershot, 2000); S. Szreter, *Health and Wealth: Studies in History and Policy* (Rochester, 2005).
[46] S. Szreter, 'The Importance of Social Intervention in Britain's Mortality Decline c. 1850-1914: A Reinterpretation of the Role of Public Health', *Social History of Medicine*, 1 (1988), pp. 1-37, p. 22. This was later slightly revised and included as chapter 4 in S. Szreter, *Health and Wealth.*
[47] S. Szreter, 'The Importance of Social Intervention in Britain's Mortality Decline', pp. 1-37, pp. 25-26.

that sanitary reform was not the panacea for all disease. This is supported by the fact that childhood mortality remained high until the very end of the nineteenth century. Hardy also stressed that 'local preventative medicine' comprised not merely sanitary reform but also programmes of vaccination, slum clearance and education.[48] Robert Millward and Frances Bell looked closely at the investment in public health and its impact on mortality using Local Taxation Returns. They too concluded that sanitation was important but noted that the main growth in expenditure occurred at the end of the nineteenth century.[49] They also highlighted that records may show the date of expenditure but cannot indicate when 'utilities become operational' and impacted upon health.[50] However, debates continue as contributory factors for mortality decline are revisited, including the importance of nutrition.[51]

Most recently, Jonathan Chapman uses new historical data about total investment in urban infrastructure to consider its contribution to mortality decline between 1861 and 1900. Chapman argues that investment by sanitary authorities may have accounted for up to sixty per cent of the improvement in mortality rates.[52] Similarly, Bernard Harris and Andrew Hinde have expanded

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[48] Hardy, *The Epidemic Streets,* pp. 267-294; R. Woods and J. Woodward (eds), *Urban Disease and Mortality in Nineteenth-Century England* (London, 1984).
[49] F Bell and R. Millward, 'Public Health Expenditures and Mortality in England and Wales, 1870-1914', *Continuity and Change,* 13, 2 (1998), pp. 221-249.
[50] R. Millward and F. Bell, 'Choices for Town Councillors in Nineteenth-Century Britain: Investment in Public Health and its Impact on Mortality' in S. Sheard and H. Power (eds), *Body and City: Histories of Urban Public Health* (Aldershot, 2000), pp. 143-165, p. 163.
[51] S. Guha, 'The Importance of Social-Intervention in England Mortality Decline - the Evidence Reviewed', *Social History of Medicine* 7, 1 (1994), pp. 89-113. Bernard Harris revisited the nutrition debate in 2004 and later, Aleck Ostry and John Frank defended McKeown's basic theory that improvements in social conditions and nutrition were contributors, despite acknowledging the flaws in McKeown's empirical analyses; see B. Harris, 'Public Health, Nutrition and the Decline of Mortality: The McKeown Thesis Revisited', *Social History of Medicine*, 17, 3 (2004), pp. 379-407; A. S. Ostry and J. Frank, 'Was Thomas McKeown Right for the Wrong Reasons?', *Public Health,* 20, 2 (2010), pp. 233-243.
[52] J. Chapman, 'The Contribution of Infrastructure Investment to Britain's Urban Mortality Decline, 1861–1900', *The Economic History Review,* 72, no. 1 (2019), pp. 233-259.

the view of sanitary investment in England and Wales by taking into account loans from other sources rather than from central health departments. Their study includes loans through local Acts of Parliament and explores the relationship between the loans and the decline in mortality, and attempts to establish patterns of linkage. Harris and Hinde's findings suggest that there was 'not a consistent relationship between loan values and mortality change' and that further research is needed 'into the way that different local authorities used the support they obtained' and into the challenges encountered.[53] Their study formed part of a journal special issue that presents new evidence about the impact of sanitary improvements on mortality with case studies from England and Wales, Switzerland, Finland, Sweden and Australia and therefore offers an overview of recent scholarship.[54] Most recently, Toke S. Aidt *et al.* argue that previous studies have been 'seriously hampered' by the types of data available and use two different sources to explore sanitary investments and their contribution to mortality decline between 1845 and 1909; capital expenditures on water and sewerage by urban authorities and weekly counts of deaths in the largest English towns. The findings of this study suggest early effects of clean water and late effects of sewerage on mortality, and a need for greater attention to the sequencing of sanitary investment. Also noted is a link with the 'abundance' of water to reinforce effectiveness of sewerage systems.[55] This thesis, exploring sanitation and the development of utilities in England's second

[53] B. Harris and A. Hinde, 'Sanitary Investment and the Decline of Urban Mortality in England and Wales, 1817–1914', *The History of the Family* 24, 2 (2019), pp. 339-376, p. 369.
[54] B. Harris and J. Helgertz, 'Urban Sanitation and the Decline of Mortality,' *The History of the Family,* 24, 2 (2019), pp. 207-226.
[55] T. S. Aidt, R. J. Davenport, and F. Gray, 'New Perspectives on the Contribution of Sanitary Investments to Mortality Decline in English Cities, 1845–1909', *The Economic History Review* 76, no. 2 (2023), pp. 624-660, pp. 624-625, 656-657.

largest city, provides additional knowledge and insights and contributes to these debates surrounding urban sanitation, infrastructure investment and the decline of mortality. As Birmingham council used local Acts of Parliament for sanitary investment, as suggested by Harris and Hinde, it explores more closely the support and challenges faced by one local authority.

As is well-known, much of the McKeown thesis has been refuted due to flaws in his analyses of the decline of tuberculosis and age-specific mortality, and his dismissal of fertility as a factor in population growth. [56] Szreter and Hardy highlight the pitfalls of using the Registrar-General's statistical data which was McKeown's main source, and Mooney explains the contemporary difficulties and tensions between the Registrar-General's Office and local public health administration over mortality rates.[57] Even before the problems were highlighted, Robert Woods recommended the use of local MOH reports and used this source for his own investigation of mortality and sanitary conditions in Birmingham.[58] Bill Luckin and Graham Mooney agreed that local MOH reports offer a more realistic epidemiological picture as well as valuable information on local variables affecting epidemics, immigration trends and any changes to the social and physical environment through local government policies.[59] Although Woods used mortality statistics in his work and contributed much to the history

[56] For instance, see E. A. Wrigley and R. S. Schofield, *The Population History of England 1541-1871* (Cambridge, 1981).
[57] S. Szreter, 'The GRO and the Public Health Movement in Britain 1837-1914', *Social History of Medicine,* 4, 3 (1991), pp. 435-463, p. 458; G. Mooney, 'Professionalization in Public Health and the Measurement of Sanitary Progress in Nineteenth Century England and Wales', *Social History of Medicine,* 10, 1 (1997), pp. 53-78; A. Hardy, '"Death Is the Cure of All Diseases": Using the GRO Cause of Death Statistics 1837-1920', *Social History of Medicine,* 7, 3 (1994), pp. 472-492.
[58] R. Woods, 'Mortality and Sanitary Conditions in the "Best Governed City in the World" – Birmingham, 1870-1910, *Journal of Historical Geography*, 4, 1 (1978), pp. 35-56.
[59] B. Luckin and G. Mooney, 'Urban History and Historical Epidemiology: The Case of London 1860-1920.' *Urban History*, 24, 2 (1997), pp. 37-55.

of geographical mortality patterns, he later suggested that 'direct attention' to an environment where the administrative history was well documented would be another approach.[60] Similarly, Szreter reflected later that it was the 'million Minutes' in local government in the last quarter of the nineteenth century that have been missing from previous accounts of mortality decline.[61] This suggests the importance of concentrating on local sources, as in this thesis, to help inform broader questions.

Despite the lack of a detailed historiography of sanitation in Birmingham, other studies have examined specific aspects of public health in the city. In addition to Woods, Wilson and Mooney, there are studies investigating the local response to the threat of a cholera epidemic, the prevention of tuberculosis through the milk supply, and the impact of social interventions on infant mortality.[62] Additionally, Marjaana Niemi's study compares Birmingham and Gothenburg in terms of municipal policy making, for addressing urban problems and public health in the early twentieth century. Niemi contextualises the socio-economic make-up of Birmingham as well as the national setting to illuminate contemporary public health strategies.[63] However, despite offering a

[60] R. Woods, 'Public Health and Public Hygiene: The Urban Environment in the late Nineteenth and Early Twentieth Centuries' in R. Schofield, D. Reher, D. and A. Bideau (eds), *The Decline of Mortality in Europe* (Oxford, 1991), pp. 233-247, p. 247.
[61] Szreter, *Health and Wealth,* p. 124.
[62] R. Woods, 'Mortality and Sanitary Conditions in the "Best Governed City in the World", pp. 35-56; M. Niemi, 'Public Health Discourses in Birmingham and Gothenburg 1890-1920' in S. Sheard and H. Power (eds), *Body and City: Histories of Urban Public Health* (Aldershot, 2000), pp. 123-142;; M. Niemi, *Public Health and Municipal Policy Making: Britain and Sweden, 1900–1940* (Aldershot, 2007); R. J. Procter, 'Infant Mortality: A Study Of The Impact Of Social Intervention In Birmingham 1873 To 1938', (MPhil, University of Birmingham, 2011); I. Cawood and C. Upton, '"Divine Providence": Birmingham and the Cholera Pandemic of 1832', *Journal of Urban History,* 39, 6 (2013), pp. 1106-1124; J. Wacher, "'Lessening Our Greatest Scourge": Management of the Tuberculosis Milk Problem in Birmingham at the Turn of the Nineteenth Century', *Midland History*, 33, 1 (2013), pp. 115-130.
[63] Niemi, 'Public Health Discourses in Birmingham and Gothenburg 1890-1920; Niemi, *Public Health and Municipal Policy Making.*

comprehensive overview of Birmingham council's campaigns against infant mortality and TB, no consideration is given to any motivating ideas and influences behind the policy making itself. Niemi's study covers a period when eugenic thinking and ideas were prevalent and yet these are not discussed.[64] This thesis addresses that omission and presents new evidence for understanding municipal policy making and why different solutions to urban problems were adopted by different towns and cities.

This review has shown the overlapping of urban environment histories with the social history of medicine and how these have been used in a variety of ways to frame and study public health reform, death and disease, and medical knowledge and practice. These overlapping strands demonstrate the importance of the 'local level', as advocated by Woods, Szreter, Luckin and Crook. Mooney and Willams conclude in their investigation of the decline in infant mortality in English cities, that the reasons for the decline (or not) were often a 'particular combination of social, economic and environmental circumstances'.[65] This thesis therefore offers a contextualised environmental history of sanitation in Birmingham in the nineteenth and early twentieth centuries through exploration of those circumstances. As a local urban history, it fills gaps in knowledge by adding to the historiography for understanding the social and political history of the city. It challenges some long-held views and throws new light on the living environment for some of the poorest residents of Birmingham, in the courts of back to backs. It also contributes to broader

[64] For a more detailed discussion on the quality of population, family welfare, eugenics and social policy, see D. Porter, *Health, Civilization and The State: A History of Public Health from Ancient to Modern Times* (London and New York, 1999), pp. 165-195.
[65] N. Williams and G. Mooney, 'Infant Mortality in an 'Age of Great Cities': London and the English Provincial Cities Compared, c. 1840-1910,' *Continuity and Change,* 9, 2 (1994), pp. 185-212, p. 208.

debates surrounding mortality decline, the development of the water industry in England and Wales, and local government and the work of public health. This fuller contextualisation can then be used to explore the effectiveness of municipal responses as a basis for for any future study of Birmingham or more broadly of the history of sanitation and public health.

Methodology and Sources

As István Szijártó suggests, the one advantage of a microhistorical approach is that it can present a 'diversity of contexts within the frame of a relatively limited investigation'.[66] John Tosh suggests that politically, local history offers the opportunity to look beyond the central state and examine 'the assertion of authority over ordinary people'.[67] This study is a microhistory examining a single local authority but it goes deeper. In the same way that a microscope can keep increasing magnification to see something smaller within, this examination drills down to single committees, to individual sections and to specific roles and individuals. The characteristics of microhistory are considered most suited to this investigation due to the detailed focus on one place, with a greater stress on agency revealing the actors, with the objective to inform on larger questions.[68] This methodology allows this study to address the need for greater

[66] I. Szijártó, 'Four Arguments for Microhistory', *Rethinking History*, 6, 2 (2002), pp. 209-215, p. 211; J-P. A. Ghobrial, 'Introduction: Seeing the World Like a Microhistorian', *Past and Present*, Supplement 14 (2019).
[67] J. Tosh, *The Pursuit of History*, 5th Edition (Harlow, 2010), pp. 82-83.
[68] T. Robisheaux (ed.), 'Microhistory Today: A Roundtable Discussion', *Journal of Medieval and Early Modern Studies*, 47, 1 (2017), pp. 7-52, pp. 9-10.

contextualisation, as identified by Crook, Luckin, and by Williams and Mooney, Pooley and Pooley, and Woods.[69]

This historical investigation involves a close analysis of primary sources. Those produced by the local authority are key: the minute books and printed reports of the various committees and sub-committees relating to health, water supply and waste management. The Birmingham City Council Archive (BCC) is held by Birmingham Archives and Collections (BAC), Library of Birmingham.[70] An important primary source were the minute books of the Borough Inspection Committee (subsequently renamed Sanitary; Health; Public Health and Housing) as their mandate and functions expanded. This lead committee also oversaw sub-committees for various internal departments. Analysis did not rely solely on the printed council sources as it is preferable to examine the unedited manuscript versions. Often, other useful material was inserted into the pages of minute books, including copy correspondence, newspaper cuttings and extracts from other printed sources. Although a rich and extensive source, records may be selective and edited, thus offering a partial or biased perspective. This analysis was supplemented with examination of some of the earliest histories of the council.[71] They can be considered early secondary sources, as they are essentially a chronological and departmental history constructed from council minutes. However, they are also valuable primary sources as contemporary

[69] Pooley and Pooley, 'Health, Society and Environment in Victorian Manchester', pp. 148-149; Woods, 'Public Health and Public Hygiene: The Urban Environment in the late Nineteenth and Early Twentieth Centuries', p. 247; Williams and Mooney, 'Infant Mortality in an 'Age of Great Cities', p. 208; Luckin, *Death and Survival*, p. 117.

[70] Birmingham Archives and Collections, Library of Birmingham (BAC), Birmingham City Council Collection (BCC).

[71] J. T. Bunce, *History of the Corporation of Birmingham, Vol. I* (Birmingham, 1878); J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885); C. A. Vince*, History of the Corporation of Birmingham, Vol. III* (Birmingham, 1902); C. A. Vince, *History of the Corporation of Birmingham, Vol. IV* (Birmingham, 1923); J. T. Jones, *History of the Corporation of Birmingham, Vol. V* (Birmingham, 1940).

publications and have been used as such throughout this study. They too have the limitation of a biased perspective, as the authors were involved or associated with the council and the publications were commissioned by the council. The records of Birmingham Council in relation to the water supply are not actually held within the BCC collection (although there is a reference to them); instead they are held in the Severn Trent Water Collection also held at BAC. This collection is not searchable through the library online catalogue, but a list of material is available in the reading room.[72] The fact that Severn Trent took over as the water authority in 1974 may in part explain why the historiography is scant on Birmingham's water supply.

The other major source is the annual reports of the MOH of Birmingham, with some original copies available at BAC but digital copies were accessed online through the Wellcome Library.[73] This rich source provides information on disease and mortality in Birmingham and on sanitation improvements, housing issues, sanitary surveys and food and water analyses. The reports are valuable for their place-specific contextual information such as weather conditions, prevalent epidemics in a particular year, and any experimental trials. However, they offer little information on morbidity and therefore cannot present a complete picture of the health of the city, such as those living with chronic disease or incapacitated through industrial accidents. Other local printed and unpublished sources were vital to offer a more complete picture. These included books, local association minutes, pamphlets, scientific addresses, local newspapers and trade directories available at BAC and the Cadbury Research

[72] BAC, Severn Trent Water Collection, MS 944.
[73] *Wellcome Library* (2021) https://wellcomelibrary.org/moh/about-the-reports/about-the-medical-officer-of-health-reports/

Library Special Collections (CRLSC) at the University of Birmingham. Additional supplementary materials (books, pamphlets, journal articles and conference papers) were also analysed to provide national context and present contemporary theories, medical knowledge and practices. This was important to place council individuals and medical practitioners, who were instrumental in influencing policy and developing systems, within their appropriate cultural context. Also, for public health workers, the examination of papers produced by female employees helped to address the gender imbalance in histories as most sources were produced by middle-class, professional men.

Local archives hold a wealth of material that record the theories and practice of public health, science and technology, as well as documenting the reactions of people to the changing urban environment. A survey of local studies indexes (not online) at the Library of Birmingham revealed rich material covering sanitation, water supply, health and disease, and engineering and technology, including sources produced by council members and MOHs as well as local engineers. Other sources that proved valuable to this study include a previously unused memoir by a Birmingham sanitary inspector, which offers a working-class perspective, and the annual reports of the Birmingham Heredity Society (formed in 1910) offering insight into the influence of eugenic ideas on members of the council. Consulting the multitude of maps held at the Library helped to construct a geographical picture of contemporary Birmingham and to gain understanding of co-existing parish, borough, district and ward systems, the surrounding authorities and later extension of Birmingham’s boundaries. Also particularly valuable were online newspaper and genealogical databases for context and information on individuals, particularly for Chapter Seven and

the Index of Persons (see Appendix 1). Awareness of the political biases of local newspapers was important for analysis and it is crucial to consider how a particular issue was reported in more than one local newspaper. Archive projects also proved useful, including a local Friends of Birmingham Archives and Heritage (FoBAH) project exploring maternity and infant services in the early twentieth century.[74] Also useful is an archive cataloguing project by Bath Record Office, funded by the Wellcome Trust, *Building a Healthier City.* The output from this project in the form of lunchtime talks offered an opportunity to make comparisons with the development of water supply for towns and cities.[75]

Research visits to the dams and reservoirs of the Elan Valley in mid-Wales and other heritage sites also proved valuable. Other site visits included the last remaining back-to-back housing in Birmingham, now in the care of the National Trust; a preserved Victorian sewage treatment plant at Claymills in Burton upon Trent; a former water pumping station in Lichfield, Staffordshire where a group of volunteers is dedicated to preserving this disused Victorian example and its 150-year-old beam engine; and the Waterworks Museum in Hereford, full of material culture relating to the supply of water. All site visits assisted in developing a sense of scale and insight into contemporary technology and practices.[76]

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[74] Friends of Birmingham Archives and Heritage (FoBAH), *Born in Birmingham: Maternity, Midwives and Infant Welfare 1914-1924* (Birmingham, 2021). This is the output of a local project supported by a National Lottery Heritage Fund First World War: then and now grant (2019-2020). Volunteers and FoBAH committee members used collections held at BAC and produced a learning guide for researching maternity services and infant welfare issues in Birmingham 1914-1924.

[75]Bath Record Office and Local Studies, *Building a Healthier City* (Bath and North East Somerset Council, 2021) https://www.batharchives.co.uk/building-healthier-city-funded-wellcome-trust [accessed 21 November 2020].

[76] Elan Valley Visitor Centre is located in the Elan Village, Rhayader, Powys, Wales https://elanvalley.org.uk/visit/visitor-centre/ ; National Trust, Birmingham Back to Backs https://www.nationaltrust.org.uk/visit/birmingham-west-midlands/birmingham-back-to-backs ; Claymills

Thesis Structure and Research Questions

This thesis examines municipal responses to Birmingham's environmental sanitation problems and explores how effective those responses were to address public health and pollution issues. Chapter Two is partly contextual and explores the environmental and public health situation in Birmingham between 1842 and 1872. In addressing the key research question to explore the motivations for change, it identifies both internal and external factors and pinpoints a watershed moment. There is discussion of previously little-considered environmental and meteorological factors, as well as of the impact of a public health and social reform congress hosted in Birmingham.

Chapter Three concentrates on the changing composition of Birmingham's local government between the late 1860s up to the 1890s. Key research questions consider why sanitation and municipal socialism were so linked to the council and Joseph Chamberlain, and whether this linkage was justified. The chapter also tests the validity of a supposed 'Liberal golden age' in the city, culminating in a reputation for its governance.[77] It looks at the influence of the 'civic gospel' and local acts of municipalisation (with a greater focus on water supply than gas) and how this period is remembered in the city.[78] It also explores the theme of resistance and Birmingham ratepayers' long-standing opposition to a piped water supply.

Victorian Pumping Station museum and archive http://www.claymills.org.uk/; Sandfield Pumping Station is in the care of the Lichfield Waterworks Trust https://lichfieldwaterworkstrust.co.uk/ ; Waterworks Museum – Hereford https://www.waterworksmuseum.org.uk/ [all website links as at December 2023].

[77] R. Ward, 'Birmingham: A Political Profile, 1700-1940' in C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 159-191, pp. 171-174.

[78] Briggs, *Victorian Cities,* pp. 184-240.

Chapter Four is devoted to the municipal response to river pollution from Birmingham's sewer outfall works at Saltley.[79] Building on the work of Rosenthal, it begins to explore the impact of the Adderley v Corporation case that began in 1858 and Birmingham's subsequent sewage crisis of 1871-2.[80] This chapter looks at the question of how effectively the council addressed environmental pollution and assesses to what extent the issue hindered sanitation development in Birmingham. The formation and development of a local joint drainage board and the various prevalent sewage treatment methods offer insights into the beginnings of the water industry. The chapter searches for evidence of Sheail's four-stage model and explores themes of utilisation and recycling across both wet and dry waste management systems and highlights the important contribution of engineers employed by local authorities and drainage boards. In agreement with Henry Irving's view that urban history can 'encourage critical understanding of the present', the chapter closes with parallels being drawn with present-day sewage treatments and environmental issues.[81]

The city's water supply is the focus of Chapter Five which investigates the extent to which Birmingham Council effectively dealt with issues of quantity and quality once the supply was municipalised. Attention is given to the previously little-explored period between 1876 to 1904, when the municipal supply was totally reliant on local surface sources and deep wells, while also considering

[79] Chapter Four focuses specifically on river pollution through the deliberate discharge of sewage directly into rivers and the treatment of sewage on the land. Agricultural and industrial practices also pollute rivers, but this is not discussed in detail in this chapter.
[80] Rosenthal, *The River Pollution Dilemma,* pp. 57-90.
[81] H. Irving, 'The War on Waste: Using Urban History to Inspire Behavioural Change', *Urban History*, 48 (2021), pp. 307-319.

the priorities of operation for an expanding urban industrial city. The chapter closely examines the council's ambitious Elan Valley Water Scheme and the motivations for the Birmingham Water Act 1892. The theme of resistance is also explored with reference to the financial plan proposed by the council for this major civil engineering project. It attempts to determine precisely how important municipal ownership was to the development of Birmingham's water supply, a concern motivated in part by present-day debates over private or public ownership of water companies.

The municipal responses to the environmental sanitation issues went beyond policy change and expansion of municipal infrastructure. They brought transition from well to pipes and the development of new waste management systems, affecting many citizens of Birmingham. The decision to adopt a new privy pan conservancy system, labelled 'interception', particularly impacted those who lived in Birmingham's courts of back to backs. The research question of Chapter Six is to establish to what extent and how a municipal water supply and the council's new waste management systems impacted the living environment and health of Birmingham's back-to-back inhabitants. Through examination of the practice of the interception system by the council's workforce and analysis of the MOH annual reports, this chapter attempts to present the lived experience of inhabitants.

Chapter Seven moves away from environmental sanitation problems and looks at the development of a municipal public health department to meet growing compulsory obligations. It explores expansion in terms of workforce and costs in the first decades of the twentieth century. The focus is upon the male and female workers of the sanitary section, in particular the roles of inspector and

health visitor. By identifying certain individuals who worked in this department, their contribution helps to explore the theme of professionalisation, within the context of changing theories of disease and medical knowledge. One research question of the chapter considers to what extent class and gender affected career advancement and qualifications, job titles and levels of pay within Birmingham's Public Health Department.

Chapter Eight continues to concentrate on the city's Public Health Department, but the focus is on the role of MOHs. There were two appointments for Birmingham for the period covered by this thesis: Dr Alfred Hill (MOH,1872-1903) and Dr John Robertson (MOH,1903-1927). The chapter locates them within their context of medical education, knowledge, and advancements in and greater understanding of the causes and spread of disease. The research question considers to what extent Birmingham's MOHs were able to influence the council's public health policies. It challenges some previous assessments of their social interventions to tackle infant mortality and looks for evidence of Barnes's SBS by exploring the influence of scientific ideas and movements such as social hygiene and eugenics.[82]

Finally, Chapter Nine draws together the findings from the previous chapters, highlights the wider significance of the thesis and comes to conclusions on the two main overarching research questions. It reappraises the effectiveness of Birmingham's municipal responses against key environmental and social problems, and evaluates whether the reputation of the council and Chamberlain, so linked to sanitation in the 1870s and 1880s, is justified. It

[82] Barnes, *The Great Stink of Paris*, pp. 134-135.

concludes with discussion on the implications of the findings for the existing historiography and identifies potential avenues for further research.

Chapter Two

A Midden Town: Birmingham 1842 - 1872

In 1845, Robert Slaney, one of the commissioners enquiring into the state of large towns, noted that parts of Birmingham were filled with 'courts with pigs, middens and open privies and bad water'.[1] Despite this, Slaney began his report describing Birmingham as 'perhaps one of the most healthy of our large towns' with the benefit of good drainage and porous soil. The principal streets were well drained, and the homes of the wealthier and middle classes were described as 'dry and airy'. In common with other towns, Slaney made clear distinctions between the different areas inhabited by the wealthier and poorer classes,[2] noting that earlier public works in Birmingham had concentrated in the areas where local ratepayers lived or had their businesses.[3]

Building on Christopher Hamlin's suggestion that 'cholera forcing' motivation is far too simplistic an explanation for public health improvements, Bill Luckin and Matthew Newsom Kerr nevertheless discuss how cholera and other epidemics provoked a

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[1] Parliamentary Papers (PP), Commissioners for Inquiring into the State of Large Towns and Populous Districts, *Second Report of Commissioners of Inquiry, Minutes of Evidence, Appendices* (1845), Command Papers, (602 610), xviii.i, 299, see Appendix to Second Report, pp. 1-2. Robert Slaney was a politician, elected as MP for Shrewsbury and an active commissioner on the health of towns. He was known for his concern about the conditions of the poorer classes. For full biographical entry, see E. Clarke (revised by H. C. G. Matthew), Slaney, Robert Aglionby (1792-1862), *Oxford Dictionary of National Biography (ODNB)* http://doi.org/10.1093/ref:odnb/25713 [accessed 17 June 2020]. Birmingham was often referred to as a 'midden town'; see Birmingham Archives and Collections, Library of Birmingham (BAC), L.45.4.2107, *Report of the Sewage Inquiry Committee* (Birmingham, 1871), p. xi. A midden (or ashpit or bog hole as it was commonly referred to in Birmingham) was a form of 'dry' waste management for household waste and human waste from privies (ashes and other matter was used to soak the faecal matter); these were left exposed to the air and were rarely emptied (commonly overflowing) and were often located right next to buildings. Also see D. Eveleigh, *Privies and Water Closets* (Oxford, 2008).

[2] State of Large Towns, *Appendix to Second Report State of Large Towns,* pp. 1-2.

[3] M. Sigsworth and M. Worboys, 'The Public's View of Public Health in Mid-Victorian Britain', *Urban History,* 21, 2 (1994), pp. 237-250, p. 241-242.

wave of investigations and reports on large towns throughout the 1840s, a phenomenon that had subsequent socio-political implications.[4] There were several reports on Birmingham: one as part of Edwin Chadwick's influential *Report on the Sanitary Conditions of the Labouring Population of Great Britain* (1842); another was the result of a commission enquiry; and there was also a local report to the General Board of Health, established under the 1848 Public Health Act (PHA).[5] They were all similar in their environmental approach, reviewing the town through the lens of its geological features, housing, water supply, drainage, sewage and prevalent diseases. The appearance of cholera in 1831-2 and high numbers of deaths within many large towns generated interest in urban conditions and disease. As Ian Cawood and Chris Upton point out, Birmingham differed in that its first cholera outbreak resulted in just twenty-four reported deaths.[6] This peculiarity made Birmingham interesting: specifically, why had it been more fortunate than, for

[4] C. Hamlin, '"Cholera Forcing": The Myth of the Good Epidemic and the Coming of Good Water', *American Journal of Public Health*, 99, 11 (2009), pp. 1946-1954; B. Luckin, *Death and Survival in Urban Britain: Disease, Pollution and Environment, 1800-1950* (London, 2015), pp. 31-34; M. Newsom Kerr, 'Environment' in J. Reinarz (ed.), *A Cultural History of Medicine in the Age of Empire* (London, 2021), pp. 31-62, p. 46. Newsom Kerr refers to earlier works by R. J. Evans, 'Epidemics and Revolutions: Cholera in Nineteenth-Century Europe', *Past & Present*, 120 (1988), pp. 123-46; C. Hamlin, *Cholera: The Biography* (New York: Oxford University Press, 2009); T. Crook, *Governing Systems: Modernity and the Making of Public Health in England, 1830-1910* (California, 2016), pp. 23-62.

[5] The Slaney report on Birmingham formed part of the Royal Commission for Inquiring into the State of Large Towns and Populous Districts (see f/n 1); PP, Commissioners on the Sanitary Condition of the Labouring Population of Great Britain: *Local Reports on England*, House of Commons Papers (007), xxvii, 1842 [hereafter *Local Inquiry Reports for Birmingham]*; Chadwick, *Report on the Sanitary Conditions of the Labouring Population of Great Britain* (London, 1842); and R. Rawlinson, *Report to the General Board of Health on a Preliminary Inquiry into the Sewerage, Drainage and the Supply of Water and the Sanitary Condition of the Inhabitants of the Borough of Birmingham* (London, 1849) hereafter *1849 Report on Birmingham*.

[6] I. Cawood and C. Upton, '"Divine Providence": Birmingham and the Cholera Pandemic of 1832', *Journal of Urban History,* 39, 6 (2013): pp. 1106-1124, p. 1106.

example, Bilston in the Black Country, one of the worst affected towns in England, with over 700 deaths in each outbreak in 1832 and 1849?[7]

There is very little historiography on public health in Birmingham before 1872.[8] Equally, there is little detail on Birmingham's sanitation and municipal responses between the 1850s and 1860s, except for Victor Skipp's short discussion of public health and utilities.[9] Other social and political histories of the town tend to focus primarily on the 1840s (due to the plethora of reports) before leapfrogging directly to the period 1873-6 with the mayoralty of local politician, Joseph Chamberlain, and the passing of the 1875 PHA.[10]

Anthony Wohl and Tom Crook both discuss public health, the sanitary movement and the environmental sanitary conditions across many British towns, but as Crook and Luckin suggest, fully contextualised accounts of individual towns and authorities offer greater insight.[11] Hence, this chapter explores the period between 1849 up to the point of the 1872 PHA, when greater responsibility was placed upon local authorities. It fills the historiographical gap and offers insight into the impact of rapid urbanisation and industrialisation on the physical environment. The research aim is to identify motives for change and to pinpoint a significant watershed moment. Was it only when

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[7] S. Briercliffe, '"Slums" of the Black Country: Quarry Lane, Bilston', [Blog] 19 Oct 2015, *Simon Briercliffe* (2013-2022) https://simonbriercliffe.com/2015/10/19/slums-of-the-black-country-quarry-lane-bilston [accessed 25 March 2023].

[8] J. Reinarz, 'Industry and Illness: Investing in Health and Medical Provision' in C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 239-259, p. 253.

[9] V. Skipp, *The Making of Victorian Birmingham* (Birmingham, 1983), pp. 87-104.

[10] For more about Joseph Chamberlain, see A. Briggs, *Victorian Cities* (Middlesex, 1963), pp. 184-240; Skipp, *Making of Victorian Birmingham*, pp. 87-91; C. Upton, *A History of Birmingham* (Stroud, 1993), pp. 135-141; T. Hunt, *Building Jerusalem: The Rise and Fall of the Victorian City* (London, 2004), pp. 313-380; R. Vinen, *Second City: Birmingham and the Forging of Modern Britain (*London, 2022), pp. 65-74, 96-99. Also see Appendix 1: Index of Persons.

[11] A. Wohl, *Endangered Lives: Public Health in Victorian Britain* (London, 1983); Crook, *Governing Systems*. Also, Luckin, *Death and Survival*, p. 117.

forced to do so by the national legislation of the 1870s or was local government already moving towards sanitation and public health reform before then? Drawing some inspiration from the sanitary reports and what Chadwick considered 'sanitary science', this chapter begins by examining housing and living conditions and waste management.[12] It goes on to cover water supply, exploring issues of quantity and quality and the impact of climate and pollution and their socio-political implications. Its scope then broadens to consider national approaches to pollution and the impact of the sanitary reform movement on Birmingham and local government.[13]

Housing and Living Conditions

In common with all towns and cities, class, occupation and income determined the type of property citizens lived in. Eric Hopkins explored the development of working-class housing in Birmingham and the results of building projects in the town between 1760 and 1840 (a peak period of industrialisation and urbanisation), and the results are contained in those sanitary reports of the 1840s, which describe the villa, cottage and back-to-back type housing.[14] One noted benefit of living in Birmingham, in contrast to Manchester and Liverpool, was that there were 'no cellar dwellings'.[15]

In the eighteenth century the wealthier classes lived in the centre of the town, close to their businesses and amenities, but as the town industrialised and more labour

[12] Finer (1952) cited in P. Joshi, 'Edwin Chadwick's Self-Fashioning: Professionalism, Masculinity, and the Victorian Poor', *Victorian Literature and Culture* 32, 2 (2004), pp. 353-370, p. 367.
[13] L. Goldman, *Science, Reform and Politics in Victorian Britain: The Social Science Association 1857-1886* (Cambridge, 2002).
[14] E. Hopkins., 'Working-Class Housing in Birmingham During the Industrial Revolution', *International Review of Social History,* 31, 1 (1986), pp. 80-94.
[15] Hopkins, 'Working-Class Housing', p. 84.

moved in, the wealthy moved out to suburban areas such as Edgbaston. The wealthier elite classes lived in mansions and villas,[16] whilst the more middling classes lived in better-quality terraced housing with rentals that ranged between £60 and £150 per annum. Water supply to the home came from private shallow wells, possibly supplemented with a piped supply with only the wealthiest having water closets (WCs). Despite the superior private facilities of villas and mansions, the overall sanitation provisions were poor: there was a lack of public sewers and WCs discharged into open ditches alongside the road or into dumb wells.[17]

Cottages or 'two up, two down' properties were situated around the town and typically provided a better class of accommodation for a single family, being mostly rented by artisans and skilled workers.[18] For example, properties in Bridge Street were available for five shillings a week with a private garden, washhouse, privy and cesspool, but they too lacked sewerage and the cesspools were often located very close to the well (see Fig. 2.1).[19]

[16] P. Ballard, 'A Commercial and Industrial Elite: A Study of Birmingham's Upper Middle Class 1780-1914' (Unpublished PhD Thesis, University of Reading, 1983); J. Berry, 'People and Place in Moseley: A Middle-Class Birmingham Suburb, 1850-1900' (Unpublished PhD Thesis, University of Birmingham, 2021).
[17] Rawlinson, *1849 Report on Birmingham*, pp. 25-26; Skipp, *Making of Victorian Birmingham*, pp. 74-85.
[18] Skipp, *Making of Victorian Birmingham*, pp. 77, 80-82.
[19] Bridge Street is located right in the heart of the city centre off Broad Street, close to Gas Street Basin. See Ward 10, St. Thomas's, in Drake's 1840 Map of Birmingham Divided into Wards, p. xi of this thesis.

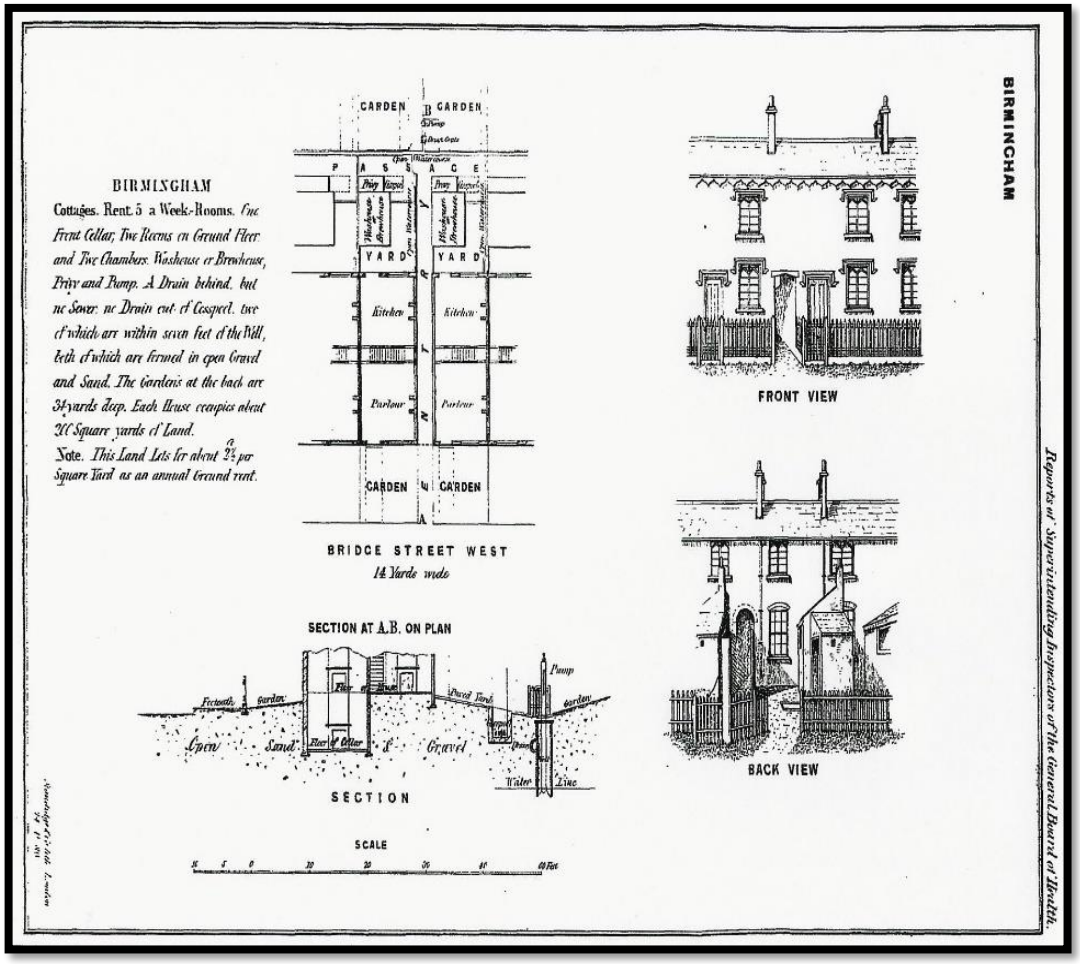


Figure 2.1: Plan of Cottage Style Houses, Bridge Street West Birmingham 1849

From R. Rawlinson, *Report to the General Board of Health on a Preliminary Inquiry into the Sewerage, Drainage and the Supply of Water and the Sanitary Condition of the Inhabitants of the Borough of Birmingham* (London, 1849), p. 25.

Back-to-Backs and Lodging Houses

Most of the poorer working classes could not afford cottages, so home was in one of the courts of back to backs, with rents of between two and three shillings a week. Joanne Harrison, in her study of back-to-back houses in Leeds, has traced the origins of this type of housing to the eighteenth-century midland and northern

industrial towns.[20] Although there were slight variations, the general design featured houses built either side of a party wall, with the front wall having windows and door (hence back-to-back) facing inwards across a courtyard that could be accessed at only one or two points.[21] In Birmingham this type of housing comprised two or three stories and consisted of a small scullery and one main room downstairs, with two small bedrooms on the second floor and an attic on the third.[22] Each house was small and arranged around courtyards with all the surrounding properties sharing a source of water and a small number of communal brewhouses, privies and ashpits as in a plan of courts in Birmingham (Fig. 2.2). Back-to-back housing maximised space, as the demand for housing increased, they were slotted in on any land close to the centre of town, amidst the workshops, manufactories and slaughterhouses.[23]

Tenements and lodging-houses were types of accommodation where one room within a converted house was rented by a family by the night or week. In others, a bed in a room full of other people could be obtained for about sixpence a night. This type of property could be situated within the courts but also in the large older houses of the wealthier classes in the centre of town. If they were no longer occupied by a single wealthy family, they were divided up for maximum occupancy and rents. Both the Rawlinson and Chadwick reports associated this type of housing with the 'lowest

[20] J. Harrison, 'The Origin, Development and Decline of Back-to-Back Houses in Leeds, 1787–1937', *Industrial Archaeology Review,* 39, 2 (2017), pp. 101-116, p. 101.
[21] *Ibid*., p. 101.
[22] C. Chinn, *Homes for People: 100 Years of Council Housing in Birmingham* (Birmingham, 1991); C. Chinn, *Poverty Amidst Prosperity: The Urban Poor in England, 1834-1914* (Manchester, 1995), pp. 82-83.
[23] Skipp, *Making of Victorian Birmingham*, pp. 82-83.

class of person' and made moral judgements about the inhabitants rather than the landlords who profited from letting such poor accommodation.[24]

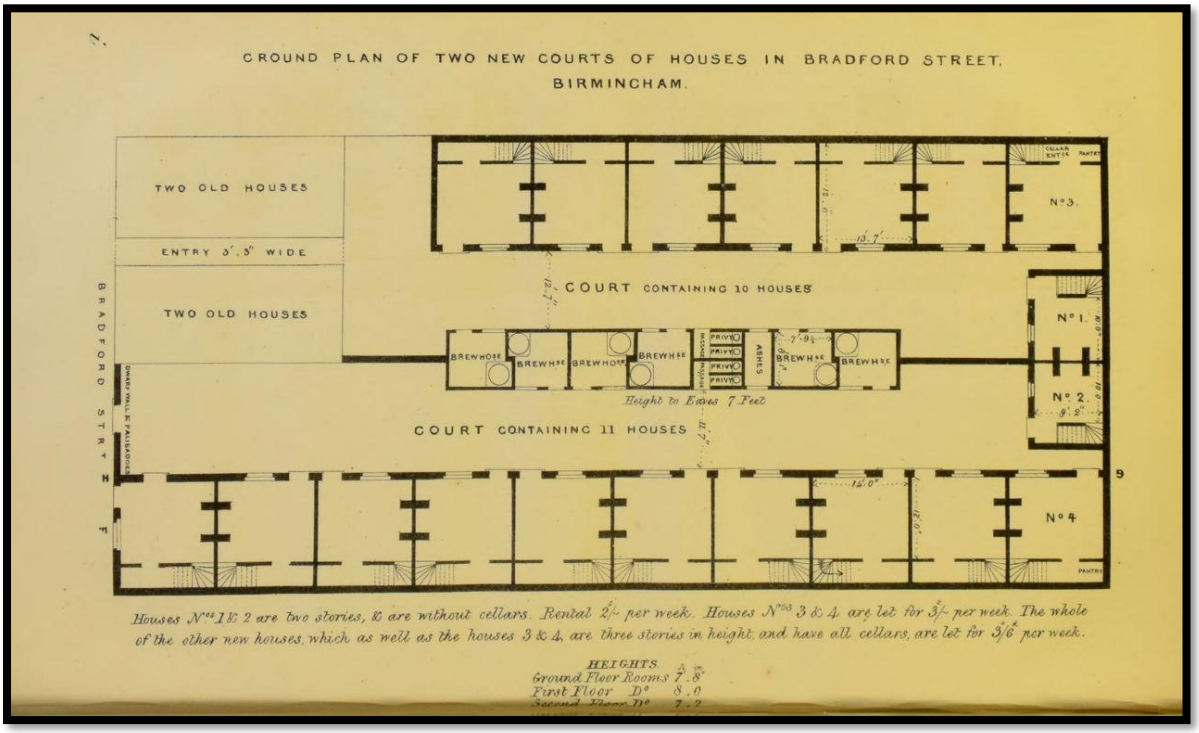


Figure 2.2: Ground Plan of Two New Courts of Houses in Bradford Street Birmingham

E. Chadwick, *Report to Her Majesty's Principal Secretary of State for the Home Department from the Poor Law Commissioners, on an Inquiry into the sanitary condition of the labouring population of Great Britain: with appendices* (London, 1842). Source: Wellcome Collection. Public Domain Mark

The quality of these buildings varied greatly and whilst acknowledging that there was a great deal of 'poor quality building', Hopkins agreed with others that it was too simplistic to state that all housing built to accommodate the working classes was bad.[25] In fact the last surviving example of back-to-back housing in Birmingham (Court 15, Inge Street), now preserved as a heritage attraction under the National

[24] Skipp, *Making of Victorian Birmingham,* pp. 197-8; Rawlinson, *1849 Report on Birmingham*, p. 67; Chinn, *Poverty Amidst Prosperity*, p. 84.
[25] Hopkins, 'Working-Class Housing', pp. 80, 84.

Trust, is an example of a better quality-built back to back.[26] However, sanitary living conditions could still be poor regardless of build quality. Mixing domestic and industrial properties meant prolonged or constant exposure to atmospheric pollution coupled with exposure to human, animal and manufacturing wastes.[27] The sanitary reports particularly criticised the 2,000 or so courts of back-to-back houses that existed in the 1840s, with poor ventilation, overcrowding, tainted water supply and a lack of 'systematic cleansing' considered detrimental to health. Overflowing privies, pigsties and ashpits travelled to the poorly drained narrow alleys or remained in the courts as stagnant pools.[28] Years later, an 1876 image of Birmingham's slum courts in *The Graphic* (Fig. 2.3) suggests that not much had changed for those living back-to-back.[29]

Despite awareness of the poor conditions in the 1840s, this type of housing continued to be built, increasing from approximately 2,000 courts of over 12,200 houses to over 39,000 houses by 1875.[30] The expansion was driven by a growing unskilled labour force who required cheap rents close to work. It was not until 1876 that Birmingham council passed a byelaw that prevented the building of new back-to-back housing, but the existing ones remained part of the housing stock.[31] In contrast,

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[26] *National Trust, Birmingham Back to Backs* (2023) https://www.nationaltrust.org.uk/visit/birmingham-west-midlands/birmingham-back-to-backs [accessed 14 March 2023]. For a detailed exploration of back-to-back housing in Birmingham and the people who lived in Court 15, see C. Upton, *Living Back-to-Back* (Phillimore, 2005).

[27] Luckin, *Death and Survival,* pp. 93-94.

[28] *State of Large Towns*, pp. 198-201.

[29] Although these 'sketches of the condemned localities' were commissioned and promoted the first provincial use of the new Artisans and Labourers' Dwelling Act, the reports and minutes of the council's Improvement Committee (established in 1875) do not suggest they were an exaggeration. *The Graphic*, 16 December 1876; BAC, BCC1/AX/1/1/1, Improvement Committee Minutes 31 July 1875 – 22 May 1878; Upton, *Living Back-to-Back.*

[30] J. T. Bunce*, History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885), p. 98.

[31] 30% of the population still lived in this type of housing in 1901 and they continued to be part of the stock into the mid-twentieth century. See Harrison, p. 108. Also, this film from 1956 by City of Birmingham Public Works

back-to-back housing continued to be built in Leeds up until 1937, through the use of a legal loophole despite prohibitive legislation.[32]



Figure 2.3: Birmingham Improvements Under the Artisans' and Labourers' Dwellings Improvement Act 1875, *The Graphic*, 16 December 1876.
Photo: Birmingham Museums Trust licensed under CCO.

In 1842 a conservative estimate of four people per house was used to calculate that over 49,000 people lived in these courts in the parish of Birmingham alone (the population according to the 1841 census was 182,922).[33] It is likely that there were larger families in some houses, who were only able to afford that level of rent, but from their perspective it was preferable to have sole occupancy of a house. Back-to-

Department, 'City of Birmingham Central Areas Redevelopment', *The Media Archive for Central England*; available at https://www.macearchive.org/films/city-birmingham-central-areas-redevelopment [accessed 14 March 2023].

[32] Harrison, p. 101.

[33] *Local Inquiry Reports for Birmingham*, p. 194; 'Birmingham Population Figures', in C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World,* p. 322.

back living meant shared facilities within the central communal courtyard. The design meant that there was little or difficult access to empty and clean the shared ashpits and privies, which meant infrequent attention. As carts could not access the narrow courtyard entries, there was a reported practice of emptying the contents onto the streets to be carted away in the morning; inevitably, however, residue remained in the street awaiting rain to wash it away or heat to evaporate the filthy ditches and pools.[34]

Keeping pigs in the courts was commonplace and was one of the most reported nuisances along with drains and privies.[35] As a perceived public nuisance, before the Public Health Acts of the 1870s, the Nuisance Removals and Disease Prevention Acts were the principal 'weapon' used for this type of nuisance removal.[36] However, Sigsworth and Worboys agree with others, that in an urban environment with no systematic waste disposal, the keeping of pigs was actually quite 'rational' as a means to dispose of food waste and provide meat.[37] Upton highlights that in some cases this was a transference of a 'rural lifestyle' into an urban environment by workers flowing into the town from the countryside or from Ireland.[38] A less frequently reported nuisance was the keeping of horse manure within the courts. Similarly, this too could be seen as rational behaviour by an enterprising individual or family who supplemented their income with the collection and selling of manure. Being told that

[34] *Local Inquiry Reports for Birmingham,* pp. 193, 195; Upton, *Living Back-to-Back*, pp. 79-97.
[35] BAC, BCC1/AR/1/1/5, Borough Inspection Committee Minutes 1867-1871.
[36] J. L. Macmorran, *Municipal Public Works and Planning in Birmingham: A Record of the Administration and Achievements of the Public Works Committee and Department of the Borough and City of Birmingham 1852-1972* (Birmingham, 1973), p. 33; Sigsworth and Worboys, 'The Public's View of Public Health', p. 244; see Relevant Timeline for Birmingham, pp. xii of this thesis.
[37] Wohl, Smith and Evans cited in Sigsworth and Worboys, 'The Public's View' of Public Health', p. 244.
[38] Upton, *Living Back-to-Back*, p. 84.

they could not do this, and that the nuisance must be removed, must have been seen as an unjust intervention and an infringement of rights.[39]

Jonathan Reinarz points out that 'the homes of the poor' were often 'characterized by their offensive smells'.[40] In common with other industrial urban centres, there were great inequalities in terms of living conditions, and the poorest working classes of Birmingham endured the worst of the dirty, smelly and unsanitary circumstances. As tenants and without organised waste management they had little or no control over sanitary arrangements and the shared facilities. The sanitary situation in the courts was extremely poor but the entire town required a more systematic arrangement for waste management.

Waste: Streets, Sewerage, Nightsoil and Refuse

Under the Birmingham Street Commissioners, there was a system of waste removal in the 1840s, following the common method of transferring urban waste 'to the countryside'.[41] However, this may have applied only to those streets that were easily accessible. Crucially, there was no single administrative body responsible for the entire town, something that Rawlinson criticised in his report.[42] That said, Rawlinson was complimentary about the 'macadamized' streets which were regularly watered and cleaned by the twenty-three water carts and the twelve Whitworth street-cleaning

[39] Sigsworth and Worboys, 'The Public's View of Public Health', p. 244.
[40] J. Reinarz, *Past Scents: Historical Perspectives on Smell*, (Urbana, Chicago, and Springfield, 2014), p. 163.
[41] *Local Inquiry Reports for Birmingham*, p. 199; J. Sheail, 'Town Wastes, Agricultural Sustainability and Victorian Sewage', *Urban History*, 23, 2 (1996), pp. 189-210, p. 189.
[42] Rawlinson. *1849 Report on Birmingham*, pp. 12-14. For more about this question, see D. Taylor, 'Governance and Locality in the Age of Reform: Birmingham 1769-1852', (Unpublished PhD Thesis, University of Birmingham, 2017), pp. 242-250.

machines that belonged to the Commissioners.[43] Donna Taylor argues that the Street Commissioners up to 1852 performed effective work, being organised and 'sophisticated', bringing about changes that encouraged economic and demographic growth, as well as garnering an international reputation for some of its trades. However, Taylor also acknowledges that some problems persisted, including sewage and managing private contractors for gas lighting.[44] After the Improvement Act 1851, the responsibilities for maintaining streets and footpaths, cleaning and lighting and sewer construction passed to the council and were invested with the Public Works Committee (PWC).

Birmingham, like any other industrial town, had markets, shops and all manner of traders, workshops and manufactories. There were the prominent trades of metal work, gun-making, pen-making and japanning, as well as individual traders with 300 butchers and 564 hotels, inns and taverns noted in Rawlinson's report.[45] They all generated human and industrial waste and noxious smells inevitably emanated from their processes.[46] The situation was further exacerbated by the animal excrement and carcasses from the slaughter-houses, and from animal skinners and tanners. Additional contributing factors included the cattle market and, naturally, vast numbers of horses that were essential for carriage and transport of all goods within and beyond the town. Indeed, the universal presence of horses in the urban environment

[43] Rawlinson, *1849 Report on Birmingham*, p. 66; Macadam was broken stones in tar or bitumen used as surface layers for roads and paths.
[44] After 1769, a body of Street Commissioners had powers to levy a rate for streets and lighting and, later, to provide a police force and construct public buildings, W. B. Stephens (ed.), 'The City of Birmingham' in *A History of the County of Warwick: Volume 7, the City of Birmingham* (London, 1964), pp. 1-3. *British History Online*, http://www.british-history.ac.uk/vch/warks/vol7/pp1-3 [accessed 9 February 2019]. For more on Birmingham's Street Commissioners, see Taylor, 'Governance and Locality in the Age of Reform'.
[45] Rawlinson, *1849 Report on Birmingham*, p. 42.
[46] For a discussion on 'Smell and the City', see J. Reinarz, *Past Scent,* pp. 177-208.

should not be understated:[47] during this period, the PWC alone kept forty-nine horses for the work of the department and this number had increased to 93 by 1891.[48] After collection, horse manure was generally heaped somewhere, and provided an excellent breeding ground for flies (the consequences of which are discussed in Chapters Six and Eight).

The key criticism of the 1840s sanitary reports was the lack of a town drainage and sewerage system, in the wake of Chadwick's influential 'self-cleansing sewer' and integrated water and drainage systems.[49] There were sewers: over forty miles of drains and sewers were laid down in the town before 1845. However, the surveyor, John Pigott Smith, understood that there was no organisation to the system and that many unconnected private drains rendered the system ineffective.[50] Much of the sewage that did find its way to the system, passed directly into the River Rea.[51] In the areas without sewerage, ditches and culverts discharged into the porous soil or the surrounding rivers and streams.

Council records suggest that street improvements were a priority.[52] Streets were 'taken to' by the council entering into negotiations with landowners and there was a programme of repair and improvement including footpaths and carriageways.[53] This assisted with drainage and cleansing and improved the state of the vicinity where work was done. For the financial year of 1870, the PWC estimated that it would

[47] B. Holden, *Birmingham's Working Horses* (Birmingham, 1989).
[48] Bunce, *History of the Corporation II,* p. 78; Macmorran, *Municipal Public Works,* p. 148.
[49] Sheail, 'Town Wastes', p. 190.
[50] See Appendix 1: Index of Persons for more about John Pigott Smith.
[51] Rawlinson, *1849 Report on Birmingham*, pp. 28, 46.
[52] See Macmorran, *Municipal Public Works.*
[53] For full details, see Bunce, *History of the Corporation II*, pp. 62-75 and pp. 79-84.

spend a total of £30,214 on repairing the streets and a total of £12,757 for the cleansing and watering of the streets (see Appendix 2).[54]

Conversely, the situation with nightsoil is less clear. The main form of toilet provision in the poorer courts continued to be midden or ashpit privies. This form of 'dry' system used earth or ash to soak liquid and deodorise.[55] Nightsoil collections used to be contracted out but by 1853 they became a public works responsibility, continuing the age-old method of collecting, heaping at canal-side wharves, selling to farmers for manure or removing out of the town.[56] In 1870, £12,000 was recorded for removing nightsoil but unlike street cleansing, there was no breakdown of costs (see Appendix 2). Nightsoil was also estimated to generate an income of £5,000 and a further £600 for the sale of manure, but surviving records offer no detail on frequency of collection or from what properties.[57] A sewage crisis and inquiry in 1871 (discussed in Chapter Four) clarified the situation when the borough's own Inspector of Nuisances acknowledged the infrequency of ashpit emptying and the bad condition of most privies in the town.[58] The courtyards of overflowing middens described in the 1840s had obviously continued unabated. Rapid urbanisation, inadequate provision, and a lack of regular collection and cleansing saw conditions worsen. It can only be assumed that other refuse was deposited in the streets by residents or traders, to be collected whenever the streets were cleaned. A history of the PWC confirms that there is very little in the committee minutes about cleansing for 'about 10 years', but

[54] BAC, BCC1/AR/1/1/5, Public Works Committee Minutes 1866-1870, Estimate for Expenditure & Income for the Year 1870.
[55] Eveleigh, *Privies and Water Closets*, p. 15-19; Sheail, 'Town Wastes', p. 194.
[56] Bunce, *History of the Corporation II*, p. 140. For more detail about the work of the Public Works Committee, see Macmorran, *Municipal Public Works.*
[57] BAC, BCC1/AO/1/1/7, Public Works Committee Minutes 1866-1870.
[58] BAC, BCC1/AV/1/1/1, Sewage Inquiry Committee Minutes, 9 August 1871.

this thesis contests that publication's optimistic conclusion that it must have been carried out to the satisfaction of the public.[59]

Water Supply before 1872

Birmingham's water supply offers a good example of what Luckin refers to as 'large differentials' in the supply of water and of how closely linked were the variables of quality and quantity.[60] Growing demand for water in towns often meant the prioritisation of supply over quality. Industrialisation and urbanisation saw the pollution of supplies and very often, water companies were delivering to their customers via pipes, a sewage-tainted supply.[61] This was the situation in Birmingham.

Although the availability of water is ultimately governed by the water cycle,[62] some places have fortunate geological features. Birmingham had the advantages of natural drainage and was considered to have an ample water supply. Rawlinson reported that, 'the stratification of the district is full of water […] private wells and pumps are constructed very generally'.[63] It is one of the highest cities above sea level in the United Kingdom, being situated on the Birmingham Plateau between two of the great watersheds (basins) of the country, feeding the rivers Trent and Severn. In addition

[59] Macmorran, *Municipal Public Works,* p. 6.
[60] Luckin, *Death and Survival*, p. 106.
[61] Luckin, *Death and Survival*, p. 107.
[62] J. A. Hassan, 'The Water Industry 1900–51: A Failure of Public Policy?', in *The Political Economy of Nationalisation in Britain 1920-1950*, edited by R. Millward and J. Singleton (Cambridge: Cambridge University Press, 1995), pp. 189-211, p. 189.
[63] Rawlinson, *1849 Report on Birmingham*, 1849, p. 48; E. Hopkins, *The Rise of the Manufacturing Town: Birmingham and the Industrial Revolution* (Stroud, 1998), pp. 122-123.

to the water table and groundwater, the main surface sources are the rivers Rea, Tame and Cole with their network of smaller tributaries (Fig. 2.4).[64]

Professor Charles Lapworth, in the latter part of the nineteenth century, identified that many of the older towns of the Midlands, such as Warwick, Coventry, Tamworth and Birmingham were built on the 'Triassic Waterstone Formation' which was rich in springs.[65] It was common for baths to be established at such sources, including the most well-known in Birmingham, namely the private baths at Ladywell.[66] Some springs were considered to have healing properties, with the Birmingham historian, William Hutton, reporting a Chalybeate Spring and its use for diseases of the eye.[67] John A. Hassan discusses how these underground aquifers were an important source in the West Midlands and London but could also be a source of friction. Water companies (private or public) had no powers to stop landowners draining supplies; conversely, landowners had no powers to stop water companies taking their lawful supply and lowering the water table.[68]

[64] British Association, *Birmingham and its Regional Setting: A Scientific Survey* (Birmingham, 1950), pp. 3-7.
[65] B. Smith, 'Water Supply', *Geography*, 20, 2 (1935), pp. 75-85, p. 75. A spring is a natural exit point at which groundwater emerges out of the aquifer and flows onto the top of the Earth's crust to become surface water. Charles Lapworth was the first professor of geology in 1881 at Mason College (a predecessor college of University of Birmingham) until 1913 and was a leading authority on the geology of the Midlands. See B. Ambrose-Hamilton, 'Lapworth, Charles (1842-1920)', *ODNB,* https://doi.org/10.1093/ref:odnb/37655 [accessed 8 December 2023].
[66] BAC, L05.1/264232, H. S Pearson, *Birmingham Springs and Wells* (Birmingham, 1902).
[67] Rawlinson, *1849 Report on Birmingham*, p. 57.
[68] Hassan, 'The Water Industry', p. 193.

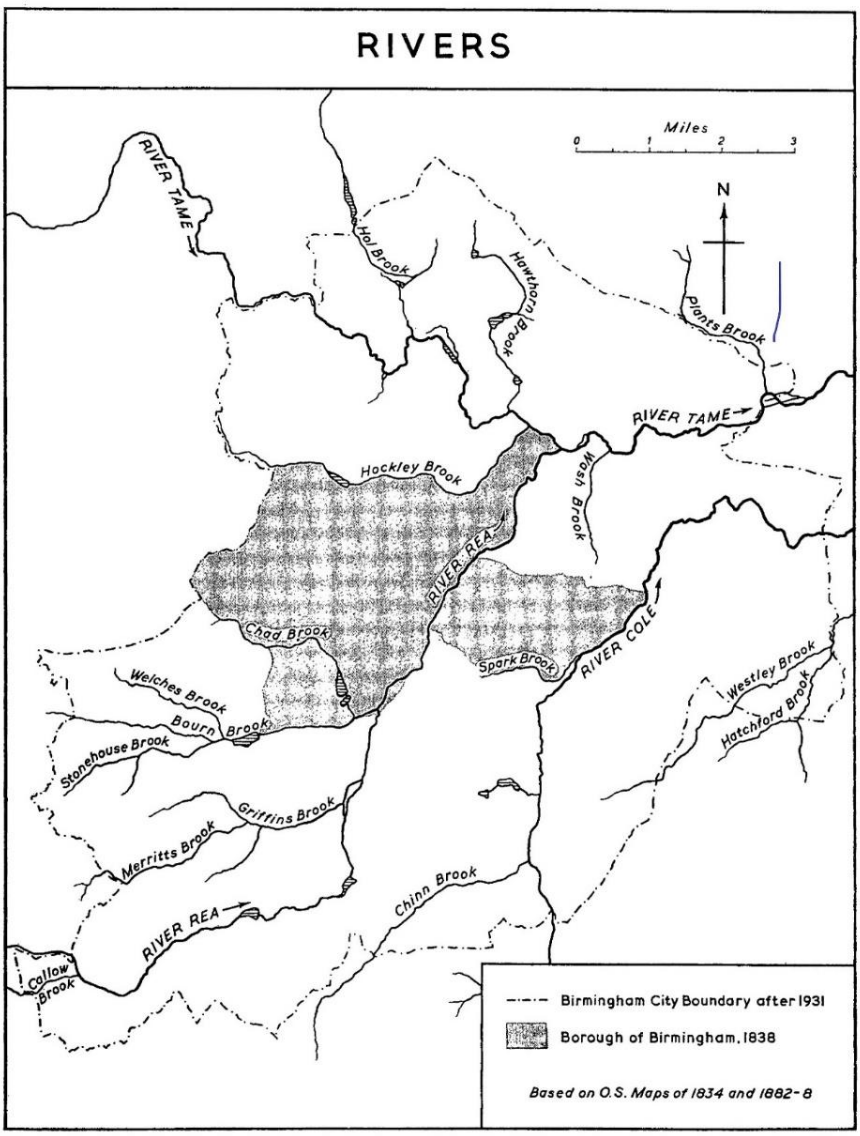


Figure 2.4: Birmingham Rivers and Tributaries

Reproduced with permission from *A History of the County of Warwick: Volume 7, the City of Birmingham* (London, 1964). Victoria County History © University of London.

The shallow water table was easily reached by digging down and constructing a well, so that the water could be brought up by a hand pump (see Fig. 2.1 for an example). Springs and shallow wells were abundant around Birmingham and were the major source of water supply by the start of the nineteenth century, at which time they were

able to satisfy demand.[69] The deeper groundwater sources could only be reached by bore-holes through the rock. Contemporary sources describing Birmingham often mention artesian wells, but in the nineteenth century this term often referred to deep bored wells with water pumped to the surface.[70]

Domestic Supply: Rivers, Wells and Butts

There was only ever one private waterworks in the town, the issue being contentious in Birmingham for reasons that are discussed in more detail later (see Chapters Three and Five). Birmingham Waterworks Company started supplying the town and surrounding districts in 1831, when water from the Tame was stored in a 30-million-gallon reservoir at Aston.[71] The company charged on the annual value of the premises supplied (for a house valued at £15 per annum, the charge was £1 5s 0d). By the time of the Rawlinson report in 1849, the waterworks supplied one third of the town – those who could afford and were prepared to pay water rates. However, the supply was intermittent on three days in each week. After 1853 it was said to offer a 'constant' supply,[72] although this was debatable, as in many cases very few

[69] City of Birmingham Water Department, *History of the City of Birmingham Water Department* (Birmingham, 1974), p. 3.
[70] A true artesian well is when the underground water, tapped by boring, reaches the surface by hydrostatic pressure alone without pumping due to particular geological conditions. However, the term artesian was also used for pumped deep wells, for example in 'The Birmingham Sanitary Conference', *The Lancet*, 23 Jan 1875 and 'Birmingham', *The Lancet*, 23 Aug 1879. For more detailed information on underground water supply for the midland region, see W. S. Boulton, 'Underground Water Supplies in the Midlands for Brewery Purposes', *Journal of the Institute of Brewing*, 38, 4 (1932), pp. 353-360, p. 355.
[71] The Act for 'supplying water to the town and neighbourhood of Birmingham' was passed in 1826. Promoters of the scheme, numbering nearly 80 leading inhabitants, included the well-known names of Attwood, Spooner. Anderton, Lloyd and Scholefield. Information from Cadbury Research Library: Special Collections, University of Birmingham (CRLSC), r L343.B6, C. E. Matthews, *The Water Supply of Birmingham: A Paper Read before the British Association for the Advancement of Science* (Birmingham, 1886), p. 4.
[72] *History of the City of Birmingham Water Department*, pp. 3-5.

waterworks could deliver consistently if adverse weather conditions affected supply.[73] The Tame remained the principal source of supply until the late 1860s, although after 1855 additional surface sources were being used.[74]

For the other two-thirds of the population, most obtained their supply from the shallow wells with pumps in nearly every court. However, there were houses and courtyards without any water supply, such as Court 15 Inge Street (National Trust Back to Backs), which did not have a piped supply to the courtyard until the 1870s. The Levy family, residents during the 1840s, had to bring all their water from Ladywell.[75] Others may have resorted to collecting rainwater in butts, taking their supply directly from rivers and streams or even 'stealing' water from someone else's piped supply – a crime for which the waterworks company vigorously pursued prosecution. Regardless of how water was obtained, it had to be collected and stored in the home and if uncovered was exposed to air, dirt and insects.[76] Upton reminds us that water was not the drink of choice (that was generally tea or beer due to the purifying processes of boiling and brewing) but water was still needed for the washing of people, food, clothes and the home.[77] The meagre supply obtained by a poorer family, depending on who could fetch and carry and the means of storage, had to suffice large families for all uses in the domestic 'micro-environment'. This

[73] S. Sheard, 'Water and Health: The Formation and Exploitation of the Relationship in Liverpool, 1847-1900', *Transactions of The Historic Society of Lancashire and Cheshire,* 143 (1993), pp. 141-163, p. 145.
[74] *History of the City of Birmingham Water Department*, pp. 3-5.
[75] Information courtesy of National Trust, Birmingham Back to Backs in A. Cooper and E. Hartshorn (updated by M. Miah) 'Victorian Life Back to Backs: A Resource Pack' , unpublished resource pack for volunteers (2006), p. 21.
[76] Bunce, *History of the Corporation II,* p. 409; C. Chinn, *Poverty Amidst Prosperity*, p. 90.
[77] Upton, *Living Back-to-Back*, pp. 82-83.

meant choices on best use, while using smaller amounts of water most likely increased the spread of infection.[78]

Upton refers to the 'town pump, free to all users', situated in front of St. Martin's church in the Bull Ring, but not everyone could walk to and carry from there.[79] Other options were to buy from public pumps and watercarts, because they were closer and labour-saving, and possibly offered better quality if water came from the local springs or deeper sources. However, Rawlinson noted that these were expensive options and levels of income would have determined access to this amenity and excluded many (3.5 gallons or a 'can full' cost a half-penny from a watercart in 1849).[80] Later sources suggest that the town's water carriers were the primary consumers at Ladywell and Digbeth, with 'Digbeth Water' still dispensed from carts in the 1880s as it was reputedly 'better for domestic use and tea'.[81] Landowners blessed with such supplies had a considerable source of revenue and would therefore vigorously protect their rights.[82] However, after years of private ownership, the situation at Ladywell altered in 1868 when landowner Sir Ernest Sherlock Gooch offered the well to the inhabitants of the town as long as the council maintained it. The council accepted the offer and worked towards a design for the pump and installed a tablet acknowledging the gift to the town.[83] Council records from the 1860s

[78] Luckin, *Death and Survival*, pp. 30, 106.
[79] Upton, *Back-to-Back Living*, p. 82.
[80] Rawlinson*, 1849 Report on Birmingham*, p. 48; Upton, *A History of Birmingham*, p. 137; Hopkins, *Rise of the Manufacturing Town*, p. 123; Upton, *Back-to-Back Living*, p. 81; Sigsworth and Worboys, 'The Public's View of Public Health', p. 246.
[81] BAC, 'Mineral Springs in Digbeth', *Birmingham Faces and Places*, 1, 1 (1888), pp. 171-172; Pearson, *Birmingham Springs and Wells*, p. 5. For more on conduit heads, distribution by water carrier and cart and forcing water up by pumps, see H. Barty-King, *Water, The Book: An Illustrated History of Water Supply and Wastewater in the United Kingdom* (London, 1992), pp. 33-41.
[82] 'Mineral Springs in Digbeth', p. 172; Hassan, 'The Water Industry', p. 193.
[83] *Birmingham Daily Post (BDP)*, 5 August and 28 October 1868.

suggest that other philanthropic individuals or church congregations had also provided a small number of drinking fountains around the town, maintained by the council and costing £20 per annum.[84]

In 1869, using a sample of '4000 small dwellings', Alderman Thomas Avery calculated that half the properties in the town were supplied by the waterworks and half by wells.[85] In 1875 a more extensive council survey of over 70,000 houses of the poorer classes revealed that sixty-six percent of those properties used 'tap water' for their supply, with the rest reliant on wells and a hundred properties classified as having no water supply (Table 2.1). However, that survey excluded better properties and it only defined which type of supply each property was served by: it gave no information on how many houses, or the number of inhabitants, shared each communal tap or well.[86]

[84] BAC, Birmingham City Council Collection, BCC1/AR/1/1/5, Borough Inspection Committee Minutes 1867-1871, 23 December 1868; Bunce, *History of the Corporation II*, p. 76.
[85] For more about Thomas Avery, see Appendix 1: Index of Persons; BAC, L43.3/31078, T. Avery, *The Corporation of Birmingham and the Water Supply of the Town: A Statement Addressed to Members of the Town Council* (Birmingham, 1869), pp. 13-14.
[86] BAC, BCC1/AR/1/1/7, Sanitary Committee Minutes 1874-1876, 3 February 1875, 'Tabulated Statement of the Sanitary Census of the Borough of Birmingham 30 January 1875'.

Ward	No. of Houses	Total Inhabitants	Tap	Pump	None
All Saints	5037	21499	2648	2380	9
Rotton Park	4345	20254	2571	1768	6
Edgbaston	2057	8683	764	1293	0
St. Thomas	4926	20879	3779	1133	14
Ladywood	4738	20814	3949	789	0
St. Paul's	3914	16732	3502	412	0
St. George's	4978	22040	63722	1244	12
St. Stephen's	4362	19873	2938	1422	2
St. Mary's	4795	20658	4399	395	1
Market Hall	2806	10950	2066	727	13
St. Martin's	4664	19483	2510	2152	2
Deritend	4851	21754	2402	2435	14
Bordesley	4614	20262	1318	3292	4
St. Bartholomew's	5307	23323	3664	1623	20
Duddeston	4203	18111	3199	1002	2
Nechells	4964	22259	3168	1794	2
Totals	**70561**	**307574**	**46599**	**23861**	**101**

Table 2.1: Tabulated Statement of the Sanitary Census of the Borough of Birmingham 30 January 1875.[87]

Industrial Supply

Demands on Birmingham's water resources were high and continued to grow. Dotted around the town were private and public baths and washhouses, all fed by natural springs or deep wells.[88] Industry and commercial businesses needed water too. Local breweries also had several private bore-holes to meet their high demand and to give a distinctive character to their product.[89] In addition to manufacturing and

[87] Information taken from BAC, BCC1/AR/1/1/7, Sanitary Committee Minutes 1874-1876, 3 February 1875. Note: The minutes reveal that the census does not include all the houses in the borough, the object being to obtain a return only for those houses with which they might fairly be expected to have to deal in carrying out their new scheme (sanitary inspection). The places which have not been inspected are those which it is anticipated will require only slight sanitary supervision.

[88] In 1830 there were reported to be ten privately-owned baths and the first public baths were opened in Kent Street in 1851, see J. Moth, *The City of Birmingham Baths Department 1851-1951* (Birmingham, 1951), pp. 1, 6.

[89] Boulton, 'Underground Water Supplies for Brewery', pp. 353-360.

amenities, water was a source of power. Even though there was a decline in water-powered mills, water was needed for steam engines.[90] Similarly, in spite of the arrival of the railway, canal navigations remained a vital transport network and they needed constant replenishment to operate the lock systems and keep industry moving.[91] The reservoir in the Rotton Park area of Birmingham (now known as Edgbaston Reservoir) was constructed in the early nineteenth century for this very purpose and not for water supply.[92] Rapid urbanisation and industrialisation placed immense demands on the same resources, which could only be replenished by rainfall and were therefore subject to variation or disruption at times of dry weather or severe drought.[93] There were consequences at times of reduced supply.

Climate and Weather

Between 1854 and 1860 there was an extensive drought which included a particularly long, hot summer in 1858.[94] Severe droughts could affect the groundwater supply and have a devastating impact, socially and economically, on all those relying on the same water resources. However, there were political consequences as well and a famous example is 'The Great Stink' on the River Thames, due to the long, hot summer in 1858, on the very doorstep of the Houses of Parliament (discussed later on).[95]

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[90] Stephens, 'Economic and Social History: Mills' in *A History of the County of Warwick: Volume 7,* pp. 253-269.
[91] P. Maw, T. Wyke and A. Kidd, 'Canals, Rivers, and the Industrial City: Manchester's Industrial Waterfront, 1790–1850', *Economic History Review*, 65, 4 (2012), pp. 1495-1523.
[92] S. R. Broadbridge, *The Birmingham Canal Navigations, Vol. I, 1768-1846* (Newton Abbot, 1974), pp. 102-103.
[93] Hassan, 'The Water Industry', p. 189.
[94] See G. A. Cole and T. J. Marsh, *Major Droughts in England and Wales from 1800 and Evidence of Impact* (Bristol, 2006), p. 32, available at: https://www.gov.uk/government/publications/the-impact-of-climate-change-on-severe-droughts [Accessed 19 Aug 2018]; also T. Marsh, G. Cole and R Wilby, 'Major Droughts in England and Wales 1800-2006', *Weather*, 62, 4 (2007), pp. 87-93.
[95] S. Halliday, *The Great Stink of London: Sir Joseph Bazalgette and the Cleansing of the Victorian Metropolis* (Stroud, 1999).

From a local perspective, there was another difficult summer in 1868 and newspaper reports reveal that Birmingham was experiencing an 'intense drought' and higher-than-normal mortality. So much so, that in response to hardship, the council passed a resolution that any excess water pumped at municipal baths was to be given freely to the public.[96] This suggests that by August 1868, the water table had become seriously depleted and that citizens who relied on free supplies from the shallow wells were in desperate need. Local newspapers reported on council debates about the causes of high mortality and in particular, high infant deaths due to diarrhoea. Councillors blamed factors beyond their control: the heat, bad water from the waterworks and the polluted wells which they were powerless to close.[97] However, soon after the council added taps to distribute the surplus baths water, the Birmingham Waterworks Company threatened legal action for infringement of their parliamentary rights and sought an injunction. After seeking legal advice, the council had no choice but to remove the taps and stop the free supply.[98] This is an example of the friction referred to by Hassan. At a time of scarce resources, the company was concerned that the council would be draining supplies and hindering its commitment to meet customers' demands.[99] This friction between local government and the private waterworks company obviously had a detrimental effect on the poorer citizens of the town and the council was powerless to do anything about it. It is possible that the situation may well have been the motivation for Gooch's gift to the town of Ladywell in that year (although the Ladywell private baths had been in decline and

[96] *BDP*, 5 August 1868.
[97] *BDP*, 6 May, 5 and 19 August 1868.
[98] *BDP*, 10 November 1868; Macmorran, *Municipal Public Works*, p. 6.
[99] Hassan, 'The Water Industry', p. 193.

may have held no further commercial interest for Gooch).[100] However, the friction was more complex, with the company resentful at the bad publicity generated against it by the council, who continually blamed high death rates on bad water from the waterworks and the River Tame. From the company's perspective, the council was one of the major polluters, discharging the town's sewage directly into the river: a matter for which the council was mired in litigation with local landowner, Charles Adderley (see Chapter Four).[101]

Rawlinson described Birmingham's supply in 1849 as 'imperfectly supplied water from several independent sources'.[102] The evidence suggests that there was little change between the 1850s and early 1870s, with a varied and changing mix of private and public water supplies. This generated inequalities between the different social classes in terms of access and the quantity available. Those inequalities were further exacerbated by the quality of the water supply.

Pollution: Quality of Supply

Rawlinson reasonably supposed that when first constructed, the abundance of shallow wells had provided a clean source of water, but by the time of his report, the town's population had increased from 1801 by more than 110,000. In the increasingly overcrowded and poorly-built courts, those wells became more and more polluted.[103]

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[100] J. Townley, 'Ladywell', *The Iron Room: Archives & Collections @ Library of Birmingham* [Blog], posted 7 January 2019, https://theironroom.wordpress.com/2019/01/07/lady-well/ [accessed 9 December 2023].
[101] L. Rosenthal, *The River Pollution Dilemma in Victorian England: Nuisance Law Versus Economic Efficiency* (Oxon, 2014).
[102] Rawlinson, *1849 Report on Birmingham,* p. 48.
[103] Rawlinson, *1849 Report on Birmingham*, p. 48; 'Birmingham Population Figures' in C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World,* p. 322.

Figure 2.5 illustrates just how easily, in a domestic environment without adequate drains or sewerage, a well might become polluted.

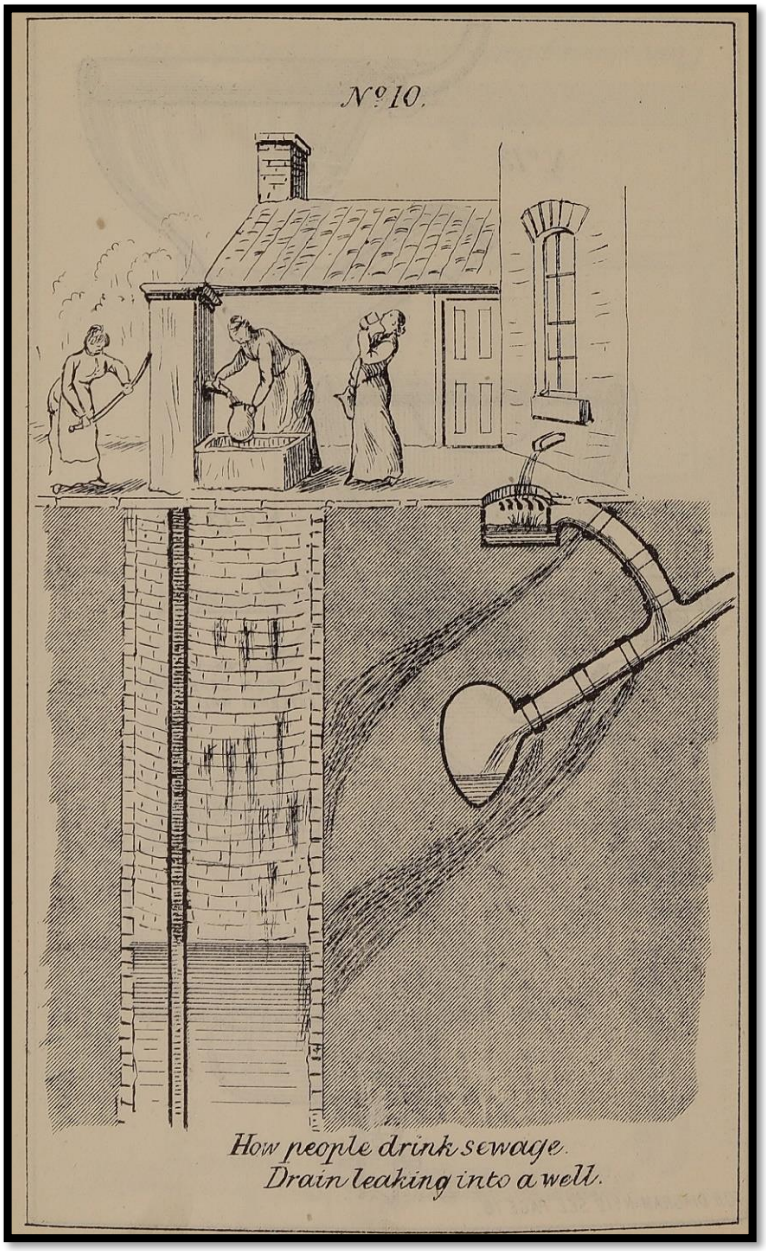


Figure 2.5: Illustration: How People Drink Sewage, Drain Leaking into a Well

This drawing is from A. Hill, *The Dangers of Defective Drainage* (Birmingham, 1883), Supplement, p.11. Cadbury Research Library: Special Collections, University of Birmingham, p. TD913.[104]

[104] This drawing, originally produced for a work by Thomas Pridgin Teale, *Dangers to Health: A Pictorial Guide to Domestic Sanitary Defects* (1878), was reproduced with permission in Dr Alfred Hill's pamphlet of 1883.

One of Rawlinson's key recommendations for Birmingham was that a supply of water should be 'laid on to every house and yard, to entire superseding of all local wells and pumps, the water of which is impure'.[105] In the wake of a further cholera epidemic in 1848-9, contaminated water supplies had become an important national issue. Although miasmatic theory still prevailed, in 1849 John Snow had published his theory *On the Mode of Communication of Cholera,* suggesting that the contamination of drinking water was responsible for spreading the disease.[106] However, it seems apparent that it was precisely Birmingham's mix of different water sources, and the absence of an extensive organised supply from one single source, that likely prevented a high mortality from cholera in the 1830s and 1840s. According to Romola Davenport *et al.*, although London had the most extensive organised system of water supply and sewerage in England by 1866, the city's high mortality from cholera was due to the organised delivery of a contaminated water source 'to thousands of households'.[107]

This demonstrates that despite new theories about disease and how it spread, some aspects were still not fully understood. Medical practitioners and sanitary reformers were aware of the new theories but were Birmingham inhabitants aware of the deteriorating quality of the well water? Sigsworth and Worboys argue that the public were especially aware of polluted water supplies.[108] The condition of the River Tame and water analyses of polluted wells were often reported in Birmingham's local press

[105] Rawlinson*, 1849 Report on Birmingham*, p. 80.
[106] R. Porter, *The Greatest Benefit to Mankind: A Medical History of Humanity from Antiquity to the Present* (London, 1997), pp. 412-413. A second edition of John Snow's theory was printed in 1854 with his findings based on the famous Broad Street pump cases.
[107] R. J. Davenport, M. Satchell and L. M. W. Taylor Shaw. 'Cholera as a "Sanitary Test" of British Cities 1831-1866', *The History of the Family,* 24, 2 (2019), pp. 404-438, p. 426.
[108] Sigsworth and Worboys, 'The Public's View of Public Health', p. 241.

but it is difficult to know to what extent this information was disseminated amongst the poorer and least-educated classes.[109] If the public were well aware, this suggests that fear of pollution and disease was one reason why the waterworks supply expanded to serve over sixty-six percent of the houses surveyed in the 1875 sanitary census.[110] However, this in turn implies that, in a choice between polluted wells or the waterworks supply (sourced from the River Tame, Hawthorn Brook and Perry Brook), the waterworks was considered to be less polluted and the safer of the two options. The next section explores whether this was the case or whether other factors, such as convenience and the promise of an organised 'constant' supply, took precedence.[111]

River Pollution

From the sixteenth century, industry and trades had grown around the river and stream systems, which were used as power sources for the many mills that once occupied the area. Industries lining the rivers inevitably meant that waste and by-products of numerous trades found their way into the water.[112] As the River Tame ran through much of the neighbouring Black Country, it was also polluted by local heavy industry there: each town along the course of the river added its own particular industrial pollutants, turning the water different colours.[113] An industrial accident at

[109] *Aris's Birmingham Gazette*, 11 December 1854; *Birmingham Journal*, 1 August 1868, 6 February 1869; *BDP*, 26 May and 8 December 1869, 22 March 1871, 24 November 1875, 28 June 1884.
[110] See Table 2.1: 1875 Sanitary Survey Birmingham.
[111] City of Birmingham Water Department, *History of the City of Birmingham Water Department* (Birmingham, 1974), p. 3.
[112] Stephens, *History of the County of Warwick: Vol 7, the City of Birmingham*, pp. 253-269.
[113] Skipp, *Making of Victorian Birmingham*, pp. 90-94; J. Sullivan, 'Shabby Towns of Smother Amid Smother: Polluting the Black Country', *History West Midlands* (2017-2023) https://historywm.com/articles/shabby-towns-

Willenhall illustrated this and made the waterworks company reconsider its reliance on a single source of supply. In 1854, a gas tank burst, and the liquid found its way into the river, poisoning the fish and making the water unfit for domestic purposes. The company managed to prevent the pollution from entering its reservoir and mains in time but was unable to replenish the supply immediately, so causing inconvenience for its customers.[114] This accident prompted two separate courses of action: the seeking of other sources by the company; and an attempt to municipalise the waterworks by the council, with the intention of abandoning the Tame as a source of supply due to its polluted state (thus demonstrating that people were well aware of the pollution).[115] The municipalisation attempt failed and was rejected at the town meeting stage, but the council did take some action, objecting to one of the company's bills through parliament, and secured a gradual reduction in the domestic use of the Tame, although this was not totally prohibited until 1871.[116] However, other surface sources were also polluted: the first volume of the *History of the Corporation of Birmingham* (1878) describes the River Rea as 'a sewage lake' and the Hockley Brook was just as bad.[117] The council minute books for the 1870s are filled with complaints about the state of all local rivers and tributaries, a situation that was compounded by waste from neighbouring authorities over which Birmingham council had no control.[118]

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of-smother-amid-smother [accessed 9 December 2023]. For more information on the Tame and industry, see 'History', *Tame Valley Wetlands* (n.d.) http://www.tamevalleywetlands.co.uk/discover/history/ [accessed 25 March 2023].

[114] *History of Birmingham Water Department*, p. 5.

[115] Other sources included surface waters but also the boring of deep wells from 1866, *History of Birmingham Water Department*, p. 5; *Aris's Birmingham Gazette*, 20 December 1854.

[116] *History of Birmingham Water Department*, p. 6

[117] Bunce, *History of the Corporation of Birmingham: with a Sketch of the Earlier Government of the Town, Vol. I* (Birmingham, 1878), p. 324.

[118] BAC, BCC1/AR/1/1/7, Sanitary Committee Minutes, 21 July 1875,

In addition to industrial waste, the other major pollutant was sewage and effluent from towns. This found its way into the rivers and streams, either by natural processes such as rain or flood or through deliberate discharging.[119] In common with other towns, Birmingham expanded its sewer system with the design of 'two great mains' to an outlet at Saltley on the River Tame.[120] By 1854, everything that entered those sewers from WCs, middens and drains was discharged completely untreated: this was the great consequential flaw in Chadwick's vision.[121] The condition of the Tame quickly deteriorated, and in a case considered to be the first of its kind, the landowner Charles Adderley (later Lord Norton) used nuisance law to begin legal action in 1858 against the council as the River Tame flowed past his home at Hams Hall.[122] Consequently, there were legal injunctions against the council extending the sewer network between 1859 and 1861 which was the very course of action that sanitary reports had deemed to be necessary.[123]

After 1858, there were some early attempts to treat the sewage at Saltley, before it entered the river, with a couple of settling tanks to filter solids and the spreading of sludge on the land. It became quickly apparent that these methods were completely inadequate. Heavy rains and flooding often washed the liquid effluent which had been spread on the land directly into the river.[124] Such onslaught from the urban environment meant that the river's natural capabilities to dilute and degrade pollutants were overwhelmed at a time when there were no effective methods of

[119] Rosenthal, *River Pollution Dilemma*, pp. 17-18.
[120] Skipp, *Making of Victorian Birmingham*, pp. 93-94.
[121] For discussion on Chadwick's self-cleansing sewer, see Sheail, 'Town Wastes', pp. 190-194.
[122] 'Hams Hall', *Tame Valley Wetlands* (n.d.) http://www.tamevalleywetlands.co.uk/hams-hall2/ [accessed 10 December 2023].
[123] Skipp, *Making of Victorian Birmingham*, p. 87
[124] Rosenthal, *River Pollution Dilemma, pp. 66-67.*

water treatment. By 1871, the legal case brought by Adderley had not been resolved; instead, there was further action, creating a 'sewage crisis' in the town (Chapter Four). The subsequent enquiry revealed that over 7,000 WCs and 14,000 ashpits or middens were draining directly into the sewers and conveyed to the River Tame at the Saltley outlet.[125]

For all these reasons, prior to 1866 and the first use of deep wells, the surface sources used by the waterworks company were far from wholesome and pure. The suspect quality of the water was public knowledge, which suggests more specific use of the waterworks supply (not for drinking) and that convenience and having an organised constant supply were the major motivating factors in joining the network. That said, the deep wells did not become the sole source of supply: a combination of well and surface sources filled the company's reservoirs to meet increasing demand.[126] Interestingly, the company did not appear to have tried to protect its sources, most likely due to the expense of legal action with no guarantee of success, but also because of the sheer number of potential culprit polluters. There was also no specific legislation in place at that time that would have assisted their case.

National Approaches to River Pollution

Birmingham's sewage crisis was but one example of the nationwide problem of river pollution and the 'sewage question'.[127] The sheer scale of contamination in response to the rapid growth of population and industry meant that the situation reached crisis

[125] Bunce, *History of the Corporation II*, p. 131.
[126] Avery, *Water Supply of the Town*, p. 24.
[127] For more on 'the sewage question', see Crook, *Governing Systems*, pp. 169-176.

point. Government attention was finally drawn to the issue when the message was delivered directly to the senses to MPs by the Great Stink of 1858. It is perhaps no coincidence that Adderley's nuisance case began in the same year.[128] This in turn made the issue of water supply ever more important. The problem was considered by royal commissions in 1866 and 1867 which explored options for the supply of large towns by collecting and storing water in the high grounds of England and Wales.[129] The commissions did not merely concentrate on locating other sources of supply but also examined the issue of control and ownership of water supplies. John Simon, the Chief Medical Officer to the Privy Council, was against private ownership and ardently campaigned for municipal water supplies on the grounds of public health. The argument was that in private hands, the main motivation was profit for shareholders rather than ensuring a supply of good quality water as a basic necessity for life. This promoted the ideal that water supplies should be in public hands for the benefit and health of all citizens.[130] Municipal ownership of waterworks was not a new ground-breaking idea – by 1870 sixty-nine local authorities already owned their own waterworks.[131] Despite several different commissions on sewage, river pollution and water supply, legislation specifically for river pollution was not introduced until 1876.[132]

Sanitary reform and public health campaigns gathered momentum during the second half of the nineteenth century. One reformist group, the Social Science Association,

[128] For more on river pollution in London, see Halliday, *The Great Stink of London*.
[129] P. P. Royal Commission on Water Supply. *Report of the Commissioners,* Command Papers, xxxiii.1, 133, 625 (1868-69); *Royal Commission of Water Supply, Report of the Commissioners 1869* (London, 1869).
[130] Hunt, *Building Jerusalem*, pp. 340-341.
[131] Briggs, *Victorian Cities*, p. 224.
[132] Crook, *Governing Systems*, p. 172.

founded in 1857, promoted debate and information on social policy covering public health, penal reform and female education.[133] Pressure from the Social Science Association and British Medical Association were instrumental in the establishment of the Royal Sanitary Commission (RSC). Graham Mooney points out that surprisingly little attention has been paid to the formation of the RSC in 1869 and the subsequent landmark public health legislation of the 1870s.[134] Similarly, little attention has been paid to the impact of the Social Science Association's annual gatherings in large towns and cities. R. K. Huch suggests that the whole 'point' of the annual congresses was to generate interest in reform in that locality and their methods usually paid 'special attention' to the problems of the host town.[135] Birmingham in 1868 is a good case in point.

Social Science Congress, Birmingham 1868

Birmingham had hosted the Association's inaugural congress in 1857, followed by further events in October 1868 and in 1884. Huch describes how the congresses drew large audiences – including the general public – during the 1860s. There were also 'star' appearances by the great names from the reform movement, such as William Farr, Florence Nightingale and John Simon, to generate interest and publicity.[136] In addition to papers by well-known reformers, participation was extended

[133] The National Association for the Promotion of Social Sciences, more commonly known as the Social Science Association. R. K. Huch, 'The National Association for the Promotion of Social Science: Its Contribution to Victorian Health Reform, 1857-1886', *Albion*, 17, 3 (1985), pp. 279-299, p. 279.
[134] G. Mooney, *Intrusive Interventions: Public Health, Domestic Space and Infectious Disease Surveillance in England, 1840-1914* (Rochester, NY, 2015), p. 23.
[135] Huch, pp. 282-283.
[136] Huch, p. 283. For William Farr, statistician and epidemiologist, see the entry by J. M. Eyler 'Farr, William (1807-1883)', *ODNB* http://doi.org/10.1093/ref:odnb/9185 [accessed 10 July 2020]. For Florence Nightingale, a

to local contributors – in 1868 these included Birmingham's Borough Analyst, Dr Alfred Hill.[137] The combination of the Association's methods and Hill's paper had a significant impact in Birmingham. During the congress, the host town was not presented in a good light, forcing discussion of 'the frightful picture of the sanitary condition of Birmingham' at council meetings.[138] Members of the PWC reacted angrily at what had been implied and felt compelled to defend the department's sanitary record by stating that 36,209 'bog holes' had been emptied in 1867.[139] The Association's 'special attention' had involved members of the conference actively visiting the worst parts of the town and talking openly about the appalling conditions they had witnessed. The editor of *The Builder* reported to the Health Section of the congress that, in the districts he had visited, he had seen dilapidated buildings, inadequate privy provision and 'oozing' middens.[140]

However, it was difficult to refute the Association's appraisal of conditions in the town when Hill presented his paper entitled *'What is the relation of water supply in large towns to the health of the inhabitants?'* Using his own chemical analyses, Hill presented his evidence for sewage pollution of rivers and the prevalence of polluted wells in Birmingham, which were the major source of supply for those living in the back to backs.[141] River pollution was also the topic of the paper given by the noted

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reformer of army medical services and of nursing organisation, see the entry by M. E. Baly and H. C. G. Matthew, revised, 'Nightingale, Florence (1820-1910)', *ODNB,* https://doi.org/10.1093/ref:odnb/35241 [accessed 26 November 2023]. For John Simon, surgeon and public health officer, see the entry by C. Hamlin, 'Simon, Sir John (1816-1904), *ODNB* http://doi.org/10.1093/ref:odnb/36097 [accessed 17 June 2020].

[137] See Appendix 1: Index of Persons under section for Medical Officer of Health (MOH).

[138] *BDP*, 21 October 1868.

[139] *BDP*, 21 October 1868.

[140] Quoted in E. P. Hennock, *Fit and Proper Persons, Ideal and Reality in Nineteenth-Century Urban Government* (London, 1973), p. 113.

[141] BAC, Lp45.32/233600, A. Hill, *What is the relation of water supply in large towns to the health of the inhabitants?* (Birmingham, 1868).

civil engineer, Robert Rawlinson (author of the1849 report on Birmingham).[142] This was a major embarrassment for the council and particularly for the mayor that year, who happened to be Avery. As E. P. Hennock highlights, Avery felt forced to defend the city and council citing, as many often did, Birmingham's more favourable overall death rate in comparison with that of other towns (see Fig. 2.6).[143] Hennock, with hindsight, suggests that 'the mischief that these statistics did' was exposed by the Congress, due to the fact that overall death rates 'lumped' wealthier and healthier parts of the city together with overcrowded wards, and thus did not offer a realistic picture. While there is some truth in this suggestion, it was in fact the council's own internal Sewage Inquiry of 1871 that most profoundly demonstrated the disparity between death rates in the different wards of the city.[144]

Despite Avery's defensive declarations, the publicity around the Congress in tandem with the severe drought, the higher-than-usual death rates and the dispute with the waterworks company (a real example of John Simon's argument) all combined that year to have a profound effect on Avery. He was subsequently compelled to devote all his energies to restoring civic pride by addressing the issue of polluted wells raised at the Congress highlighting the fact that the council had no control over the city's water supply. Avery saw a way to tackle both issues and in 1869 and he directed all his attention to the municipalisation of the town's waterworks. In his promotion of the project, he cited Hill's earlier paper and the Royal Commission

[142] Huch, p. 293. Robert Rawlinson was an eminent civil engineer who at one time worked under Robert Stephenson on the London and Birmingham Railway. He was assistant surveyor to the Corporation of Liverpool and in 1848 was appointed a government public health inspector under the Public Health Act. Full biographical entry by T. H. Beare (revised by R. Harrington), 'Rawlinson, Sir Robert (1810-1898)', *ODNB* http://doi.org/10.1093/ref:odnb/23193 [accessed 17 June 2020].
[143] *BDP*, 2 and 5 October 1868 as quoted in Hennock, *Fit and Proper Persons*, p. 114.
[144] Hennock, *Fit and Proper Persons*, pp. 113-114.

findings endorsing John Simon's opinion that water supplies should be in public rather than private hands.[145]

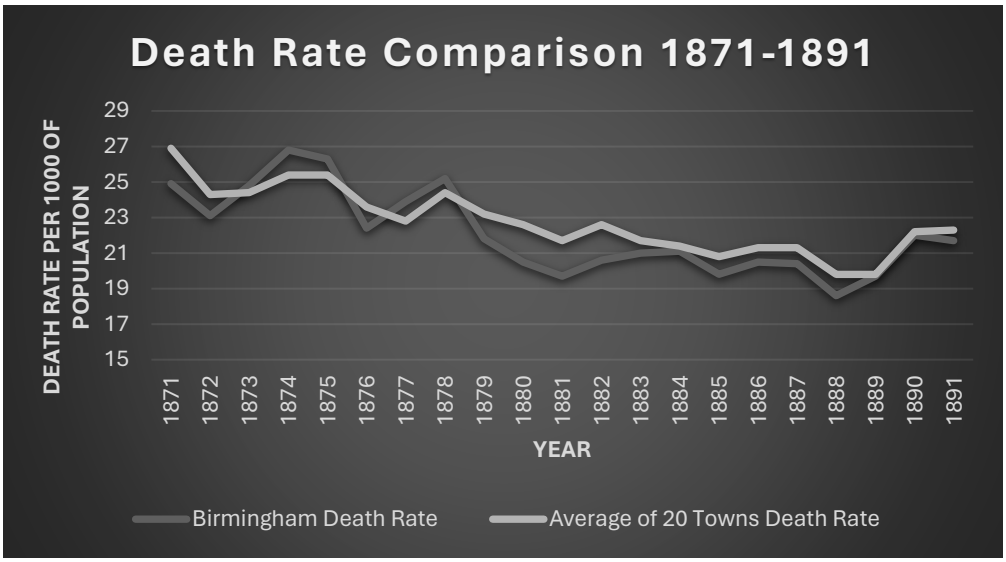


Figure 2.6: Death Rate Comparison 1871-1891: Birmingham and the average for 20 large towns.[146]

However, Avery's attempt was thwarted by other councillors who represented the interests of the local Ratepayers' and Landlords' Mutual Protection Society. They quickly mobilised as soon as details of Avery's expensive plan were known, fearful of substantially increased borough rates and additional water rates.[147] The defeat was a bitter blow to Avery and it soured his relationship with PWC councillors completely. In 1871, however, Avery's energies were instead diverted to the town's sewage crisis and another battle with those same councillors (Chapter Four).

[145] Avery, *Water Supply of the Town*, pp. 15-16.
[146] For data sets used for this comparison, see Appendix 3: Number of Deaths and Overall Death Rates for Birmingham, 1871-1921.
[147] For more detail on the 1869 attempt, see, J. Pick 'The Forgotten "Civic" Career of Alderman Thomas Avery, 1862-1892', (Unpublished MA Dissertation, University of Birmingham, 2017).

Conclusions

This chapter has explored the consequences of rapid urbanisation and industrialisation in Birmingham. It offers an example of what Luckin describes as 'cities in crisis'.[148] It has investigated local specific factors that motivated change and pinpointed that 1868 was a watershed moment in Birmingham's sanitation history.

As W. M. Fraser points out, overcrowding increased nationally between 1848 and 1868, with English census figures for 1861 suggesting a twenty-seven per cent population rise within twenty years.[149] This placed a strain on urban local resources and negatively impacted upon the environment. Birmingham may have had an ample water supply in the eighteenth century, but by the second half of the nineteenth century, this was no longer the case. Social inequalities and poverty meant many inhabitants did not have access to a constant supply of good quality water. Despite central encouragement for municipalisation, attempts in Birmingham had failed, and the waterworks remained in private hands. For some on the council, there was a lack of will, due to the large financial commitment required to make any effective changes. Local taxation was the primary source of income for the corporation, so any large-scale improvement plans were perceived by the local ratepayers as an unfair burden through rate increases payable by a proportion of the population; this issue consistently generated opposition. Consequently, any solutions attempted during this period were piecemeal and often of insufficient scale to be effective.[150] Additionally, external factors prevented change with a lack of effective legislation and an absence

[148] Luckin, *Death and Survival,* p. 170.
[149] W. M. Fraser, *A History of English Public Health 1834-1939* (London, 1950), p. 78.
[150] Hunt, *Building Jerusalem,* pp. 323-331.

of technological advancement in the treatment of sewage. Although the Sanitary Act 1866 gave more powers to deal with nuisances, it did not provide powers to close polluted wells or tackle river pollution. That said, it was the first Act to incorporate compulsory elements, placing the onus on local authorities to improve sewage treatment in towns.[151]

Despite the lack of any tangible difference in sanitary conditions, the turning point of 1868 (ahead of the Public Health Acts of the 1870s and the Chamberlain mayoralty of 1873-6) was not only significant because of a sequence of events that exposed the unsatisfactory situation in the city but also because it marked the moment when two key individuals embarked on civic reform for sanitation and public health for the next quarter of a century. Avery, a wealthy local businessman who gave up his business interests to pursue a civic career as councillor, alderman and mayor, navigated the municipal response to the sewage question. Equally important was Borough Analyst, Hill, who seized the opportunity to express his concerns about the city's polluted wells and water supply. This was an issue to which Hill devoted much of his energies as Birmingham's first full-time Medical Officer of Health (MOH) after the 1872 PHA, which subsequently placed greater responsibility on the council as an Urban Sanitary Authority.[152] However, Hill had to wait until the 1875 PHA for relevant legislative recourse to close Birmingham's polluted wells.[153]

Later chapters will look more closely at the municipal responses to the city's 'environmental sanitation' problems after this turning point.[154] However, it will first be

[151] Wohl, *Endangered Lives,* p. 155.
[152] 'Policy Navigator', *The Health Foundation* (2023) available at https://navigator.health.org.uk/theme/public-health-act-1872 [accessed 24 March 2023].
[153] See Relevant Timeline for Birmingham, p. xii of this thesis (which includes key public health legislation).
[154] Mooney, *Intrusive Interventions*, p. 19.

important to explore the political changes in the city to examine the effectiveness of Birmingham's local government at this critical turning point and beyond. Hennock identifies a change in the composition and attitude of the council by 1872, as more prosperous businessmen and professionals became councillors from 1869 onwards and gained the upper hand politically.[155] The town entered an era that has been described by Roger Ward as a 'Liberal golden age', a contention that is also explored further in the next chapter.[156]

[155] Hennock, *Fit and Proper Persons,* pp. 62, 74.
[156] R. Ward, 'Birmingham: A Political Profile, 1700-1940' in C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 159-191, pp. 171-174.

Chapter Three

Provincial Politics in Action 1860s-1890

Nineteenth-century industrialisation and urbanisation brought great physical, environmental, political, economic and social changes to Birmingham and by 1849 Birmingham was described as 'a parish, a market town and a borough' and as 'one of the most extensive manufacturing towns in England'.[1] The town only gained parliamentary representation after 1832 and then became a municipal borough through a Charter of Incorporation in 1838, with powers invested in the Corporation of Birmingham and its council.[2] By 1890 Birmingham had been granted city status and was described by American author and journalist, Julian Ralph, as the 'best-governed city in the world'.[3] If true, this suggests a remarkable transformation in local governance contrary to what had been exposed at the Social Science Congress in 1868 (Chapter Two).

Compared with the lack of historiography on mid-nineteenth-century sanitation and public health in Birmingham, much has been written about the city's political history at the time.[4] This is largely due to the impact and reputation of Birmingham MP and

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[1] R. Rawlinson, *Report to the General Board of Health on a Preliminary Inquiry into the Sewerage, Drainage and the Supply of Water and the Sanitary Condition of the Inhabitants of the Borough of Birmingham* (London, 1849), p. 5. Hereafter *1849 Report on Birmingham*.

[2] R. Ward, 'Birmingham: A Political Profile' in C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 159-169.

[3] J. Ralph, 'The Best-Governed City in the World', *Harper's Magazine*, 81, 481 (1890).

[4] For general histories of Birmingham see C. Gill, *History of Birmingham, Vol. I Manor and Borough* (London, 1952); A. Briggs, *History of Birmingham, Vol. II, Borough and City 1865-1938* (London, 1952); W. B. Stephens (ed.), 'The City of Birmingham' in *A History of the County of Warwick: Volume 7, the City of Birmingham* (London, 1964) available at https://www.british-history.ac.uk/vch/warks/vol7 [Accessed 9 February 2019]; V. Skipp, *The Making of Victorian Birmingham* (Birmingham, 1983); L. J. Jones, Public Pursuit of Private Profit? Liberal Businessmen and Municipal Politics in Birmingham, 1865-1900', *Business History*, 25, 3 (1983), pp. 240-259; C. Upton, *A History of Birmingham* (Stroud, 1993); R. Ward, *City-State and Nation, Birmingham's Political History c.1830-1940* (Chichester, 2005); P. M. Jones, *Industrial Enlightenment: Science, Technology and Culture*

statesman, Joseph Chamberlain (1836 -1914), a leading figure in late nineteenth- and early twentieth-century British politics after his rapid rise to prominence as a Liberal councillor from 1869 and campaigner for education reform.[5] Significant focal points in the historiography are the influence of 'the civic gospel' ethos (discussed later) and Chamberlain's three-year term as Birmingham's mayor, when he is considered to have established Birmingham as 'one of the most influential models for municipal socialism' through arguing that gas and water should be in public hands and that local government should secure citizens' health.[6] Recently, Richard Vinen has reiterated earlier claims that 'sanitation came to be strongly associated with a certain image of Birmingham and Chamberlain'.[7] This motivates the first research question which seeks to re-evaluate Chamberlain's influence and to explore why sanitation came to be so strongly associated with him and the city. The second research question is to test the validity of the alleged late nineteenth-century 'Liberal golden age' and its influence on the complimentary assessment made by Ralph in

in Birmingham and the West Midlands (Manchester, 2008); C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016); R. Vinen, *Second City: Birmingham and the Forging of Modern Britain* (London, 2022).

[5] For more on Joseph Chamberlain and Birmingham, see J. L. Garvin, *The Life of Joseph Chamberlain*, 6 Vols (London, 1934); P. T. Marsh, *Joseph Chamberlain: Entrepreneur in Politics* (Yale, 1994); T Hunt, 'Joseph Chamberlain and the Municipal Gospel', *Building Jerusalem: The Rise and Fall of the Victorian City* (London, 2004), pp. 313 – 380; R. Ward, *The Chamberlains: Joseph, Austen and Neville 1836-1940* (Stroud, 2015); R. Ward, 'Birmingham: A Political Profile', pp. 171-183; I. Cawood and C. Upton (eds), *Joseph Chamberlain: International Statesman, National Leader, Local Icon* (Basingstoke, 2016); A. Reekes, *Two Titans, One City: Joseph Chamberlain and George Cadbur*y (Alcester, 2017); A. Reekes, *The Birmingham Political Machine: Winning Elections for Joseph Chamberlain* (Alcester, 2018); P. Marsh with J. Pick, *'The House Where the Weather was Made': A Biography of Chamberlain's Highbury* (Alcester, 2019). See also Appendix 1: Index of Persons for brief biographies of Chamberlain and other individuals involved with the council during this period.

[6] For more on municipal or (gas and water) socialism and Birmingham, see the chapter 'Birmingham: The Making of a Civic Gospel' in Briggs, *Victorian Cities* (Middlesex, 1968), pp. 184-240; E. P. Hennock, 'Part II: The Municipal Gospel' in Book 1 Birmingham, *Fit and Proper Persons: Ideal and Reality in Nineteenth-Century Urban Government* (London, 1973), pp. 61-176; T Hunt, 'Joseph Chamberlain and the Municipal Gospel', *Building Jerusalem,* pp. 313 – 380; J. P. Gherke, 'A Radical Endeavour: Joseph Chamberlain and the Emergence of Municipal Socialism in Birmingham', *The American Journal of Economics and Sociology*, 75 (2016), pp. 23-57; R. Vinen, 'Chamberlain's Birmingham, in *Second City,* pp. 69-110.

[7] Vinen, *Second City,* p. 96.

1890.[8] This chapter also continues to explore resistance through ratepayer politics but also looks at the developing culture of local government and civic pride through civic buildings and monuments.

To begin, this chapter establishes the earlier boundaries of Birmingham and looks at local governance and the composition of the council before the turning point of 1868 (as identified by the author in Chapter Two), to gain a sense of what came before. It then examines the influence of the civic gospel before looking more closely at the municipalisation of gas and water supplies and how those events are remembered in the city. It then identifies a change in council priorities after 1879 before finally drawing answers to the research questions.

Changing Boundaries and Governance

This section revisits why Robert Rawlinson was so critical of the administrative structure of Birmingham's authorities in his 1849 report.[9] Birmingham's governance had been invested in manorial and parish administrations up to the mid-eighteenth century. After 1769, a body of Street Commissioners had powers to levy a rate for streets and lighting and, later, to provide a police force and construct public buildings.[10] The lack of a corporation in Birmingham created an environment of social and religious freedoms that encouraged economic prosperity to produce a 'city of a

[8] Ralph, 'Best-Governed City'; Ward, 'Birmingham: A Political Profile', pp. 171-174.
[9] Rawlinson, *1849 Report on Birmingham*.
[10] Stephens (ed.), 'The City of Birmingham' in *A History of the County of Warwick: Volume 7,* pp. 1-3; D. Taylor, 'Governance and Locality in the Age of Reform: Birmingham, 1769-1852' (Unpublished PhD Thesis, University of Birmingham, 2017).

thousand trades'.[11] There were also no restrictive guilds which may have stifled economic growth and diversity and Birmingham was exempt from the Clarendon Code which excluded dissenters from civic life and prevented ministers preaching. However, as Malcolm Dick points out, some of these explanations for the city's industrialisation are not completely validated by evidence.[12]

Administratively, the municipal borough was larger than the actual parish of Birmingham, as it also included the parish of Edgbaston and the hamlets of Deritend and Bordesley and Duddeston-Cum-Nechells, which were in the parish of Aston.[13] The campaign for a Charter of Incorporation was a contentious issue in Birmingham and the first years of incorporation saw the council with little power and troubled with opposition and legal challenges, while Street Commissioners continued with their separate powers.[14] As Rawlinson reported to the General Board of Health, there were eight separate authorities with different powers to attend to sanitary and public works in the entire borough. His recommendation for the work 'to be placed under one establishment' became a key objective of the Borough Improvement Act 1851, when the council took responsibility from all other authorities and invested powers in the new Public Works Committee (PWC).[15] However, the Act did not simplify

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[11] M. Dick, 'The City of a Thousand Trades, 1700-1945', in Chinn and Dick (eds), *Birmingham: The Workshop of the World*, pp. 125-157, p. 125.

[12] See E. Hopkins, *The Rise of the Manufacturing Town: Birmingham and the Industrial Revolution* (Stroud, 1989), pp. 3-22; Dick, 'The City of a Thousand Trades', p. 127. For other general histories of Birmingham, see Gill, *History of Birmingham, Vol. I*; Briggs, *History of Birmingham, Vol. II*; Skipp, *The Making of Victorian Birmingham*; Upton, *A History of Birmingham*; P. M. Jones, *Industrial Enlightenment*.

[13] See Drake's 1840 map of Birmingham divided into Wards on p. xi of this thesis.

[14] For more details on the campaign for incorporation and the difficulties after granting of the charter, see chapters III to VIII in J. T. Bunce, *History of the Corporation of Birmingham, with a Sketch of the Earlier Government of the Town, Vol. I* (Birmingham, 1878). Also, Taylor, 'Governance and Locality in the Age of Reform'; Ward, 'Birmingham: A Political Profile', p. 168.

[15] Rawlinson, *1849 Report on Birmingham,* pp. 14-15. The eight authorities included 3 separate sets of Commissioners (Birmingham, Deritend and Bordesley, and Duddeston and Nechells); Guardians of the Poor; the Municipal Corporation; Deritend Surveyors of Highways; Bordesley Surveyors; and Edgbaston Surveyors;

everything, as it was not until 1865 that the Registrar General's statistics were applied to the whole borough. Previously, only the parish of Birmingham was included, and the parishes of Aston and Edgbaston were returned with the Aston and King's Norton Unions.[16]

Figure 3.1 shows the 1857 Charles Henry Blood map of Birmingham and its environs; this helps to set the administrative borough within its regional context bordered by other self-governing parishes and townships.[17] This context is important in relation to sanitation development, as there were disputes and co-operation in equal measure between these multiple authorities over water supply, drainage and pollution (Chapters Four and Five). All authorities had to navigate waste management, environmental pollution and commercial property rights. Several of the authorities bordered the water sources of the private Birmingham Waterworks Company, which in turn supplied multiple districts in addition to Birmingham. The map also shows the company's first reservoirs, constructed in the 1830s in the Manor of Aston.

Stephens (ed.), 'Political and Administrative History: Local Government and Public Services,' in *A History of the County of Warwick: Volume 7*.

[16] Vital statistics are birth, death and marriage rates. J. T. Bunce, *The History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885) p.110.

[17] The 1857 map shows that Birmingham was surrounded by the Manor of Aston, the Townships of Harborne, Smethwick, Handsworth and Perry Barr and the Parishes of Kings Norton, Halesowen, Northfield and Yardley. It also shows all within their county boundaries of Staffordshire, Warwickshire and Worcestershire.

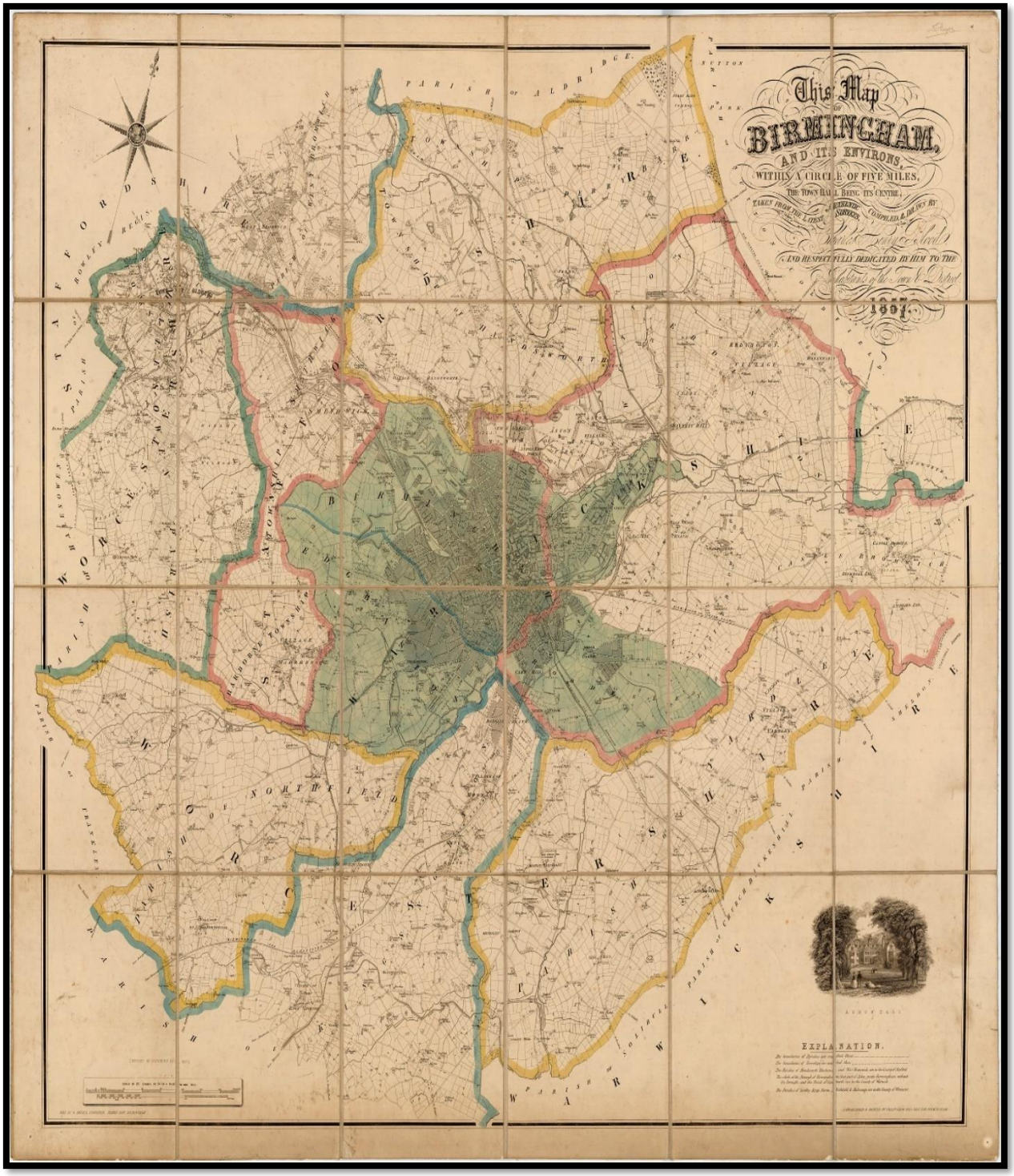


Figure 3.1: Map of Birmingham and its Environs 1857.
Image from the Map Room, School of Geography, Earth and Environmental Sciences, University of Birmingham.

Birmingham as a borough was initially divided into thirteen wards, but this increased to sixteen by 1873.[18] Rawlinson's 1849 report explained that ten of the wards were in the parish of Birmingham, with one ward in each of the other districts within the borough. He listed the total population in the ten wards of Birmingham parish as 138,210. The breakdown per ward in 1849 was as follows: Ladywood, 8,787; All Saints, 13,719; Hampton, 11,037; St George's, 19,648; St Mary's, 13,323; St Peter's, 16,773; St Martin's, 13,323; St Thomas's, 18,254. The governing council consisted of sixty-four members which included forty-eight elected ward councillors, plus sixteen aldermen who were elected internally by the council. A mayor was chosen each year in November.[19] Between 1873 and 1890 the boundaries and wards remained unchanged, but city status was granted in 1889. Thereafter the boundaries of the city began to extend from 1891 but more significantly in 1911 when many of the surrounding parishes and townships (as seen in Fig. 3.1) were incorporated under the Greater Birmingham Act of 1911 (see Fig. 3.2), increasing the city's population (see Appendix 3).[20]

[18] See p. xi of this thesis for Drake's 1840 map showing the 13 wards, Birmingham Archives and Collections, Library of Birmingham (BAC), MAP/524282. See also Chapter 2, p. 52 for the sanitary census of 1875 which lists the 16 wards. Balsall Heath ward and Saltley ward were added in 1891, bringing total of wards to 18 and therefore incorporated the parishes of Harborne and King's Norton.

[19] For more details on the wards of Birmingham, see Bunce, *History of the Corporation II*, p. 11 and Stephens, 'Political and Administrative History: Local Government and Public Services,' in *A History of the County of Warwick: Volume 7*, pp. 318-353. An alderman is a co-opted member of the council, and hence not subject to municipal elections.

[20] See Relevant Timeline, p. xii of this thesis for details of boundary extensions up to and including 1911 (Greater Birmingham Act). In 1928 most of Perry Barr Urban District was incorporated. Also see useful blog including images of maps, G. Burns, 'Birmingham Boundaries', *The Iron Room Blog*, posted on 9 Sept 2019 https://theironroom.wordpress.com/2019/09/09/birmingham-boundaries/ [accessed 8 April 2023]. The 1892 map by city surveyor W. S. Till included in this piece shows all the wards. Appendix 3 includes population figures.

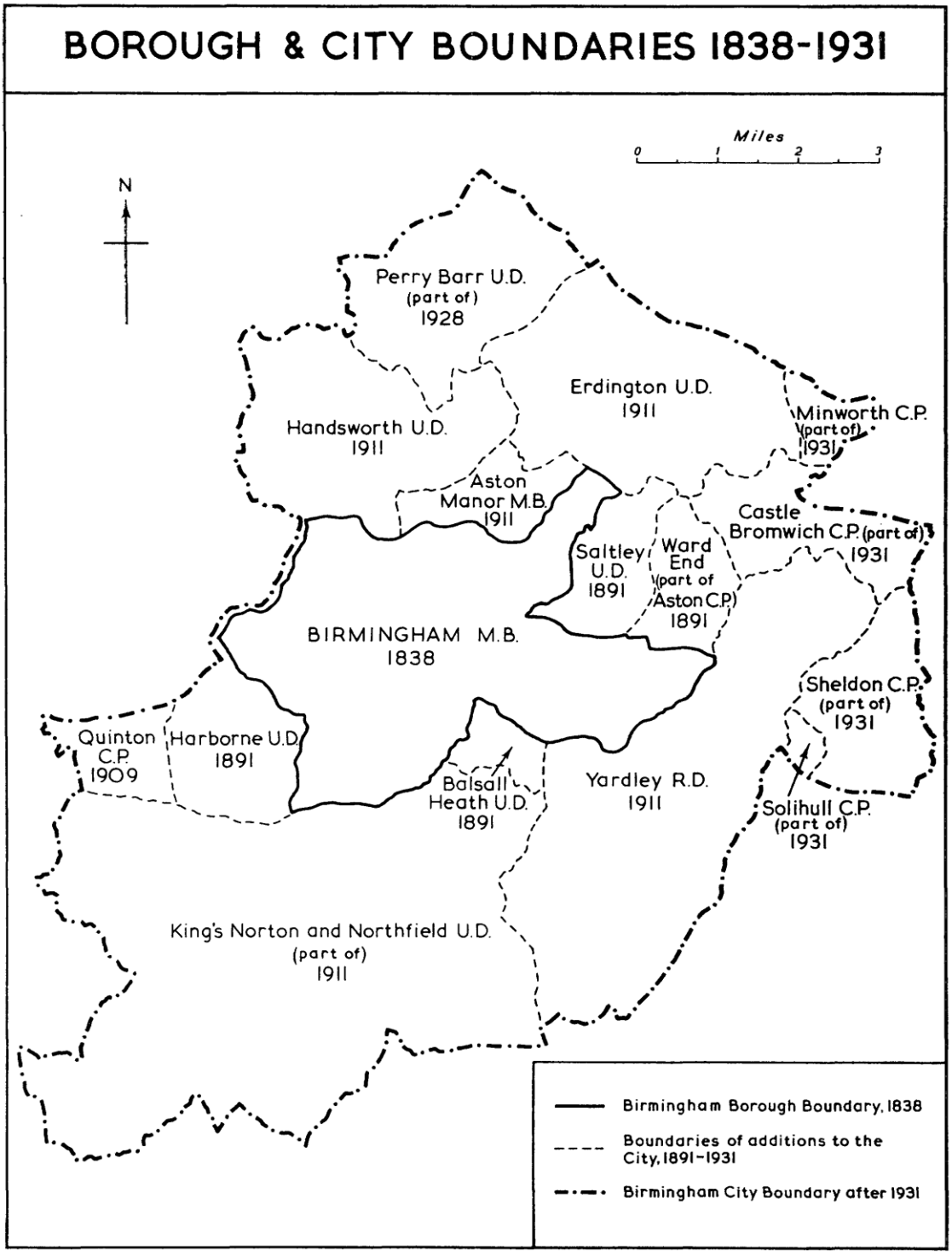


Figure 3.2: Borough and City Boundaries 1831-1931

Reproduced with permission from *A History of the County of Warwick: Volume 7, the City of Birmingham* (London, 1964). Victoria County History © University of London

Council Composition and Influences

E. P. Hennock's pre-eminent study of municipal development and reform in Birmingham and Leeds examined the composition (by occupation) of Birmingham's council between 1838 and 1914.[21] The men who served on local authorities were entrusted with local finances and were empowered to make decisions on behalf of the population.[22] Those who were elected brought with them political commitments, allegiances and agendas. As more obligations were placed upon local authorities to address public health, the composition and influences on the council are revisited to explore the main research questions for this chapter.

Hennock highlighted a distinct change in composition very soon after the transition of powers in 1852, when those on the council from the economic and social elite (who had primarily made up the Commissioners) declined in quantity. Another observation was that the number of small business owners, particularly from the drink trade, increased. In 1862 there were five large business owners, twenty-one small business owners and five from the drink trade but not one from the medical professions.[23] In the mid-to-late-Victorian period, control of the drink trade and public health were important local issues. Local battles between the temperance movement and the drink trade encouraged both sides to engage in municipal politics and sit on the council.[24]

[21] Hennock, *Fit and Proper Persons*. Under the 1835 Municipal Corporations Act for election to a borough council, candidates had to be on the burgess roll and satisfy a property qualification. For more details on recruitment and qualification, see Hennock, *Fit and Proper Persons*, pp. 10-14.
[22] Women could not be elected to county or borough councils until 1894, although they could serve on School Boards after 1870.
[23] Hennock, *Fit and Proper Persons*, pp. 27, 34.
[24] Hennock, *Fit and Proper Persons*, p. 35.

Other factors also affected composition. According to Bunce, the hostilities in Birmingham over the Reform Act, the Charter of Incorporation, Chartist riots and fears over centralisation with the adoption of the Public Health Act 1848, discouraged 'influential citizens' from joining the council and 'taking their share in local government'.[25] What followed in Birmingham was a period of parsimony and 'ratepayer politics' when a network of ratepaying small business owners and landlords gained control of the council. The group came to be known as the 'Economists' due to their main objective of keeping the borough rates low under their first leader, local journalist Joseph Allday.[26] As the borough rates were the single source of income for the council at that time, any expensive improvement schemes were immediately perceived as rate increases. This situation was not unique to Birmingham: there were numerous associations of ratepayers and landlords around the country to combat this perceived threat, but in Birmingham, the group was particularly effective in preventing or diminishing any potentially expensive plans.[27]

The Economists' primacy coincided with rapid urbanisation and growing concern over public health at a time when reformers were advocating greater expenditure to cope with the environmental consequences of growth. Significantly, members of the Economist group gained positions on the PWC, which suggests that they had a strategy of gaining key committee positions to extend influence over any expensive improvement plans. A particular example of their impact was the curtailing of

[25] Bunce (1885) cited in Ward, 'Birmingham: A Political Profile', p. 168.
[26] For more about Joseph Allday and the Economists, see Briggs, *Victorian Cities*, pp. 209-214; Bunce (1885) cited in Ward, 'Birmingham: A Political Profile', p. 168. For ratepayer politics, see V. Taylor and F. Trentmann, 'Liquid Politics: Water and the Politics of Everyday Life in the Modern City', *Past and Present*, 211 (2011), pp. 210-241, p. 220.
[27] For an example of ratepayer politics in action, see Taylor and Trentmann, 'Liquid Politics'.

improvement plans under the 1851 Improvement Act, for which costs had been seriously underestimated. The proposed increase to the rates was simply not acceptable to the ratepayers' association and the Economists and a bitter, but ultimately successful, campaign to curtail the plans and in effect seize power on the council was co-ordinated. It resulted in a diminished version of surveyor John Pigott Smith's scheme for drainage and improvements to paving.[28] The conflict and bad feeling between Pigott Smith and the PWC resulted in the surveyor's dismissal and his apprentice being appointed in his place at a much lower salary.[29]

That is not to say that there was no expenditure on public works. As Appendix 2 shows, much expenditure was directed at the building and maintaining of roads, along with the cleansing and watering of principal roads. This suggests that ratepayers and their Economist representatives on the council were happy to support projects that were of benefit to trade and commerce rather than public utilities for all. Allday was no longer part of the council after 1859 but this study found, in agreement with Leslie Rosenthal, that the Economist network continued long after Allday's departure: their influence was felt until the mid-1870s.[30]

As detailed in the previous chapter, there were poor conditions in many parts of the city and Birmingham had fallen behind its urban counterparts, such as Liverpool and Leeds, in terms of sanitary improvements. Yet, just over twenty years later, Ralph

[28] John Pigott Smith was surveyor to the Street Commissioners and continued as borough surveyor from 1852 to 1857. See Appendix 1: Index of Persons for short biographies on council surveyors. The actual hand-written outline for Pigott Smith's 1857 drainage scheme can be found at Cadbury Research Library Special Collections, University of Birmingham (CRLSC) within the Bunce Collection, BU/26, in the folder of J. T. Bunce's notes for the *History of the Corporation of Birmingham*.
[29] Hennock, *Fit and Proper Persons*, pp. 31-34.
[30] L. Rosenthal, 'Joseph Chamberlain and the Birmingham Town Council, 1865–1880', *Midland History*, 41, 1 (2016), pp. 71-95.

declared that Birmingham was 'the best-governed city in the world'.[31] This raises the question as to what caused such a reversal of fortunes for the administration and the way the city was perceived. We shall now turn to look at socio-political influences.

Key Influences: Liberalism and the Civic Gospel

Roger Ward identifies a political turning point in the city with the formation of the Birmingham Liberal Association (BLA) in 1865 and the start of the 'Liberal golden age'. Significantly, the BLA developed a co-ordinated election-winning strategy with committees in each ward.[32] Labelled the 'caucus', it demonstrated the strategy's success in 1868, defeating the Conservatives to see three Liberal MPs elected for Birmingham. Its strategy was imitated elsewhere and became an influential model for modern political organisation. The caucus marked the rise of liberalism in the city, particularly among the nonconformist elite who had coalesced around a campaign to remove inadequate education provision and the compulsory teaching of Anglican religion.[33] The education campaign that began in Birmingham and established the National Education League (NEL),[34] propelled local businessman councillor, Joseph Chamberlain, into the national political arena,[35] and members of the BLA moved to assume control of Birmingham's governing institutions.[36] Simon Szreter discusses

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[31] Ralph, 'Best-Governed City'.
[32] Ward, 'Birmingham: A Political Profile', pp. 172-1788. The architect, William Harris is considered to have formulated this strategy. See also Appendix 1: Index of Persons; Reekes, *Birmingham Political Machine*, pp. 17-18.
[33] Their ambition went beyond the local, just as the Birmingham Political Union and Manchester's Anti-Corn Law League had before them. The campaign played out significantly in the city with the BLA and the National Education League (NEL) gaining nation-wide attention and influencing government policy. For more about the BLA and NEL, see Briggs, Hunt, Hennock, Reekes and Ward, as detailed in footnotes 5 & 6.
[34] Ward, 'Birmingham: A Political Profile', pp. 173-174.
[35] For a full political biography, see Marsh, *Entrepreneur in Politics*.
[36] Ward, 'Birmingham: A Political Profile', pp. 172-178; Ward, *City-State and Nation*. Also, for more detail on political situation in Birmingham 1865-1873 and the campaign over education, see Hennock, *Fit and Proper Persons,* pp. 80-103. For more detail about the council networks during the period 1865-1880, see Rosenthal, 'Chamberlain and the Birmingham Town Council'.

the politics of public health and highlights the importance of the Second Reform Act 1867 with the extension of male suffrage to all male householders in towns and to tenants paying more than £10 a year in rent. This enfranchised many of the 'non-ratepaying segments of the manual working classes' and urban politicians had to positively engage the new voters in local and national elections.[37]

Correspondingly, the composition of the council changed as more of the city's economic and social elite were elected. Hennock found that in 1862, large business owners made up only 7.8 per cent of the council, whereas small business owners made up over 32 per cent. By 1882, this pattern had been reversed, when men from larger businesses made up over 23 per cent of the council, whereas the proportion of small business owners was reduced to 17.2 per cent. Significantly, by 1882, four medical professionals had also joined the council.[38]

However, members of Birmingham's nonconformist elite were not only engaged with Liberal politics but also with the civic gospel, and the two strands were essentially interlinked.[39] The civic gospel was a religiously inspired ethos to do good practical work, through the power vested in local government, to make administrative, educational and social reforms.[40] It was associated with three nonconformist preachers in Birmingham, George Dawson (initially a Baptist), Robert Dale (Congregational) and Henry Crosskey (Unitarian), although the acknowledged

[37] S. Szreter, 'Economic Growth, Disruption, Deprivation, Disease, and Death: On the Importance of the Politics of Public Health for Development', *Population and Development Review,* 23, 4 (1997), pp. 693-728, p. 710.
[38] Hennock, *Fit and Proper Persons*, p. 34.
[39] See the chapter 'Birmingham: The Making of a Civic Gospel' in Briggs, *Victorian Cities*, pp. 184-240. Also, the chapter, 'The Influence of George Dawson' in Hennock, *Fit and Proper Persons*, pp. 61-79.
[40] R. Tudur Jones, 'Dale, Robert William', *Oxford Dictionary of National Biography* (*ODNB)* 03 October 2013, https://doi.org/10.1093/ref:odnb/7015 [5 September 2020].

'prophet' was Dawson.[41] Born in London, he arrived in Birmingham in 1844 at the Mount Zion Baptist Chapel. Dawson was less influenced by evangelicalism but still had a spiritual message and his preaching was noted for his more 'conversational' manner and soon many others from all Birmingham's nonconformist communities came to hear him. Dawson eventually spilt from the Baptist Chapel and in 1847 his admirers built him his own church, the Church of the Saviour, with a capacity for 1,600 and 800 seat holders, such was his popularity.[42]

From his own platform, without restriction, Dawson could preach about anything he wanted and his key message was the encouragement of his congregation to offer their 'talents to the service of the city', for the benefit of all citizens.[43] His lead was followed by Dale and Crosskey who also encouraged their congregations, and not just those with a good family name, but those who could offer practical professional expertise in medicine or law.[44] Matters of finance did not conflict with the religious principles of the civic gospel; in fact Dale was fond of saying, 'the 11th Commandment is that thou shalt keep a balance-sheet'.[45] There may have been denominational differences between the three preachers, but they shared the common bond of liberalism and political activism through active participation in education reform and

[41] I. Sellers, 'Dawson, George (1821-1876)', *ODNB*, available at https://doi.org/10.1093/ref:odnb/7347 [accessed 5 September 2020]; Tudur Jones, 'Dale, Robert William (1829-1895)'; A. R. Vogeler, 'Crosskey, Henry William (1826-1893)', *ODNB* available at https://doi.org/10.1093/ref:odnb/38868 [accessed 5 September 2020]; Hennock, *Fit and Proper Persons*, p. 62.
[42] Briggs, *Victorian Cities*, pp. 195-196; S. Roberts, *George Dawson and the Church of the Saviour* (Birmingham, 2020), pp. 1-2.
[43] Briggs, *Victorian Cities*, p. 196.
[44] Dawson and Dale encouraged Thomas Avery to join the council in 1862 (Avery was a congregationalist and a member of Dale's congregation at Carr's Lane). For example, in an 1867 sermon Dale encouraged prosperous members of his congregation to '[…] to feel "called of God" to act as "Guardians of the Poor". They ought to work on the committees of the hospitals. They ought to be aldermen and town councillors.' R. W. Dale, *Week-Day Sermons,* cited in A. Reekes, *Speeches that Changed Britain: Oratory in Birmingham* (Alcester, 2015), p. 60.
[45] Dale cited in Hunt, *Building Jerusalem*, p. 253; Vogeler, 'Crosskey, Henry William', *ODNB*.

local elections. Dawson is best remembered for the establishment of public libraries, education reform, and the rise of Chamberlain and the Liberal Party. His influence continued after his death in 1876 through Dale, a key individual in the BLA and heavily involved in all aspects of municipal life, despite not being eligible for election.[46] Crosskey was particularly active in educational and social reforms and a leading member of the city's School Board.[47]

Derek Fraser rightly points out that Birmingham's civic gospel did not necessarily preach new ideas; the program of improvements and municipalisation that followed had 'all featured in the municipal history of other towns' much earlier.[48] What Birmingham's civic gospel did was to draw together a group of like-minded elites who shared common bonds of religious nonconformity and Liberal politics (with a few notable exceptions) to make changes and improve the city. Its influence was evident in the fact that seventeen congregation members of the Church of the Saviour went on to be elected councillors. Dawson's philosophy and preaching were successful in changing the composition of the council.[49] In contrast to other towns and cities, what was exceptional in Birmingham was the pace of change, which has largely been credited to Chamberlain's ambition and momentum.[50] All that said, in agreement with Andy Green, it is not the intention of this thesis to perpetuate this 'largely benevolent and altruistic version of the civic gospel.[51] The individuals referred to throughout this

[46] Tudur Jones, 'Dale, Robert William'.
[47] Vogeler, 'Crosskey, Henry William'.
[48] D. Fraser, *Power and Authority in the Victorian City* (Oxford, 1979), p. 101. See Joseph Chamberlain in Appendix 1: Index of Persons, and P. T. Marsh, 'Chamberlain, Joseph [Joe] (1836-1914)', *ODNB*, available at https://doi.org/10.1093/ref:odnb/32350 [accessed 19 December 2023].
[49] Sellers, 'Dawson, George'.
[50] Ward, 'Birmingham: A Political Profile', p. 174.
[51] A. Green, ''The Anarchy of Empire': Reimagining Birmingham's Civic Gospel', *Midland History*, 36, 2 (2011), pp. 163-179, p. 168.

thesis, for all their years of service in local government and good works for the city, should also be remembered within the context of Victorian society and its corresponding attitudes to race, empire, class and gender. As Green argues, there is a need to re-evaluate the civic gospel and the prophet Dawson. Although Dawson preached reform for all classes, Green highlights some of Dawson's language in his speeches, with its overall tone of civilising superiority over others.[52] For Chamberlain, the person who is often credited as the one who took the civic gospel from 'an ideal to a reality', there is the later contentious imperial legacy when he served as Colonial Secretary (1895-1903).[53]

The Liberal dominance of Birmingham's council lasted throughout the 1870s and for most of the 1880s, until political differences over Irish Home Rule split the party and devastated the BLA.[54] This period saw physical change as well, with new civic and public buildings and monuments. Simon Gunn describes the 'memorialising in stone' within the civic squares of the city (Victoria Square, Chamberlain Place) as a monument itself to 'the city's municipal revival'.[55] Key physical landmarks included: the Central Reference Library in 1866; the building of new schools and a new Council House (the foundation stone laid by Chamberlain in 1874); and the Museum and Art Gallery and the Municipal School of Art (both 1885). Similarly, key individuals and events are also linked to this age, with the rise of Chamberlain and his celebrated mayoralty of 1873-6 during which parliamentary acts for the municipalisation of gas

[52] Green, 'Reimagining Birmingham's Civic Gospel', pp. 165-169.
[53] Hunt, 'Joseph Chamberlain and the Municipal Gospel', *Building Jerusalem*, pp. 313 – 380, p. 331.For a work that looks at legacy and reputation, see Cawood and Upton (eds), *Joseph Chamberlain: International Statesman*.
[54] For more detail, see Ward, 'Birmingham: Political Profile', pp. 171-179.
[55] S. Gunn, *The Public Culture of the Victorian Middle Class: Ritual and Authority in the English Industrial City 1880-1914* (Manchester, 2007), p. 51.

and water supplies for the city and an Improvement Scheme were passed.[56] These individuals were also memorialised in stone with 'shrines' to Chamberlain, Dawson and Josiah Mason.[57]

There is no denying that during the period 1869 to 1884, the council spent money on behalf of the ratepayers. The municipal debt increased from £588,000 to £7.4 million with municipalisation of gas and water, the Improvement Scheme and sewage works (Chapter Four). The new Council House and Museum and Art Gallery totalled over £200,000.[58] Another aspect attributed to this period is that the city's overall death rate fell from 26.8 per 1000 of the population to 19.8 by 1885, with John Thackray Bunce proclaiming in the *History of the Corporation* (*Vol. II*) that, 'there could be no better record of progress than this great reduction of the death-rate'.[59] Collectively, these changes could all be perceived as an impressive roll call of achievements, and yet the city still required better sanitation and those living in back-to-backs continued to endure poor sanitary conditions. The overall decline in the city's death rate has been used to portray success and progress, yet the council was fully aware that the death rates within each ward of the city revealed an entirely different story. As Fraser noted, the Sewage Inquiry of 1871 offered 'the first serious evidence on differential death rates' within the city.[60] The following section will consider more closely Chamberlain's

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[56] A. Green, 'Civic Gospels: Networks for Social Change', Birmingham Stories: Research Guide, *Connecting Histories*, available at http://www.connectinghistories.org.uk/wp-content/uploads/2015/07/bs_rg_civic_gospels.pdf [accessed 6 September 2020].
[57] Gunn, *Public Culture*, p. 51. Josiah Mason established Mason College, the predecessor college to the University of Birmingham see 'Our Heritage', *University of Birmingham* (2023) https://www.birmingham.ac.uk/university/history-and-heritage/our-heritage.aspx [accessed 23 December 2023]. You can see Mason College in the background of Figure 3.6.
[58] Gunn, *Public Culture*, p. 43.
[59] J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885), p. xxx. See also Appendix 3: Number of Deaths and Overall Death Rates 1871- 1921. For more on Bunce see Reekes, *Birmingham Political Machine*, pp. 116-118.
[60] Fraser, *Power and Authority*, p. 105.

mayoralty between 1873-6, and will assess the nature and importance of the acts of municipalisation that are considered to be key features of this alleged golden age.

Gas and Water Socialism: Reasons for Municipalisation

John Hassan's study of the development of the nineteenth-century water industry suggests a mixture of ideological and economic motivations for bringing utilities under local authority control, mainly to improve public health and for municipal trading. However, it was also a period of 'expanding local government functions', despite no compulsory legislation by central government.[61] In comparison with other large towns, Birmingham was late to gas and water supply municipalisation.[62] Municipal trading was certainly the motivation for Chamberlain's scheme to take over Birmingham's two gasworks companies, following in the footsteps of Manchester, Leeds and Glasgow.[63] The water supply understandably receives greater attention in this thesis, but the municipalisation of the gasworks was also important. Not much attention had ever been paid in Birmingham to purchase the gas supply, but Chamberlain successfully convinced a nervous council that this expensive scheme would reap rewards. The profits generated in the first year far exceeded expectations

[61] J. A. Hassan, 'The Growth and Impact of the British Water Industry in the Nineteenth Century', *The Economic History Review,* 33, 4 (1985), pp. 531-547, p. 537; Szreter, 'Economic Growth', p. 708; G. O'Hara, *The Politics of Water in Post-War Britain* (London, 2017), p. 9. Central government demonstrated its support of utilities in local government hands with the Gas and Water Facilities Act 1870 (and amendment in 1873), which allowed authorities to maintain and construct gasworks and waterworks, but only if there was no existing company or other body with the authority of an Act of Parliament already in place. Powers to compulsorily purchase a waterworks could only be obtained through an Act of Parliament until the Public Health Act 1875 ultimately granted powers.

[62] Briggs, *Victorian Cities*, p. 224. Council attempts to pursue the idea of purchasing the waterworks in 1854 and 1869 were successfully curtailed through ratepayer action.

[63] Briggs, *Victorian Cities*, p. 217. Manchester built a gasworks in 1817, Leeds took over Gaslight Company in 1870 and Glasgow acquired its gas company in 1869.

and Chamberlain was hailed as 'the Wizard of the Gas'.[64] For the council it was a financially significant change, removing the reliance on borough rates as the sole source of income. Funds from the gas helped pay for more improvements and were used for rate relief which proved popular with the ratepayers. The purchase also placed the council on a far better financial footing with reserve funds.[65] It was a gamble for Chamberlain, but it established his reputation as a successful and dynamic politician in the city. It was also the first example of what journalist Ralph, attributed Birmingham's new style of governance to; a 'business city, run by businessmen'.[66]

As for water supply, Bolton's local authority had purchased the town's existing waterworks in 1847 after years of political differences and conflicting interests.[67] That same year, Liverpool Corporation also removed its town's supply from private companies.[68] Many other local authorities followed suit but there was one notable exception; in London the water supply remained in the hands of private companies until the early twentieth century.[69] Hence, water supply was often a source of friction and, as mentioned in Chapter Two, establishing a waterworks in Birmingham had

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[64] Hunt, *Building Jerusalem*, pp. 338-340; G. J. Sershall, cartoon 'The Wizard of the Gas', *The Dart*, 8 February 1879 reproduced in S. Roberts and R. Ward, *Mocking Men of Power: Comic Art in Birmingham 1861-1911* (Birmingham, 2014), pp. 38-39.
[65] Hennock, *Fit and Proper Persons*, pp. 117-21; Marsh, *Entrepreneur in Politics*, pp. 83-90.
[66] Ralph, 'Best-Governed City'.
[67] J. Hassan and P. Taylor, 'The Politics of Water in Early and Mid-Victorian Britain: The Experience of Bolton', *Transactions of the Historic Society of Lancashire and Cheshire*, 148 (1998), pp. 119-145.
[68] S. Sheard, 'Water and Health: The Formation and Exploitation of the Relationship in Liverpool, 1847-1900 ', *Transactions of the Historic Society of Lancashire and Cheshire*, 143 (1993), pp. 141-163, pp. 141-2, 163. The trend continued and by the end of the century, out of the twenty-nine British towns with populations over 100,000, only six were still supplied by private companies.
[69] A. Hardy, 'Parish Pump to Private Pipes: London's Water Supply in the Nineteenth Century', *Medical History*, Supplement No. 11 (1991), pp. 76-93, p. 92. For a thesis exploring why London never municipalised, see J. Broich, 'Water and the Modern British City: The Case of London, 1835-1903' (Unpublished PhD Thesis, Stanford University, 2005).

previously met with resistance.[70] Right from the start there had been opposition to 'an organised water supply' when attempts made in 1808 and 1810 were opposed on the grounds that it was 'unnecessary' and due to 'private pump' interests. The landlords who provided a shallow well with a hand pump for their tenants did not want or see the need to pay charges for a piped supply. Private efforts persisted and in 1826 Birmingham Waterworks Company obtained an Act of Parliament, but the supply did not begin until 1831 with only forty-one customers.[71]

By the 1850s there were calls to take over the company's waterworks, but the council missed its earliest opportunity to municipalise when the legal authority for compulsory purchase as part of the 1851 Improvement Act lapsed. There was an attempt in the wake of the 1854 gas tank accident amid concerns over quality with the complaints over sewage discharge into the River Tame. The submission of a draft bill from the council for the purchase of the waterworks and 'to levy a water rate' provoked firm ratepayer resistance and rejection at the town meeting stage.[72] From the perspective of the 'consumer', piped supplies generated discontent through the scale of charges, the classification of 'domestic', and unreliability of supply (especially if reputedly constant).[73]

The next opportunity was in 1869 with Avery's proposal: again, it met with resistance, but for different reasons. In 1854 opposition had simply been about stopping the purchase and the levy of a water rate, but in 1869 there were other factors at play.

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[70] Hennock, *Fit and Proper Persons*, p. 121.
[71] Bunce, *History of the Corporation II*, pp. 395-396. The introductory report of engineer, Mr Ralph Dodd, on the intended Birmingham waterworks in 1808 can also be found in Bunce, *History of the Corporation II*, pp. 451-454.
[72] Bunce, *History of the Corporation II*, pp. 401-405; City of Birmingham Water Department, *History of the Water Department* (Birmingham, 1974), p. 5; Taylor and Trentmann, 'Liquid Politics', p. 209.
[73] Taylor and Trentmann, 'Liquid Politics', pp. 205, 211.

Purchase costs were still a factor, and Avery's calculations included the balance sheet of the waterworks company valued at just over £1 million. Such huge sums of money motivated Economist resistance, plus the fact that the proposed Act would give 'the power to levy two rates on account of the water supply'.[74] However, there were also internal power and class struggles within the council at this time when the Economist hold on the council was being challenged by the newly elected civic gospel councillors.[75] The PWC had the responsibility for water fountains and water for street cleansing and so regarded water as their responsibility. As the accounts for 1870 show (Appendix 2), the cost of water for streets was £1100.00 and the costs of labour, horses and carts for cleansing and watering the streets came to £11,657.00.[76] Here was Avery, acting alone without consulting the PWC, coupled with the fact that Avery was a member of Birmingham's wealthy elite, a well-respected large business owner used to dealing with such large sums of money. Avery was also a director of Birmingham Joint-Stock Bank and head of the council's Finance Committee, tasked with looking into the council's finances.[77] After the deliberate scuppering of Avery's scheme, the PWC then approached the private waterworks company themselves, a move signalling that the intention was not to stop the purchase, but instead to gain control of it. The Economist faction had likely realised that municipalisation was inevitable in line with other authorities, but their strategy was to control the situation and protect local ratepayers' and landlords' interests. Their aim was to negotiate a

[74] BAC L43.3/31078T. Avery, *The Corporation of Birmingham and the Water Supply of the Town: A Statement Addressed to Members of the Town Council* (Birmingham, 1869), pp. 22-23, 27; Marsh, *Entrepreneur in Politics*, p. 89.
[75] For more about Avery's relationship with Economist councillors, see J. Pick, 'The Forgotten 'Civic' Career of Alderman Thomas Avery, 1862-1892' (unpublished MA Dissertation, University of Birmingham, 2017), pp. 44-47.
[76] BAC, Birmingham City Council Collection, BCC1/AO/1/1/7, Public Works Committee Minutes 1866-1870.
[77] Pick, 'The Forgotten 'Civic' Career', p. 63.

much lower purchase price than the one Avery had calculated as fair, and then to control the setting of a favourable rate for property owners. In the end neither scheme prevailed and the waterworks remained in private hands.[78]

The next – and this time successful – attempt began in December 1874 when Chamberlain, as mayor, put forward a proposal to prepare an act for the compulsory purchase of the waterworks (he had proposed the gasworks purchase the year before). In contrast to the municipal trading motivations for purchase of the gasworks, the argument for purchase of the waterworks was based solely on sanitation and health, just as it had been in Avery's 1869 proposal.[79] In contrast to Avery's text and statistical tables and calculations, Chamberlain used his platform as mayor to make a speech including key facts about cholera and typhoid and the opinions of medical professionals. Chamberlain did not say anything new on matters of public health, but he used his oratorical skills to recapitulate Dr Alfred Hill's 1868 paper, Avery's 1869 pamphlet and the Royal Commission conclusions. However, he did add one argument to appeal to the concerns of ratepayers and their representatives. He reasoned that with the coming powers to close polluted wells, because of the 1875 Public Health Act (PHA), profits would immediately be sent to the company and shareholders rather than being used for the betterment of the city. He also correctly emphasised that further delay over what was inevitable would cost the city, and therefore ratepayers, more money, highlighting that the company's shares had increased by £184,000 on their market value in 1869.[80] Although the Economists

[78] Bunce, *History of the Corporation II*, pp. 404-406.
[79] Briggs, *Victorian Cities*, p. 217; O'Hara, *Politics of Water*, p. 9.
[80] *A Short History of the Passing of the Birmingham Corporation Gas Act and Water Acts 187*5 (Birmingham, 1875), pp. 51-68; Hennock, *Fit and Proper Persons*, pp. 122-123. As Marsh points out, Chamberlain and Avery, being used to large scale business, understood that the forced closure of polluted wells would increase the

accepted the plan to purchase the waterworks, this may have served to counter any potential ratepayer politics at a town meeting.

Chamberlain relished the challenge of getting a resolution passed but, as discussed, the odds were already stacked in his favour for the passing of this resolution through the council. There had been an epidemic of smallpox in Birmingham in 1874 and minds were again focused on public health and particularly on the town's polluted wells. As Chamberlain highlighted in his speech to the council, the coming of the 1875 PHA was significant because it would grant powers to close polluted wells. He argued that under their obligations as an Urban Sanitary Authority, a notice to close a well was tantamount to sending money to the waterworks company. As a businessman, this did not make sense to Chamberlain and equally it challenged his vision of what a local authority should be: 'local parliaments, supreme in their special jurisdiction'. The council in 1874 had no influence over the waterworks' scale of charges, quality or future supply. This reasoning, made on the grounds of good business, conveniently fed into the same arguments presented by others on the grounds of public health: the control of any public necessity should be in the hands of a representative body.[81] This is illustrative of the general truth, formulated as follows by Simon Szreter: 'often only when key local businessmen could see a commercial advantage was an initiative taken'.[82] Hence, although the compulsory take-over of the waterworks was framed by the benefit to the public health of citizens, financial

commercial worth of the waterworks company through its monopoly, leaving the council no choice as the Sanitary Authority, to direct thousands more houses for the company to serve. Marsh, *Entrepreneur in Politics*, p. 89.

[81] *A Short History of the Passing of the Birmingham Corporation Gas Act and Water Acts 187*5; Marsh, *Entrepreneur in Politics*, p. 84.

[82] Szreter, 'Economic Growth', p, 708.

and power motivations were also at play here.[83] As a large consumer of waterworks water itself and with its new obligations as a sanitary authority, it made financial sense for the council to be in control. This interplay between economic and public health concerns in Birmingham is an example of how 'the desire for public control' resulted in public ownership.[84] With their connection as former large-scale businessmen, this was where Chamberlain, at that point a Liberal, and Avery, a moderate Conservative, came together: an example of what Linda Jones describes as a 'justification for policies […] couched in business and not political terms'.[85] Birmingham Waterworks Company was a profitable business in which shareholders enjoyed a return of between seven and eight per cent. That fact, coupled with the anticipated increased revenue from the closure of polluted wells, motivated strong objection from the company to the compulsory purchase.[86] Both Chamberlain and Avery presented at the subsequent parliamentary hearings, which found in the council's favour upon the stipulation that the shareholders received a fair market price. Once the Act was passed, Avery took the lead, as he had been ready to do in 1869, and negotiated the purchase price on behalf of the council. As the councillor who had most desired the take-over, he was then immediately elected without opposition as Chair of the new Water Committee (1875-1887).[87]

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[83] M. Brown and C. Kelly, 'Authority' in J. Reinarz (ed.), *A Cultural History of Medicine in the Age of Empire* (London, 2021), pp. 199-218.
[84] B. Millward, 'Emergence of Gas and Water Monopolies in Nineteenth-Century Britain: Contested Markets and Public Control', in J. Foreman-Peck (ed.), *New Perspectives on the Late Victorian Economy: Essays in Quantitative Economic History, 1860–1914* (Cambridge, 1991), pp. 96-124, p. 97.
[85] L. Jones, 'Public Pursuit of Private Profit', p. 245.
[86] CRLSC, rL343.B6, C. E. Matthews, *The Water Supply of Birmingham: A Paper read before the British Association for the Advancement of Science* (Birmingham, 1886), p. 19.
[87] The agreed terms were perpetual annuities of £54,491 and a cash payment of £3,022. See Bunce, *History of the Corporation, II*, pp. 412-414.

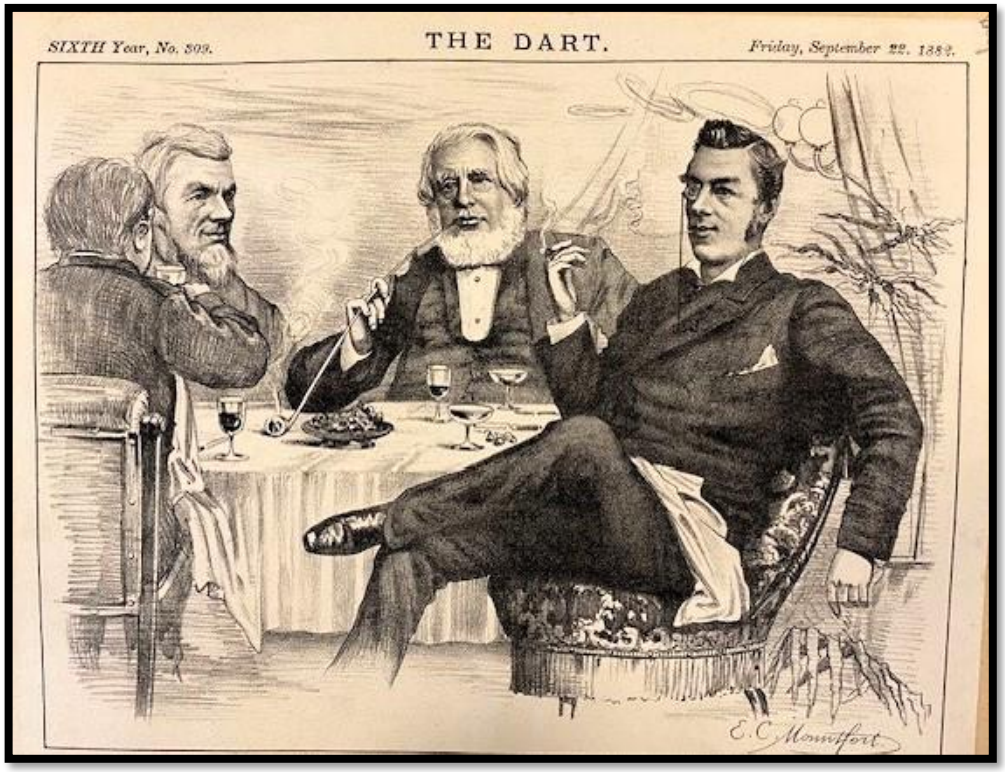


Figure 3.3: Cartoon by E. C. Mountford, 'A Cosy Supper at Highbury', *The Dart*, 22 September 1882

Reproduced with permission of the Library of Birmingham. [88]

Public health and sanitary reform were at this time the focus of national government. Benjamin Disraeli's Conservative government passed the PHA and the Artisans' Dwellings Act in 1875.[89] In the lead-up to his third proposal, the Improvement Scheme for Birmingham, Chamberlain invited representatives of other municipalities to the city to discuss the 'Sanitary Condition of Large Towns', and as host mayor, he gave the opening address on 13 January 1875 to a large audience. He talked about the new responsibilities placed upon authorities and the challenges they faced to meet them. This marks the point at which Birmingham, through Chamberlain,

[88] Joseph Chamberlain (instantly recognisable by his monocle and lack of beard) is at the forefront, with Thomas Avery sitting behind the table smoking a pipe.
[89] For details on Public Health legislations, see 'Policy Navigator', *The Health Foundation* (2023) available at https://navigator.health.org.uk/ [accessed 15 April 2023].

appeared to take the national lead for local government and its response to the new Acts. Chamberlain had an attentive audience, as other smaller authorities were also looking for answers and inspiration for what they could do with new powers, as reflected in the 100 authorities represented at this meeting. This single meeting in Birmingham, where a speech about the new national legislation was given by the city's charismatic mayor, further embedded the view that Birmingham and its local government was at the forefront of municipal policy-making for social and sanitation reform.[90]

Chamberlain had played his part in making the council supreme in its jurisdiction through the Acts of municipalisation, but his third Act for slum clearance became controversial due to the economic conditions of the time. Linda Jones examined municipal politics for this period in Birmingham and suggested that the Improvement Scheme was 'that of the confident entrepreneur: cost effective, large-scale and alluring'.[91] However, 1869-73 was the height of a boom, whereas the late 1870s and early 1880s were a time of economic depression. The rising costs evoked further ratepayer opposition that was also reflected internally from within the council, including Avery.[92] Despite this, all three Acts of Parliament during Chamberlain's mayoralty were celebrated by the civic gospel members of the BLA.[93] A permanent

[90] D. Fraser, 'Joseph Chamberlain and the Municipal Ideal', *History Today*, 37, 4 (1987); Gehrke, 'A Radical Endeavour', pp. 36-37.
[91] L. Jones, 'Public Pursuit of Private Proft', p. 250.
[92] For more about Chamberlain and the third Act during his mayoralty, the Birmingham Improvement Act 1875, see Hennock*, Fit and Proper Persons*, pp. 125-130; Marsh, *Entrepreneur in Politics*, pp. 92-102; L. Jones, Public Pursuit of Private Profit', pp. 249-253; Gehrke, 'A Radical Endeavor', pp. 35-39; Reekes*, Birmingham Political Machine*, pp. 83-88.
[93] For gas and water or municipal socialism, see Briggs, *Victorian Cities*, pp. 222-226; Hunt, *Building Jerusalem,* pp. 337-343; E. Leopold and D. A. McDonald, 'Municipal Socialism Then and Now: Some Lessons for the Global South', *Third World Quarterly*, 33, 10 (2012), pp. 1837-1853; Ward, 'Birmingham: A Political Profile', pp. 174-176.

commemoration of the Acts of municipalisation took the form of the Chamberlain Memorial Fountain (paid for by public subscription and unveiled in 1880). This was a symbol of civic pride, designed to mark Chamberlain's 'achievements in office'. Upon hearing about the scheme, Chamberlain agreed it was 'good for the party'.[94] The fountain has endured and remains a recognisable focal feature of Birmingham's city centre (Fig. 3.4).[95] The neo-Gothic design, by the architect of the civic gospel, John Henry Chamberlain,[96] is shrine-like, with images of Joseph Chamberlain and a plaque commemorating his mayoralty and public works (Fig. 3.5).[97]

For those not familiar with the city's history, the monument may suggest that it was Chamberlain alone who achieved these public works and that Birmingham was the first to take gas and water into public hands, even though there were seventy-eight municipal supplies by 1878.[98] There is no mention of George Dawson, the civic gospel or the BLA political machine.[99] Yet it was the Liberal civic gospellers themselves who chose this particular form to mark the passing of these Acts as important landmarks in Birmingham's civic history. In agreement with Briggs and Reekes, the early histories of civic achievement have 'celebrated Chamberlain at the expense of others'.[100] Chamberlain's name alone is continually linked to the

[94] Briggs, *Victorian Cities*, pp. 235-236; Roberts and Ward, *Mocking Men of Power*, p. 36.
[95] Pick, 'The Forgotten 'Civic' Career', p. 51; Briggs, *Victorian Cities*, pp. 253-256; O. R. Roberts, 'Waterworks and Commemoration: Purity, Rurality, and Civic Identity in Britain, 1880–1920, *Continuity and Change*, 2007, 22, pp. 305–325.
[96] Architect, John Henry Chamberlain (no relation to Joseph), was another key individual linked to the civic gospel and responsible for the design of many of Birmingham's Board schools, the School of Art and Joseph Chamberlain's home Highbury and the homes of other 'Liberal friends'. See A. Foster, N. Pevsner and A. Wedgwood, *The Buildings of England: Birmingham and the Black Country* (London, 2022), p. 55.
[97] Gunn, *Public Culture*, p. 51.
[98] H. Barty-King, *Water, The Book: An Illustrated History of Water Supply and Wastewater in the United Kingdom* (London, 1992), p. 138.
[99] Reekes, *Birmingham Political Machine*.
[100] Briggs (1952) cited in Reekes, *Birmingham Political Machine*, pp. 75-76.

municipalisation of the waterworks – a carefully constructed one-man (and at that time Liberal) version perpetuated in the contemporary local press, through monuments like the fountain and the subsequent council histories.



Figure 3.4: The Chamberlain Memorial Fountain

Situated in the heart of the civic centre in Chamberlain Square, opposite the entrance to the Museum and Art Gallery and the Council House. Photo: Author's own taken in 2022.

However, some contemporary criticism exists. The *Town Crier* suggested that Conservative Avery should receive some credit with the suggestion that there should be ‘an Avery Square with an Avery Memorial and the very best fountain the Water Committee could produce’. While the local magazine *Edgbastonia* commented that ‘very able men have often an unconscious way of using the labours of their

associates, taking all the credit to themselves'.[101] This study agrees with the findings of Hennock, that Chamberlain could claim the gas scheme as his own but for the water, his contribution was his oratorical skill and determination to win. Nevertheless, this was something for which Avery must have been grateful, as he subscribed £50 to the Chamberlain Memorial Fountain.[102]



Figure 3.5: The Commemorative Plaque on the Chamberlain Memorial Fountain

Photo: Author's own taken in 2022.

By the time the fountain was unveiled in 1880, Chamberlain's attention and ambition were fixed on national politics, rising to take his first cabinet post, and dividing his time between Birmingham and London. As a senior statesman and Colonial

[101] CRLSC, 942.481 TOW, 'An Epistle to his Worship the Mayor', *Town Crier*, February 1882; CRLSC, AP4.E3, *Edgbastonia, Vol III, No. 28* (Birmingham, 1883), p. 116 cited in Pick, 'The Forgotten 'Civic' Career', p. 51.
[102] *Birmingham Daily Post (BDP)*, 31 March 1880 listed subscribers to the memorial fountain; Hennock, *Fit and Proper Persons*, p. 123.

Secretary between 1895-1903, Chamberlain ceased to play a leading role in local administrative matters but continued to have a political impact on the city, continuing as MP until 1914.[103] Avery continued his civic work overseeing the municipal waterworks: he had a plan for the water supply, which he often expressed to the rest of the council:

> First improve the water supply, make it better and more pure, then increase it in quantity, then enlarge the storage resources, then build up a reserve fund for contingencies, and then give the public cheaper water.[104]

Avery had a determination to follow through on the arguments made to the parliamentary hearings, not to make a profit for the council but instead to benefit the city in improving supply and reducing the cost of water. However, this took time.[105] Avery had also set himself a personal challenge to disprove the old Economist fears of rate rises. Five years after municipalisation he boasted proudly that purchase of the waterworks 'had not cost ratepayers one single shilling', Avery ensured each year that the annuities were covered from the department's own revenue.[106] However, annual water rates were another matter entirely and Avery faced further ratepayer opposition in other ways (Chapter Five).

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[103] It was Chamberlain who effectively ended the Liberal golden age politically over Irish Home Rule, split the party and changed Birmingham's allegiance to Liberal Unionist. His relationship with Birmingham continued as MP and with the building of Highbury (the family home from 1880) until his death in 1914. Chamberlain was also instrumental in the establishment of the University of Birmingham in 1900 and became its first Chancellor.
[104] *The Birmingham Water Undertaking: Speech of the Mayor of Birmingham (Mr Alderman Avery, J.P.) at the quarterly meeting of the council held on 1 August 1882 (*Birmingham, 1882), p. 21.
[105] For Avery's full report on the work done between 1876-1883, see Bunce, *History of the Corporation II*, pp. 439-444.
[106] 'Birmingham Town Council', *BDP*, 22 February 1882. As Marsh points out, the gas and water schemes increased the debt of the city but not the rates it had to levy on ratepayers. See Marsh, *Entrepreneur in Politics*, p. 93.

Gas and Water Socialism

Derek Fraser offers an explanation why Chamberlain and Birmingham are synonymous with gas and water socialism, which this study supports. He suggests that it was significant that the gas and water acts received royal assent on the same day in August 1875. This in turn fed into the presentation of a coherent strategy – one for municipal trading, the other not for profit – which, Fraser argues, translated easily into a theoretical civic policy.[107] This permanently linked him and the city to municipal socialism, despite the 'capitalist' motivations of ensuring that the council had cheap access to essential utilities.[108] However, gaining assent simultaneously had not been intentional. Chamberlain had suggested municipalisation of the gas supply much earlier, in the first year of his mayoralty, and it would have received assent much earlier had it not been subject to delay and objections from the surrounding authorities.[109] Chamberlain raised the take-over of the waterworks in his second term as mayor in December 1874, once the implications of the forthcoming 1875 PHA were known. In the end the council took ownership of the gasworks and the waterworks simultaneously on 1 January 1876.[110]

The narrative of municipal socialism served Chamberlain well for his relationship with the people of Birmingham and was an image he deliberately 'cultivated'.[111] However, the major flaw for the Liberals was that, by choosing to focus their strategies and

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[107] D. Fraser, 'Joseph Chamberlain and the Municipal Ideal', *History Today*, 37, 4 (1987). Despite the resolution for the gasworks being passed earlier in the council than that for the waterworks, a delay at the parliamentary hearing stage meant that they were passed on the same day in 1875. This was also the reason why it could never be claimed that the gas profits paid for the waterworks – the gas had not actually made any profits at that point.
[108] Hunt*, Building Jerusalem*, p. 342.
[109] Bunce, *History of the Corporation II,* pp. 353-365.
[110] Bunce, *History of the Corporation II*, pp. 353-365 and 406-414.
[111] Ward, 'Birmingham: A Political Profile', p. 175.

achievements through one single individual, the story followed the individual long after he had severed ties with the Liberals. Just six years after the fountain was unveiled, Chamberlain brought an end to the Liberals' golden age in Birmingham and instead created 'Chamberlain's Duchy' of Liberal Unionism.[112] Even though historians have highlighted the alternative perspective, the Liberal narrative continues to have an enduring legacy in twenty-first-century Birmingham.[113]

Shifting Council Priorities

Hassan suggests that, in contrast to Birmingham's situation, firefighting had been the main incentive in some towns for taking over waterworks.[114] This appeared to be the case in Manchester due to the nature of the city's trade that involved innumerable warehouses.[115] Similarly, there were disputes with the private water companies in Liverpool as 'between 1838 and 1846 there had been 990 fires, resulting in a loss of property valued at £2,567,291'.[116] For Birmingham, the issue of water supply for firefighting was not used as an argument for compulsory purchase: instead this was firmly based on public health, with particular reference to the number of polluted wells in the city.[117] However, water supply for firefighting was propelled to the top of council

[112] Reekes, *Birmingham Political Machine*, pp. 1, 119-45.
[113] 'Joseph Chamberlain's Time in Birmingham', *Chamberlain Highbury Trust* (2021) https://chamberlainhighburytrust.co.uk/2021/04/28/joseph-chamberlains-time-in-birmingham/ [accessed 8 January 2024]
[114] Hassan, 'The Growth and Impact of the British Water Industry', p. 543.
[115] A. Wilson, 'Technology and Municipal Decision Making: Sanitary System in Manchester 1868-1910' (Unpublished PhD Thesis, University of Manchester, 1990), p. 68.
[116] S. Sheard, 'Nineteenth Century Public Health: A Study of Liverpool, Belfast and Glasgow' (Unpublished PhD Thesis, University of Liverpool, 1993), p. 112.
[117] *A Short History of the Passing of the Birmingham Corporation Gas Act and Water Acts 187*5; Bunce, *History of the Corporation, II*, pp. 407-411.

business after two serious fires in 1878 and 1879, although these did not involve large commercial concerns.

The ‘Digbeth Fire’ occurred on 26 August 1878 when four people were killed. Local newspapers recounted harrowing details of a mother with her baby overcome by smoke and falling from a window to the pavement in front of spectators.[118] Understandably, this distressing event brought firefighting and the need for adequate water supply to the forefront of public debate as the waterworks had been taken into municipal ownership two years earlier. The following year, on 11 September 1879, there was another serious fire, this time at the Central (or Free) Library, in Radcliffe Place (Fig. 3.6). The fire had started after a workman tried to defrost a frozen gas pipe and accidentally set light to wood shavings close by. Mercifully, no-one was killed but the building was destroyed and over 50,000 books and manuscripts in the Reference Library were lost.[119] To contemporaries within the council, this library was one of the earliest physical symbols of the civic gospel, an embodiment of the developing culture and civic pride. The devastation struck at the heart of the municipal ideal. Dawson, an advocate of the Free Libraries movement, had delighted in giving the keynote address at the opening of the library in 1866.[120]

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[118] ‘Terrible Fire in Birmingham’, *Evening Post*, 2 November 1878, Supplement; Bunce, *History of the Corporation II,* pp. 418-419.

[119] Bunce*, History of the Corporation II,* pp. 419-420; C. Upton, ‘Precious manuscript lost in library blaze’ (2013), *Business Live* (2021) https://www.birminghampost.co.uk/lifestyle/nostalgia/precious-manuscript-lost-blaze-birminghams-6455020 [accessed 25 January 2021].

[120] For Dawson’s speech at the opening of the library, see Reekes, *Speeches that Changed Britain*, pp. 56-57. The development of the municipal library service, including Dawon's role, is the subject of current PhD research by Stephen Hewett in the School of History and Cultures at the University of Birmingham: https://www.birmingham.ac.uk/schools/historycultures/departments/history/research/postgraduateresearch/profiles/hewett-steve.aspx [accessed 8 January 2024].

The council's Free Libraries Committee met soon after the fire and mobilised quickly to 'repair the loss' to the city.[121] They established a voluntary subscription fund to which many members of the committee donated and, in combination with insurance funds, a new library was built and opened on 1 June 1882.[122] The *History of the Corporation* (*Vol. II*) gave attention to both fires and summarised the Local Government Board enquiry's conclusion that, despite complaints, there had been an adequate water supply to extinguish the flames.[123] However, the council minutes and newspaper reports reveal that after the library fire, councillors were focused on firefighting in council properties and fire insurance arrangements.[124] Later in 1879 a resolution was passed to replace all wooden fire plugs with new hydrants as an urgent priority. This left Avery and the Water Department with no choice but to comply and divert labour and resources to the task.[125] Records do not suggest that an extra workforce was brought in to deal with this matter separately, which suggests that the extension of supply to houses and courtyards was delayed by dealing with this priority matter.[126]

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[121] Bunce, *History of the Corporation II,* p. 228.
[122] Bunce, *History of the Corporation II,* p. 231.
[123] Bunce, *History of the Corporation II*, pp. 224-234 and 418-20.
[124] *BDP*, 15 February 1879; BAC, Severn Trent Collection, MS 944/5, Water Committee Minute Book 28 June 1878-22 October 1880. The minutes reveal the pre-occupation with water supply for firefighting and discussions about looking at all other buildings in the town such as theatres; Bunce*, History of the Corporation II*, p. 420.
[125] Newspaper reports reveal the prioritisation of this task with regular updates on the number completed so far, *e.g. Dailly Gazette*, 2 February 1880.
[126] Council records suggest that fire plugs were not an early concern as only 56 were replaced in 1876. After the library fire a total of 1,197 were replaced in 1879 and a further 2,500 new hydrants in 1880-1; see BAC, MS 944/8, Water Committee Minute Book Nov 1885- Jan 1889, 'Report of the Water Committee for the Council Feb 1888'.



Figure 3.6: The Burnt Remains of the Central (Free) Library in Radcliffe Place, Birmingham

Reproduced with permission of the Library of Birmingham. Ref: WK/B11/8531.

Simultaneously, the Health Committee pursued its own priorities as Medical Officer of Health (MOH), Dr Alfred Hill, finally had the power to close polluted wells under the 1875 PHA. The council as the Urban Sanitary Authority had to ensure that there was a water supply, which meant that landlords were compelled to connect to the piped supply. Council records reveal the friction between the Health and Water Committees due to delays installing new supplies at properties where polluted wells had been closed, resulting in representatives from both committees having to meet to resolve the problem. The Water Committee and Avery were under immense pressure, juggling resources to satisfy the wishes of the full council on firefighting, to expand supply, and to meet Sanitary Authority commitments and make the annuities

payments due each year out of the department's revenue. That said, between 1876 and 1887, 62,000 new supplies were recorded, although this figure includes reconnections. However, without the diversion of resources between 1879 and 1881 to meet the new priority of firefighting, that figure could have been much higher.[127]

The ability to fight fires was necessary but would the Digbeth fire alone have motivated such a swift resolution and diversion of resources to tackle supply for firefighting once and for all? Alan Wilson suggests that the business interests of the Manchester civic elite were the key motivation 'to take action', with over 4,000 hydrants installed in business districts within two years of waterworks ownership.[128] So soon after the tragic Digbeth fire, the attitude of the Free Libraries Committee and the council over the destruction of their beloved library was that 'the most lamentable disaster has befallen the town' and that 'every citizen felt he had sustained a loss'.[129] However, this was the perspective of the Liberal council. It could be argued that the shifting priorities were motivated by the realisation that the physical embodiment of the civic gospel and evidence of its contribution to Birmingham vested in the new civic and public buildings could be at risk. Conversely, it is conceivable that citizens living in back-to-back houses with their polluted wells or non-existent water supply might have disagreed with the priority decisions of the council.

[127] BAC, MS 944/8, 'Report of Water Committee for the Council Feb 1888'.
[128] Wilson, 'Technology and Municipal Decision-Making', pp. 68, 364.
[129] Bunce, *History of the Corporation II,* pp. 228-229.

Conclusions

This chapter has revisited Birmingham's earlier political structures and boundaries to show what came before the 1911 Greater Birmingham Act and the multitude of different authorities that surrounded Birmingham in the mid-nineteenth century. Chapters Four and Five will continue to explore how these authorities interacted in respect to sanitation and environmental pollution issues. This chapter has also reconsidered the composition of Birmingham's council and the influences of the civic gospel on local politics to explore the validity of the concept of a 'Liberal golden age'.[130] From 1873 the Liberals were in complete control of all administrations and advanced the building of a host of new schools and cultural amenities, many of which continue to exist. Therefore, it is valid to some extent to describe the 1870s and 1880s as a golden age, when seen from the perspective of the nonconformist elite civic gospellers and members of the BLA. This period was, and remains, memorialised through its late-Victorian buildings and monuments in the main civic area of the city. Nevertheless, this period did witness an extension of the administrative remit of the city and municipal trading placed the council on a sounder financial footing, although its debt increased significantly.

In agreement with Hennock and Jones, this thesis contends that the composition of the council was significant, with businessmen adopting business principles for municipal affairs, particularly in terms of municipalisation of gas and water supplies. The co-operation and common ground between Avery and Chamberlain demonstrated that some issues transcended municipal party politics. It is this aspect

[130] Ward, 'Birmingham: A Political Profile', pp. 171-174.

that Ralph so admired when he accorded Birmingham the 'best city' accolade. While addition of the words 'in the world' was obviously an exaggeration, it nevertheless suggests that Ralph considered Birmingham's rejuvenated system of governance to be the template for all local authority administration.[131] Ralph's statement fed into that 'already mythicised past associated with the highpoint of Liberalism and civic progress in the 1870s and 1880s'.[132] To its own detriment, however, that past – as promoted by the BLA and the political machine – was centred on Chamberlain and it followed him even after the party split, with every retelling cutting out the BLA and other individuals (like Avery) from the story. Gunn highlights how this account has been perpetuated, with Chamberlain's 1914 funeral on such a scale as had never before been witnessed in a provincial city. The press at that time looked back to this golden age, with Chamberlain as its leading light, regardless of the party split.[133] It is this narrative that remains embedded in the city's memory, which Ward describes as 'the cult of Chamberlain'.[134]

Added into this narrative was Chamberlain's, and therefore Birmingham's, association with sanitation. Public health was at the heart of national debate in the 1870s as central government passed key legislation. This fortuitously coincided with Chamberlain's mayoralty and the municipalisation of Birmingham's gas and water supplies. The arguments for municipalisation of the water supply on the grounds of public health had been presented earlier by Hill and Avery, but Chamberlain was reiterating them at precisely the right time. This assisted the civic gospellers, and the

[131] Ralph, 'Best-Governed City'.
[132] Gunn, *Public Culture*, p. 181.
[133] *Ibid.*
[134] Ward, 'Birmingham: A Political Profile', p. 174.

BLA working in the background, to position Chamberlain not only as the party's figurehead, but also as a leading figure in municipal sanitation reform. Chamberlain's rising prominence on the national stage brought the spotlight onto him and the city when the 1875 PHA was passed, culminating in the trinity of municipal socialism, Chamberlain and Birmingham. However, as this thesis demonstrates, municipalisation of gas and water supplies was merely the start of a long sanitation journey, as the council faced years of additional challenges over water supply, waste management and domestic sanitation. It is perhaps ironic that the other civic gospel-inspired individuals, many of whom remained loyal to Gladstone's Liberal Party after the split, would be the ones who implemented sanitation reforms in Birmingham, working for years after Chamberlain's mayoralty (see Appendix 1: Index of Persons).

The evidence presented for the council's changing priorities in the diversion of resources to ensuring water supply for fighting fires demonstrates that it was not a golden age for all citizens. It is of course difficult to know how the poorest citizens of the city felt about the new amenities of schools, libraries and a museum and art gallery and whether they lamented the loss of the Central Library, as the council suggested. It might be reasonably assumed that they were far more concerned with the immediate problems they faced: inequalities over water supply and poor sanitation in the thousands of back-to-back houses. The next chapter explores the first major sanitation challenge for the council - Birmingham's sewage crisis.

Chapter Four

Trouble on the Tame: Birmingham's Sewage Crisis 1871-1920s

One of the best-known images representing river pollution at the time of the Great Stink on the Thames is the cartoon *The Silent Highway*, depicting 'Death' in a rowing boat surrounded by the carcasses of dead animals floating in the river.[1] The subsequent building of London's brick sewer system, overseen by Joseph Bazalgette, is the civil engineering project most synonymous with the sanitary revolution in Britain.[2] Looking at the situation in Birmingham, this chapter focuses on river pollution and sewage works, not the actual building of sewers, in the city. Sewerage developments are well documented in a centenary history of Birmingham's Public Works Committee (PWC), despite the Whiggish presentation of that history.[3] This chapter offers further insight into the development of the water industry in England and Wales through examination of a joint drainage board and explores themes of sustainability and recycling. John Sheail's study, looking at Victorian town wastes and agricultural sustainability, identified a four-stage model (discussed later) but did not offer specific case studies.[4] As such, exploring municipal responses to Birmingham's sewage crisis offers the opportunity, as a research question, to look for

[1] The cartoon was published in *Punch* on 10 July 1858. To see the cartoon see the Blog in the next footnote.
[2] A. Collinson, 'How Bazalgette built London's First Super-Sewer', *Museum of London* [Blog] 26 March 2019 https://www.museumoflondon.org.uk/discover/how-bazalgette-built-londons-first-super-sewer [accessed 16 May 2023]; S. Halliday, 'The Water-Closet: 'No Filth in the Sewers, all in the River'', *The Great Stink of London: Sir Joseph Bazalgette and the Cleansing of the Victorian Metropolis* (Stroud, 2009), pp. 35-57.
[3] See J. L. MacMorran, *Municipal Public Works and Planning in Birmingham, 1852-1972* (Birmingham, 1973).
[4] J. Sheail, 'Town Wastes, Agricultural Sustainability and Victorian Sewage', *Urban History*, 23, 2 (1996), pp. 189-210.

evidence to support or contradict Sheail's sustainability model, using Birmingham as a case study.

In separate studies Bill Luckin and Leslie Rosenthal emphasise the 'environmental dilemmas' of the nineteenth century. Luckin explores broadly the relationships between pollution and environmental change in cities, covering aspects such as the treatment and disposal of waste, river contamination, refuse systems and atmospheric pollution. Luckin is particularly interested in asking: at what point in different localities did an environmental dilemma become 'unendurable'?[5] Rosenthal concentrates on river pollution and frames the dilemma within legal cases involving town authorities and the civil courts. Throughout the Victorian period there was no fully effective means of sewage treatment and bringing sanitation to towns involved the 'despoiling of the countryside'. The dilemma for the courts was either to stop polluting sewage works and nuisance practices or to tolerate immense social problems and public health catastrophes.[6]

Anthony Wohl emphasises that rivers endured multiple pollutants from the urban environment: in addition to dead bodies of animals there were industrial effluents, bricks, street sweepings, excrement, ashes and slaughterhouse contents. The situation was compounded at outfalls by sewer networks and the expanding water-carriage systems delivering untreated sewage and urban waste directly into the rivers. Wohl concluded that the prevention of river pollution must be seen as one of the 'least satisfactory chapters in the history of Victorian public health'.[7] This was the

[5] B. Luckin, 'Pollution in the City' in *Death and Survival in Urban Britain: Disease, Pollution and Environment, 1800-1950* (London, 2015), pp. 93-117 and p. 93.
[6] L. Rosenthal, *The River Pollution Dilemma in Victorian England: Nuisance Law Versus Economic Efficiency* (Oxon, 2014), pp. 1-2.
[7] A. S. Wohl, *Endangered Lives: Public Health in Victorian Brita*in (London, 1983), p. 256.

situation at Birmingham's outfall situated at Saltley, close to where the waters of the River Tame and the River Rea merged. From the early 1850s, two newly-built mains discharged untreated effluent directly into the River Tame which flowed past landowner Charles Adderley's Hams Hall estate.[8] Rosenthal's *The River Pollution Dilemma in Victorian England* (2014) examines ten legal disputes, including that between Adderley and the council (Attorney-General v Council of Borough of Birmingham, 1858-1895). This was a protracted law case concerning river pollution, considered to be the first to cite sewage nuisance (referred to in Chapter Two).[9] This chapter builds on the work of Rosenthal by exploring the impact of this case on Birmingham council's policy-making and sets out to establish to what extent it may have hindered Birmingham's sanitation revolution and the transition to full water carriage.

Rosenthal offers an overview of the legal circumstances of the case and refers to the creation of the Birmingham Tame and Rea District Drainage Board (BTRDDB), which was dominated by those connected with Birmingham council.[10] The present study looks more closely at the BTRDDB by examining its records, as well as engineering papers and publications produced by BTRDDB engineers and clerks.[11] The sources offer insight into the development of a large-scale waste utility and assess how it

[8] Wohl, '"Reservoirs of Poison": River Pollution' in *Endangered Lives,* pp. 233-256; 'Hams Hall', *Tame Valley Wetlands* http://www.tamevalleywetlands.co.uk/hams-hall2/ [accessed 16 May 2023].
[9] Nuisance covers disputes where the actions of the defendant cause a substantial interference with the claimant's land or the use and enjoyment thereof. For a detailed discussion of Birmingham's dispute with Charles Adderley (Attorney-General v Council of the Borough of Birmingham, 1858) and the Gravelly Hill Realtors, see L. Rosenthal, 'Economic Efficiency, Nusiance and Sewage: New Lessons from Attorney- General v. Council of the Borough of Birmingham, 1858-95', *Journal of Legal Studies*, 36 (2007), pp. 27-62. Also, Chapter 5, 'Birmingham, Adderley and the River Tame' in L. Rosenthal, *The River Pollution Dilemma in Victorian England: Nuisance Law Versus Economic Efficiency* (Oxon, 2014), pp. 57-90.
[10] See Thomas Avery, William Harris and George Baker in Appendix 1: Index of Persons.
[11] Birmingham Archives and Collections, Library of Birmingham (BAC), Severn Trent Collection, MS 946. The papers and publications of engineers and clerks are referenced separately throughout.

attempted to tackle Birmingham's 'sewage question'.[12] Additionally, it offers insight into the development of sewage treatment methods and infrastructure with the rediscovery of the pioneering work of John Duncan Watson, chief engineer to BTRDDB after 1899.[13] This supplements other research uncovering the important contribution of sanitary engineers working in specific localities, looking beyond the star names who offered consultation services at multiple locations around the country.[14]

The chapter begins with Birmingham's sewage crisis 1870-72 and subsequent council Sewage Inquiry. It then examines the administration of Birmingham's sewage, initially by the council and then through the separate entity of the BTRDDB. Using Birmingham as a case study, it examines how the sewage question was tackled, by exploring disposal methods for both 'wet' and 'dry' systems. It discusses Victorian schemes of utilisation and recycling and looks for evidence for Sheail's four-stage model for concepts of sustainability in terms of agricultural land use.[15] Finally,

[12] J. A. Hassan, 'The Growth and Impact of the British Water Industry in the Nineteenth Century', *The Economic History Review*, 33, 4 (1985), pp. 531-547; J. A. Hassan, 'The Water Industry 1900–51: A Failure of Public Policy?', in R. Millward and J. Singleton (eds), *The Political Economy of Nationalisation in Britain 1920-1950* (Cambridge, 1995), pp. 189-211. For more on the 'sewage question' see T. Crook, *Governing Systems: Modernity and the Making of Public Health in England, 1830-1910* (California, 2016), pp. 169-176 and for waste management, see pp. 289, 291-292.

[13] Note: before Watson, Birmingham's Borough Surveyor, William Spooner Till, became the first engineer to the Birmingham Tame and Rea District Drainage Board (BTRDDB). For more on Till and Watson, see Appendix 1: Index of Persons. Also, an obituary for John Duncan Watson (1860-1946), *Journal of the Institution of Civil Engineers*, 27 (4) (1947), pp. 497-498. For details of Watson's work, see J. D. Watson, *The Works of the Birmingham Tame & Rea District Drainage Board* (Birmingham, 1912), with information about the board's districts, land, sewage treatment and statistical information on flow rates and analyses of Birmingham's crude sewage.

[14] For a local example, see, S. Jordan, 'Edward Bindon Marten: Sanitation Engineering and Industrial Safety in the Black Country', *Midland History,* 47, 2 (2022), pp. 150-168.

[15] Dry conservancy systems included earth, ash, pail and pan closets. Wet systems (water carriage) included the variety of water closet technology as it developed. For a good overview, see Sheail, 'Town Wastes'; D. J. Eveleigh, *Privies and Water Closets* (Oxford, 2008), pp. 15-25; Crook, in *Governing Systems*, pp. 176-188.

parallels are drawn between nineteenth-century and modern-day waste treatment practices and sustainability.[16]

The Sewage Crisis 1870-72

All Victorian towns and cities faced 'the sewage question': What should be done with sewage once it reached an outfall? Tom Crook highlights that by the 1860s it was a national issue that motivated numerous official investigations.[17] Birmingham's early attempts to deal with this question resulted in litigation and this section considers this local situation and its impact on municipal policy and responses to sanitation.

The complaint made by Charles Adderley (later Lord Norton) in 1858 marked the start of a protracted legal dispute that was not completely resolved until 1895. The action forced the council to address the discharging of raw sewage directly into the River Tame. There had been earlier attempts at a solution, with settling tanks and sludge spreading, but these proved inadequate for the volume of waste delivered to the outfall, and so the condition of the Tame simply worsened. The situation reached a crisis point in 1870-1 because in addition to the ongoing Adderley case, another was brought by a group known as the Gravelly Hill Realtors.[18] Their complaint was not about river pollution, but about the drying of the sludge on land at Saltley, which was a response to the problem of river pollution. The sludge was often left for months in heaps and lagoons, causing yet another great stink, this time on land, close to the

[16] N. Goddard, 'Nineteenth-Century Recycling', *History Today,* 31, 6 (1981), pp. 82-87; T. Cooper, 'Rags, Bones and Recycling Bins', *History Today,* 56, 2 (2006); H. Irving, 'The War on Waste: Using Urban History to Inspire Behavioural Change', *Urban History*, 48 (2021), pp. 307-319.
[17] Crook, *Governing Systems*, p. 169.
[18] Gravelly Hill is a district in Birmingham and at that time was close to the operations at Saltley Outfall Works. Rosenthal, *River Pollution Dilemma*, p. 69.

Realtors' substantial villas. The stink was considered 'injurious' to health as the prevalent miasmatic theory linked bad smells with disease.[19] In March 1871, both the Relators and Adderley had their restraining orders upheld by the Court of Chancery, meaning that the council could not discharge sewage into the Tame or spread sludge on the land. This was the crisis: for the town and its citizens as the entire waste management system had been ordered to cease; but also for the council, as the consequences for non-compliance were the sequestration of its assets. Surprisingly, despite finding in the claimants' favour, the Court of Chancery then suspended the restraining orders until November 1871.[20] In Rosenthal's opinion, the court was aware of the dilemma towns faced in dealing with sewage but had to honour the lawful rights of land and property owners. Essentially, the court granted a suspension to give the council time to do something to resolve the situation.[21]

The council was in trouble, but what followed was a spell of internal conflict in the council chamber as the PWC, which had hastily commissioned an enquiry into future treatment methods, suggested a scheme estimated to cost £275,000. Thomas Avery and other new civic gospel councillors (including Joseph Chamberlain) argued that rushing into such an expensive scheme would not solve the immediate problems of the Chancery restraining orders.[22] The council in-fighting continued throughout June and July 1871 but eventually saw the establishment of the Sewage Inquiry Committee; under the direction of Avery, this battle was won in contrast to the 1869

[19] Rosenthal, *River Pollution Dilemma*, pp. 66-68; L. Ferriday and J. Watts. '"It was just smog": Bristol Gasworks, Industrial Pollution and Memory, 1821-1970', [Blog] 24 March 2023, *MedEnv Network* https://medenvnetwork.wordpress.com/2023/03/24/it-was-just-smog/ [accessed 25 March 2023].
[20] Rosenthal, *River Pollution Dilemma*, p. 71
[21] *Ibid.*, pp. 71, 90.
[22] *Ibid.*, p. 73.

attempt to municipalise the waterworks. The Inquiry was to establish and recommend the best course of action to address the immediate problems facing the council.

What was produced from the Inquiry investigations and recommendations was an impressive 300-page *Sewage Inquiry Report* (1871*),* detailing practices in other towns and cities; the latest sewage treatment techniques; and surveys and medical practitioner questionnaires.[23] A comprehensive survey of the sewered streets draining into the River Tame at Saltley listed the number of domestic properties and other buildings where specific types of activities took place, such as slaughterhouses or manufactories (see Fig. 4.1). The committee also consulted with the town's medical professionals and other eminent engineers and chemists, including Thomas Hawksley, John Bailey Denton and William Hope – the latter being regarded as an expert on sewage irrigation with his model farm at Romford.[24] A significant part of the report was dedicated to sewage treatment, detailing the various chemical, filtration and irrigation methods. Committee deputations had concentrated on northern towns, visiting Liverpool, Bolton, Manchester, Nottingham and Rochdale to enquire about their sanitary arrangements.[25] This document is a rich source that offers insights into the conservancy systems and sewage treatments in use in England in the 1870s. It

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[23] BAC, L45.4.2107, *Report of the Sewage Inquiry Committee* (Birmingham, 1871). Note: Hereafter *Sewage Inquiry Report.*

[24] Thomas Hawksley (1807-1893), Full biographical entry by T. H. Beare, 'Hawksley, Thomas (1807 – 1893)', *Oxford Dictionary of National Biography* (*ODNB),* http://doi.org/10.1093/ref:odnb/12691 [accessed 17.6.20]**;** also see Learning Resources at Manuscripts and Collections, 'Thomas Hawksley', *Nottingham University* (n.d.) available at https://www.nottingham.ac.uk/manuscriptsandspecialcollections/learning/healthhousing/theme2/hawksley.aspx [accessed 30 April 2023]. For John Bailey Benton (an engineer involved in water supply and disposal of sewage schemes), see obituary from the Institute of Chartered Engineers, available at https://www.icevirtuallibrary.com/doi/pdf/10.1680/imotp.1894.20121 [accessed 30 April 2023]. For William Hope, see Goddard, 'Nineteenth-Century Recycling'.

[25] *Sewage Inquiry Report*, pp. 19-40 offers overviews of the systems in place at Liverpool, Bolton, Manchester, Rochdale, Leeds, Nottingham and Hull, with recommendations on pp. 41-42. Diagrams of closet systems in Manchester and Rochdale were included as appendices. Sewage treatments are discussed on pp. 43-93.

was a significant document at the time of publication and was sought out for consultation by other governing authorities including those in Europe. German Commissioner, Herr Lefeldt, who was tasked with reporting on the sewage question in Britain, understood that the Birmingham investigations were 'the most thoroughly conducted, perhaps, ever made' when he requested a copy in December 1872. John Thackray Bunce in the council histories suggests that the report was regarded as an authority on sewage treatment until the mid-1880s.[26]

Totals from sewered streets sewered and draining into the River Tame at Saltley

Total number of houses	72087
Manufactories/Workshops	6835
Public buildings	282
Stables	154
Cowhouses	2
Slaughter houses	292
No. of communications with sewers	12970
No. of WCs in streets	7005
No. of ashpits draining into sewers	13534
No. of ashpits undrained	5169
No. of ashpits covered	4233

Figure 4.1: Collated Statistics from Borough Surveyor Survey for the Sewage Inquiry 1871.[27]

With the suspension deadline approaching, the council accepted the Inquiry Committee's multi-faceted recommendations to deal with the city's sewage and address the injunctions (see Appendix 4). This involved the operation of two separate

[26] BAC, Birmingham City Council Collection, BCC/1/AW/1/1/1, Sewage Committee Book, Report of Sewage Committee 7 January 1873; J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885), p. 131, previously cited in J. Pick, 'The Forgotten 'Civic' Career of Thomas Avery' (Unpublished MA Dissertation, University of Birmingham, 2017).

[27] *Sewage Inquiry Report*, p. 127. The Borough Surveyor reported that there were 183 miles of streets in the borough (1000 acres) with 130 miles of sewers from 1845 (plus several miles of old sewers).

systems (dry and wet) to reduce the volume of waste entering the sewers and the River Tame, and of enhanced schemes to treat and dispose of the sewage that arrived at the outfall.[28] The council could not prohibit citizens installing water closets in their homes, but it did adopt a policy of discouragement by charging to join the council's sewer network. Administratively, a new Sewage Committee was established, with Avery as chairman,[29] effectively taking control away from the PWC for the outfall and sewage treatment.[30] Avery had taken the lead here and assumed ownership of this problem on behalf of the council. However, the intended strategy encountered problems because in 1872 there was a further legal dispute with the failure of the Birmingham Sewerage Bill to become law. The delays meant that any actual work did not start until late in 1872.[31]

There was one further administrative recommendation in the 1871 Report: the suggestion of a joint 'drainage commission'. The idea was to involve all the districts which drained into the River Tame, as the surrounding districts outside Birmingham also contributed to sewage pollution. Whatever measures Birmingham council put in place to address the problem, it had no control over what was discharged into the Tame by other authorities. The Sewage Inquiry Committee quickly realised that this had the potential to impact their dispute with Adderley. Yet, as the committee acknowledged, there was no legislation that allowed them to address the issue at that time.[32] The opportunity finally arrived with the Public Health Act 1875 and, after

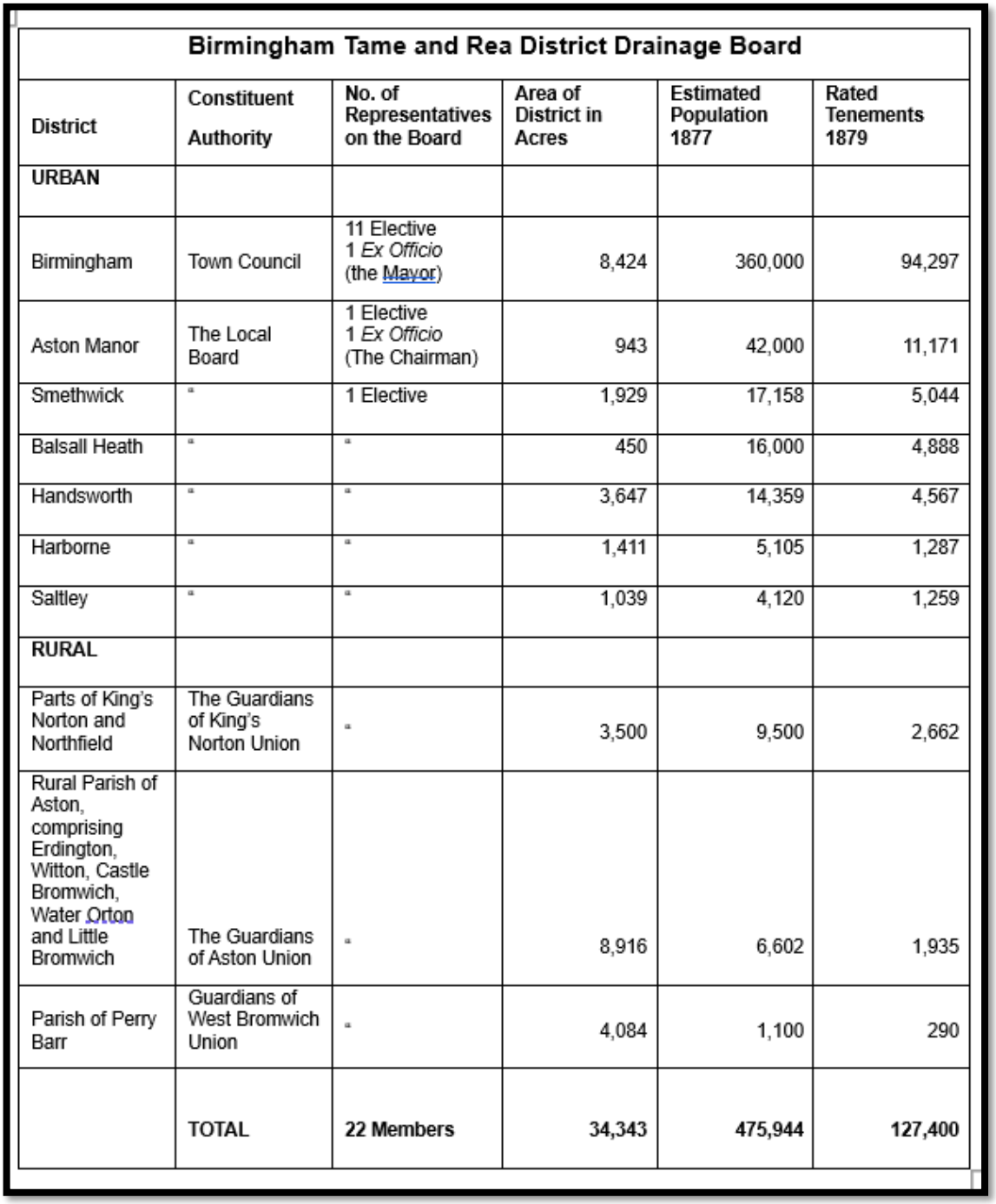
[28] See footnote 15.
[29] The newly formed Sewage Committee was formed with members from the Inquiry: Thomas Avery (Chairman), Henry Hawkes, Dr Alfred Barratt, Jesse Collings, William Harris, John Lowe, Edmund Tonks.
[30] The construction of sewerage remained with the Public Works Committee.
[31] Rosenthal details the 1872 legal and parliamentary crisis in *River Pollution Dilemma*, pp. 75-83.
[32] *Sewage Inquiry Report*, p. 98.

negotiations with other local authorities, a new joint board was established in 1877. The next section analyses the nature and impact of one of England's early drainage boards.[33]

Birmingham Tame and Rea District Drainage Board (BTRDDB)

Anthony Wohl refers to the first drainage boards with the Thames and Lee Conservancy Boards established in 1857 and 1864 respectively. However, he suggests that the next joint board was not established until 1891 and therefore must have been unaware of BTRDDB.[34] John Hassan suggests that 'the foundations of the modern water industry were laid in the nineteenth century', developing into a 'fragmented structure', with water supply and drainage boards as separate entities. By 1927 there were 361 drainage authorities, 'controlling 2.9 million acres in England and Wales'.[35] The examination of BTRDDB offers insight into these fragmented beginnings and the motivations for different local authorities to join in with this scheme.

[33] N. Harkness, 'The River Tame – A Short History of Water Pollution and Control within an Industrial River Basin', *Water Science Technology*, 14 (1982), pp. 153-165, p. 155.
[34] Wohl, *Endangered Lives*, pp. 233-256.
[35] Hassan, 'Water Industry 1900–51', pp. 191-193.



Birmingham Tame and Rea District Drainage Board					
District	**Constituent Authority**	**No. of Representatives on the Board**	**Area of District in Acres**	**Estimated Population 1877**	**Rated Tenements 1879**
URBAN					
Birmingham	Town Council	11 Elective 1 *Ex Officio* (the Mayor)	8,424	360,000	94,297
Aston Manor	The Local Board	1 Elective 1 *Ex Officio* (The Chairman)	943	42,000	11,171
Smethwick	"	1 Elective	1,929	17,158	5,044
Balsall Heath	"	"	450	16,000	4,888
Handsworth	"	"	3,647	14,359	4,567
Harborne	"	"	1,411	5,105	1,287
Saltley	"	"	1,039	4,120	1,259
RURAL					
Parts of King's Norton and Northfield	The Guardians of King's Norton Union	"	3,500	9,500	2,662
Rural Parish of Aston, comprising Erdington, Witton, Castle Bromwich, Water Orton and Little Bromwich	The Guardians of Aston Union	"	8,916	6,602	1,935
Parish of Perry Barr	Guardians of West Bromwich Union	"	4,084	1,100	290
	TOTAL	**22 Members**	**34,343**	**475,944**	**127,400**

Figure 4.2: The Urban and Rural Sanitary Authorities Members of the Birmingham Tame and Rea District Drainage Board

Transcribed by the author, information taken from A. E. Harris, *History of The Birmingham Tame and Rea District Drainage Board* (Birmingham, 1927), p. 8. BAC, L45.41 340414.

The BTRDDB took over the mandate of the council's Sewage Committee and for legal and financial purposes it was established as a separate organisation with its own administration and finance. At the time there were administrative and financial incentives for this fragmentation as local authorities were given opportunities to access loans through the Local Government Board for large-scale improvements, thus limiting risk to authorities.[36] The Adderley case was also a motivating factor. The BTRDDB had to purchase all the existing sewage works and lands held by the ten member authorities (Fig. 4.2).[37] The area covered by BTRDDB in 1877 was fifty-four square miles for a population of half a million.[38] By 1881 the district expanded to include Sutton Coldfield and Figure 4.3 shows the main drainage district in 1903. After the boundary changes of the Greater Birmingham Act in 1911, most of the original member authorities were absorbed into Greater Birmingham with the gross area of almost 69,000 acres serving a population of over 947,000.[39]

As the number of representatives demonstrated, Birmingham dominated proceedings, because the city was the largest in terms of acreage, population and houses, and it paid the highest contribution to the 'common fund' calculated in proportion to the number of rated tenements.[40] The creation of the BTRDDB was instigated by Birmingham's council, motivated by the lack of control it had over what went into the River Tame and conscious of the continued sewage pollution dispute

[36] Hassan, 'Water Industry 1900-51', p. 193.
[37] BAC, MS944/345, BTRDDB Minute Book, Printed pages from Standing Orders inserted into book. For full details of lands and costs, see Bunce, *History of the Corporation II,* pp. 158-167.
[38] F. C. Vokes, 'The Future Sewage-Disposal Works of the Birmingham Tame and Rea District Drainage Board - a Forecast', *Journal of The Royal Sanitary Institute,* 68, 2 (1948), pp. 69-82, p. 69.
[39] Watson, *The Works*, pp. 2-3. By 1948 the area had increased to 163 square miles with a population of 1.25 million; see Vokes, p. 69.
[40] Bunce, *History of the Corporation II,* p. 155. Birmingham had 11 representatives plus the mayor as ex-officio.

with Adderley.[41] Members of Birmingham's Sewage Committee took leading roles in the BTRDDB, with Avery as Chairman supported by committee colleague, William Harris, who took the role of clerk.[42] Significantly, at this point Avery was already chair of the council's new Water Committee (Chapter Five), so there was an even greater incentive to tackle river pollution, as the River Tame was one of the sources of supply for the municipal waterworks.

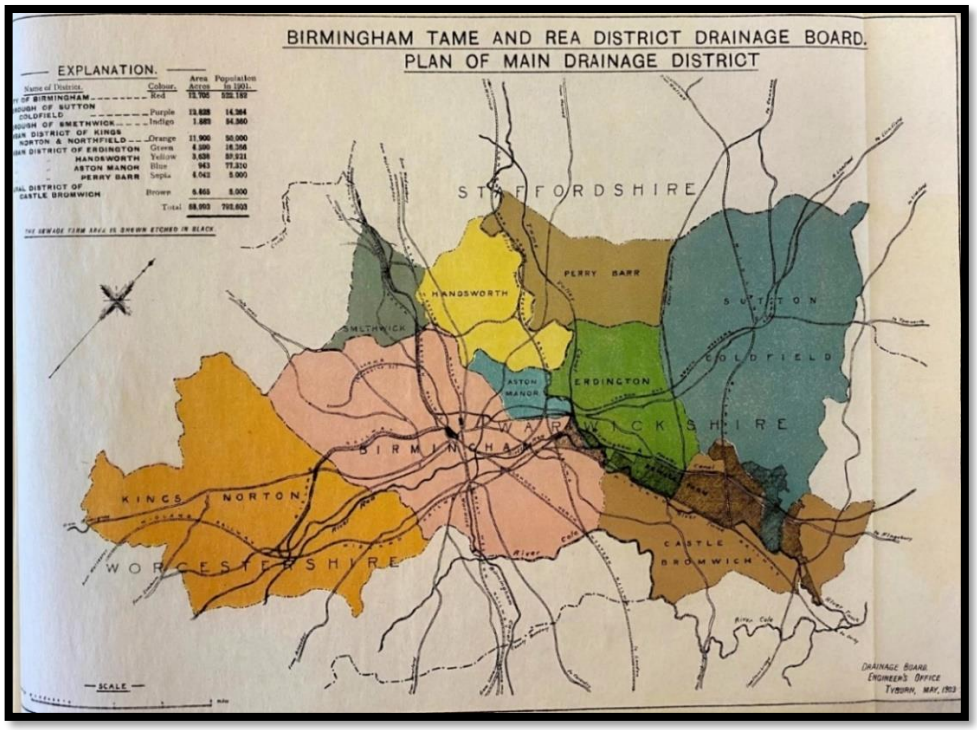


Figure 4.3: Plan of the Main Drainage District in 1903.

The black shaded area shows the sewage works and farm. From D. Watson, *The Purification of Sewage: with special reference to the Works of the Birmingham Tame and Rea District Drainage Board* (Birmingham, 1903). Reproduced with permission of the Library of Birmingham, Ref: L45.41/178142.

[41] Adderley continued his action but there were negotiations and thawed relations over certain issues that dated back to 1858, such as removing the injunction restraining Birmingham from connecting up new sewers see Rosenthal, *River Pollution Dilemma*, pp. 79-85.

[42] See Appendix 1: Index of Persons. William Harris was a key Birmingham individual trained as an architect and surveyor and was founding member of the Birmingham Liberal Association. He was considered the architect of the election winning strategy during the Liberal takeover of Birmingham council. For a pen biography of Harris see A. Reekes, *The Birmingham Political Machine: Winning Elections for Joseph Chamberlain* (Alcester, 2018), pp. 17-18.

In an ironic twist, Birmingham's Water Committee minutes reveal that as soon as the council took charge of the waterworks, there were legal disputes with the surrounding local authorities because of their 'sewage nuisance' to the River Tame and its tributaries, under the River Pollution Act 1876.[43] One protracted complaint was with Aston Manor Sanitary Authority where several residents discharged directly into the tributary Plants Brook. Birmingham council considered that Aston Manor had the responsibility for taking legal action against those residents, and should of course incur the legal costs of doing so. Aston Manor responded that they had very few options since threatening the residents with legal action would be costly and most likely result in an ineffective judgement of just 'using the best means available', a recognised weakness of the River Pollution Act 1876.[44] Aston Manor, in turn, criticised Birmingham's sewage operations on adjacent land which, they considered, also polluted Plants Brook. In the end Aston Manor's attitude was that if the nuisance bothered Birmingham council so much, then the latter should pay for it, as they had far greater financial resources and 'ought not to seek to throw upon a small district' the burden of protecting Birmingham's interests.[45] This highlights the difficulties faced by all, with smaller local authorities with less available revenue from rates trying to answer their own sewage question. Also, for Birmingham council, there were problems trying to navigate the responsibilities with the waterworks, the closely associated joint drainage board and the continuing litigation with the Adderley case. For the smaller authorities, the expense of sewerage and sewage treatment projects

[43] For more on the Act see Rosenthal, *River Pollution Dilemma*, pp. 22-24.
[44] BAC, MS944/4, Water Committee minute book July 1875-June 1878, Minutes 28 September 1877.
[45] *Ibid.*

and the threat of litigation over polluting water sources made joining the BTRDDB an attractive prospect. Each local authority retained responsibility for its own sewerage up to the point where it connected with BTRDDB infrastructure. To share the burden, some of the smaller authorities created joint schemes under which they linked to each other's sewers, thus forging a combined route to the outfall works.[46]

Hassan argues that many English and Welsh towns invested in water supplies first but did not pay equal attention to or invest in their sewage treatment and disposal arrangements.[47] As shown, the situation for Birmingham was different. It could be argued that the failed attempt to municipalise the waterworks in 1869 and the subsequent sewage crisis of 1871 were in some ways fortuitous. Being compelled to tackle the sewage question first provided the future administrators of a municipal water supply with a good education on the issues of river pollution, sewage treatment and protection of water sources. Significantly, with Avery directing both the water and wastewater operations, one man was in essence at the head of a water authority for over a decade. Other council individuals, such as George Baker, were also members of the early Water Committee, as well as the BTRDDB. Baker took over as Chair of BTRDDB after Avery's retirement in 1892, continuing the authority of Birmingham's council.[48] This enabled a smoother bureaucratic process despite the appearance of a fragmented administration.[49] BTRDDB was not a temporary measure and even when many of the surrounding local boards were absorbed into Greater Birmingham, it

[46] Aston Manor, Handsworth, Smethwick and Erdington created a joint sewerage scheme in 1899. BAC, BCC/1/EZ/1/1/1, Minute book of Aston and Handsworth Joint Sewerage Committee (1899-1911).
[47] J. Hassan (1985) in B. Harris and J. Helgertz, 'Urban Sanitation and the Decline of Mortality', *The History of the Family,* 24, 2 (2019), pp. 207-226, p. 211.
[48] For more on George Baker, see Reekes, *Birmingham Political Machine*, pp. 93-94.
[49] Hassan, 'Water Industry 1900–51', p. 193.

continued until major changes to the water industry in England and Wales took place in the mid-twentieth century, finally becoming part of the Severn Trent Water Authority in 1974.[50]

The creation of BTRDDB was for Birmingham's benefit but it also brought other districts' waste to the outfall at Saltley, increasing the volume to process. This was at odds with the strategy of the 1871 Sewage Inquiry to exclude as much as possible from the sewers to address pollution of the River Tame. At that time the council did not control the waterworks; once it was municipalised, however, the situation altered, forcing serious attention to the most effective methods to treat sewage and reduce pollution from the outfall. The increased volumes from elsewhere meant that Birmingham council had to continue with the deliberate discouragement of water closets so as not to overwhelm the outfall works. The consequences of this on some of Birmingham's citizens are explored further in Chapter Six, but the next section turns to examining more closely how BTRDDB treated the sewage that arrived at the Saltley outfall and in part, examines the alternative 'dry' conservancy system.

Tackling the Sewage Question

John Sheail offers a good appraisal of Victorian 'dry' and 'wet' waste systems and the prevalent sewage treatment methods used, such as irrigation, or sewage farming, and how that evolved into a specialist activity to process waste from towns.[51] Sheail

[50] Before the introduction of the Water Act 1973, there were twenty-nine river authorities, 160 water supply companies and 1,300 sewage treatment authorities. The Act amalgamated all the companies into ten water authorities, each responsible for water supply, sewage treatment and river protection within its area. The Drainage Board operated until 1965/6 when it became the Tame Upper Main Drainage Authority before in 1974 becoming part of Severn Trent Water Authority which was then privatised in 1989. See Hassan, 'The Water Industry 1900–51'; and see 'Water Sector Overview', *Ofwat* (2023) available at https://www.ofwat.gov.uk/regulated-companies/ofwat-industry-overview/ [accessed 21 April 2023].
[51] Sheail, 'Town Wastes'.

explores the relationship between town and country and the concept of sustainability, particularly in terms of the management of urban wastes and rural or agricultural use and identifies a four-stage model. The first stage involved sanitary engineering in channelling the 'filth' into sewers, rivers and streams. Once the pollution became evident, the potential of the land to 'cleanse the effluents' was promoted, with eminent engineers extolling the potential financial benefits of such schemes. The second stage involved seeking a 'radical alternative' in terms of 'dry' disposal with a view to its potential utilisation in some form on the land. This was a period, which Sheail places in the 1860s, characterised by considerable trial and experimentation across both wet and dry systems to see what worked best in terms of successful use by farmers. The third stage came with the realisation that the major profits promised did not materialise, at which point investment in sewage farming became a specific method of treatment to process urban waste. The fourth and final stage, which Sheail suggests began in the 1880s, occurred when the land-space capacity required for third-stage processing was 'outstripped', motivating a pressing need to find the best technique to resolve river pollution and the sewage question.[52] Using Birmingham as a case study, this section looks for evidence to support or contradict this model.

Finding the answer to resolve the sewage question absorbed the efforts of Royal Commissions, sanitary engineers, agricultural chemists and local authorities across the mid-to-late-nineteenth century.[53] As Birmingham council's 1871 *Sewage Inquiry Report* reveals, towns adopted different approaches and sanitary engineers had to consider specific local factors such as geography, population, available land and, of

[52] Sheail, 'Town Wastes', pp. 189, 208-210.
[53] Sheail, 'Town Wastes'.

course, financial resources. For instance, could Liverpool with the River Mersey that empties into the Irish Sea, ever be compared with inland Birmingham with its much smaller river and tributary system? At that time there was a choice between three principal methods of sewage treatment: precipitation (chemical), filtration and irrigation.[54] After the Inquiry, the committee recommended to the council a combination of chemical and irrigation methods (see Appendix 4). Filtration was immediately discounted as being unfeasible for Birmingham due to the uncertainty of results and whether it would meet the urgent requirements of the Chancery Court injunctions.[55]

The addition of chemicals encouraged the settlement of sewage in tanks, whilst at the same time deodorising the effluent. The settled matter ('sludge') was then either utilised or required disposal which, as later discussion shows, presented difficulties. Although there were many patented chemical processes during this period, it was difficult to determine which chemicals were best.[56] For example, the 'ABC process' of the Native Guano Company used a mixture of alum, blood and clay and the 1871 Report reveals a number of additional processes.[57] The application of lime – the chosen chemical for Birmingham's sewage – continued to be used for sedimentation up until 1901.[58] Chemical precipitation was not completely ineffective, particularly if lime was used, but often the effect was temporary and organic matter was retained in the liquid that entered the rivers.[59] This was merely the first stage of the purification

[54] *Sewage Inquiry Report*, for methods of precipitation, see pp. 54-51; for filtration, see pp. 51-9; and for irrigation, see pp. 59-93.
[55] *Sewage Inquiry Report*, pp. 51-59.
[56] For some examples of patented chemical processes, see *Sewage Inquiry Report*, pp. 43-51.
[57] *Sewage Inquiry* Report, p. 48.
[58] A. E. Harris, *History of the Birmingham Tame and Rea District Drainage Board* (Birmingham, 1927), p. 60.
[59] Rosenthal, *River Pollution Dilemma*, p. 31

process, as irrigation was also used. In contrast, towns such as Leeds and Leamington Spa persisted with a single chemical method, but with poor results.[60]

The agricultural use of water-carriage effluent had been encouraged by Edwin Chadwick in his *Sanitary Report* (1842) and irrigation was promoted during the 1850s and 1860s as one of the best treatment methods with potential 'profitable uses'. The benefits continued to be debated throughout the 1870s.[61] Nicholas Goddard suggests that the reason this method became so attractive to local authorities was because of the hope of recouping expensive sewerage costs.[62] When supporting Birmingham council's 1861 Bill to acquire land, the engineer, Robert Rawlinson, suggested that the council might generate a profit of £90,000 per annum from the application of sewage to land.[63] These circumstances in Birmingham closely align with the first stage of the model identified by Sheail.

The considered sustainable use for urban sewage was to irrigate farmland to grow crops. Irrigation or sewage farming (the reason why early waste treatment plants were called sewage farms) operated using two methods. One was to cut trenches or gutters into the land, so that liquid sewage could run into the channels to fertilise crops and produce a better yield. Simultaneously, this broad irrigation treated the effluent, by removing the more polluting elements before they reached the watercourse. The second method, intermittent downwards filtration, involved treating the sewage at a greater depth and in effect using the soil as a filter (Fig. 4.4) – an

[60] *Ibid.*
[61] Chadwick had been inspired by a system used in Edinburgh; C. Hamlin, 'Edwin Chadwick and the Engineers, 1842-1854: Systems and Anti-systems in the Pipe-and-Brick Sewers War', *Technology and Culture*, 33, 4 (1992), pp. 680-709, p. 685; Sheail, 'Town Wastes', p. 196; Luckin, *Death and Survival*, p. 102.
[62] Goddard, 'Nineteenth-Century Recycling'.
[63] Watson, The *Works*, p. 6.

approach favoured by the chemist, Edward Frankland.[64] Land was under-drained with shallow lagoons for the liquid sewage to be absorbed into the ground. Once filtered, the liquid was collected and delivered by pipework to the watercourse.[65] BTRDDB used both types of irrigation before the effluent was discharged into the Tame, reporting that up to ninety per cent of impurities were dealt with. However, storm surges after heavy rainfall inevitably upset the processes of gradual filtration and at times meant that untreated sewage still entered the river.[66]



Figure 4.4: Preparing the Land at Saltley for Irrigation

Image taken from J. D. Watson, *The Purification of Sewage: with special reference to the Works of the Birmingham Tame and Rea District Drainage Board* (Birmingham, 1903). Reproduced with permission of the Library of Birmingham, L45.41/178142.

[64] Rosenthal, *River Pollution Dilemma*, p. 27; Sir Edward Frankland (1825-1899), British chemist and member of the second Royal Commission into river pollution, particularly noted as an expert on water quality and analysis. See C. A. Russell, 'Frankland, Sir Edward (1825-1899)', *ODNB,* https://doi.org/10.1093/ref:odnb/10083 [accessed 8 May 2023].

[65] Rosenthal, *River Pollution Dilemma*, pp. 26 -27

[66] Rosenthal, *River Pollution Dilemma*, pp. 86-87. This was because it was a combined sewer where everything went into the sewers. At the time of the Sewage Inquiry the surveyor W. S. Till had stated that it was impractical for Birmingham to convert to a separate system, despite other authorities warning of the issues.

On its creation in 1877 the BTRDDB had inherited 260 acres of land at Saltley. Four years later this had increased to over 1,200 acres, with subsequent continual expansion along the Tame Valley between Saltley and Forge Mills to cover an area of approximately 2,812 acres (the area highlighted in black in Fig. 4.3).[67] By 1910 (see Appendix 5) the sewage works saw extensions at Minworth and Curdworth, and additional outfall sewers at Witton, Gravelly Hill, Erdington and Sutton Coldfield.[68] By 1896 the sewage farm operation needed further expansion to deal with greater volumes of waste. An extension based on the engineer Charles Hawksley's plans cost £400,000.[69] However, legal challenges persisted when in 1899 the Tamworth Authorities questioned whether the extensions were adequate. Another engineer, William Santo Crimp, was consulted as part of this action: he advised that the design was sound but of inadequate scale and suggested additional work. This cost a further £100,000, demonstrating the scale and cost of operations and how much more land was required.[70] By 1905 the BTRDDB owned the largest sewage farm in England and the third largest in Europe.[71] It was there that stage three of the model was applied, with much of the land used for processing waste rather than for farming to

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[67] Watson, *The Works*, p. 3. This was before the addition of the Sewage Works at Yardley which added a further 144 acres.

[68] J. D. Watson, 'Birmingham Sewage-Disposal Works. (Including Appendix and Plates at Back of Volume)', *Minutes of the Proceedings of the Institution of Civil Engineers*, 181 (1910), pp. 259-316, p. 270.

[69] Watson, *The Works*, pp. 3-4. Charles Hawksley (1839-1917) was a British civil engineer and son of the civil engineer Thomas Hawksley F.R.S. He entered a partnership with his father and became noted for work in water-related projects. A member of the Institute of Civil Engineers from 1867, he was elected president in 1901; 'Obituary: Charles Hawksley, Past-President, 1839-1917', *Minutes of the Proceedings of the Institution of Civil Engineers*, 211, 1921 (1921), p. 396.

[70] Watson, *The Works*, pp. 3-4. The Adderley case had only been discharged 5 years earlier. William Santo Crimp (1853-1901), British civil engineer and Fellow of the Royal Society, was considered an authority on municipal engineering and was the author of *Sewage Disposal Works: A guide to the construction of works for the prevention of the pollution by sewage of rivers and estuaries* (Philadelphia, 1890); see 'William Santo Crimp', *Grace's Guide to British Industrial History* (2020), available at https://www.gracesguide.co.uk/William_Santo_Crimp [accessed 11 May 2020].

[71] Watson, *The Works*, pp. 3-4.

produce crops to sell, as the following land usage breakdown of the total 2,830 acres demonstrates:[72]

- Land used for irrigation 1784
- Land occupied by roads, streams, plantations, buildings, cottage-gardens and areas adjoining public roads (never irrigated) 229
- Reserved for agricultural purposes, dry meadows to pasture cattle and sheep kept to graze irrigated lands 782
- Used for sludge disposal 35

The improvements and extensions across the whole works between 1896 and 1900 allowed the BTRDDB for the first time to cope with and treat stormwater with separate tanks. Chief engineer Watson made consistent improvements and confidently claimed in 1912 that the BTRDDB could 'treat up to six-times the dry weather flow'.[73]

Simultaneously, as the sewage farm expanded, the application of scientific knowledge led to the bacterial treatment of sewage.[74] In 1899, Watson drew on this new knowledge and conducted practical experiments at the Saltley plant, trialling two different types of bacteria bed (contact and percolation) with encouraging results, news of which he shared in a speech at the University of Birmingham in 1903.[75]

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[72] Information drawn from J. D. Watson, 'Birmingham Sewage-Disposal Works. (Including Appendix and Plates at Back of Volume)', *Minutes of the Proceedings of the Institution of Civil Engineers,* 181 (1910), pp. 259-316, p. 261.

[73] Watson, *The Works*, p. 60.

[74] For more on bacterial treatment discoveries, see Watson, 'Birmingham Sewage-Disposal Works', p. 262; C. Hamlin, 'William Dibdin and the Idea of Biological Sewage Treatment', *Technology and Culture,* 29, 2 (1988), pp. 189-218.

[75] The expansion and experimental bacteria beds were reported in 'Birmingham New Sewage Works', *The British Architect*, 6 October 1899; J. D. Watson, *The Purification of Sewage: with special reference to the Works of the*

Watson's experiments drew the same conclusion as the Iddesleigh Royal Commission (1898-1915), namely that bacterial methods enabled a large quantity of sewage to be purified on a limited area compared to sewage farm treatment.[76] This was a breakthrough for BTRDDB, at stage four of the model, with the sewage farm having to expand in line with the population and running out of available land. An extra fifty acres per annum was needed to keep pace with irrigation, whereas one acre of bacteria bed could do the same work.[77] Despite recent expenditure, BTRDDB placed its faith in the chief engineer's pioneering work and quickly authorised Watson to construct several permanent bacteria beds. Watson designed and oversaw the construction of the country's first large percolating plant, at a cost of over £386,000, excluding land costs. By 1912, there were fifty-four acres of percolation filters at Saltley and thirty acres of dry weather flow bacteria beds at Minworth, with additional acres for excess flow beds (see Appendix 5).[78] It had taken thirty years of infrastructure expansion with much experimentation with various methods to reach the point where Birmingham was at the forefront in terms of sewage treatment capabilities. The next section continues to explore sustainability throughout the four-stage model through schemes of utilisation and recycling in the town.

Sustainability: Utilisation and Recycling

As part of the first stage, making waste pay was the ideal for local authorities to cover costs of operation, repay loans and even make a profit. There were exaggerated

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Birmingham Tame and Rea District Drainage Board (Birmingham, 1903). A copy is available at BAC, L45.41/178142.

[76] Watson, *The Works*, p. 4; a Royal Commission (under Earl Iddesleigh) was formed in 1898 to investigate and report on methods for treating and disposing of sewage. A motivating factor was the difficulty in obtaining enough land for sewage treatment.

[77] Harris, *History of BTRDDB*, p. 64.

[78] Watson, *The Works*, pp. 6, 66.

expectations about the financial benefit of sustainable agriculture.[79] This applied to both wet and dry waste management. While nightsoil waste had always been sold as manure to farmers, often at a reduced rate, the profitability of liquid irrigation of municipal farm crops proved to be uncertain. BTRDDB devoted a small area (260 acres) to broad irrigation to cultivate crops to sell.[80] In the early years there was an annual profit of just over £500. However, between 1901 and 1903 when the farming operation was at its maximum, £3000 per annum was lost.[81] Although a variety of crops were grown, land had to be managed and its use rotated, so it was also used as pastureland for the grazing of 200 cows by 1903.[82] The milk produced was sold to generate income and supplied to the council's hospitals. With the realisation that sewage farming was not going to generate great profits (stage three), efforts were concentrated on intermittent irrigation as a specialised process to deal with waste. This continued at scale until a full conversion to bacteria bed treatment. BTRDDB eventually let 1,700 acres of their land to tenant farmers and utilised just 300 acres themselves before irrigation and sewage farming finally ceased in 1923.[83]

However, sustainability did not apply solely to liquid sewage. The residual sludge from treatment of sewage had always been an issue. It was one of the nuisances cited during the crisis of 1871 when sludge was spread on the land to dry out and then dug into the soil. The noxious effects and difficulties of disposal occupied the

[79] Sheail, 'Town Wastes', p. 208.
[80] Before extending along the Tame Valley, the original plan had been to have a small model farm to show farmers the benefits, with a view to encouraging farmers on land surrounding the outfall works to purchase the treated effluent.
[81] Harris, *History of BTRDDB*, pp. 35-39.
[82] The earliest record of the herd is found in *Birmingham Daily Post*, 1 August 1878 when it numbered 34 cows producing 110 gallons of milk daily which sold for 9 and a half pence per gallon.
[83] The pastureland would have been treated with sewage for a period of three years; see Harris, *History of the BTRDDB*, pp. 35-39.

attention of authorities and sanitary engineers, who explored different means of utilising this by-product, still underpinned by the concept of generating an income and profit. There was a profusion of processes and patents as engineers and chemists vied to make their fortune. Birmingham's Sewage Committee first explored potential avenues between 1872 and 1874 and trialled General Scott's Process, a chemical precipitation treatment, in their existing settling tanks. The sludge left over was promoted as suitable for the manufacture of cement and the production of 493 bags was recorded between 1872 and 1873. Since mention of this method ceased after 1874, it must be assumed that the project failed to yield the expected profit and attention turned elsewhere. Intriguingly, however, the potential use of sewage sludge ash to produce cement has been revisited in the twenty-first century.[84]

Local authority engineers also worked to find methods that would solve the problem and if not generate a profit, then at least be useful. Edward Pritchard, engineer to Wednesbury Local Board, told those gathered at the 1884 Social Science Congress that methods of sewage sludge disposal involving evaporation or hydraulic pressing, for the manufacture of brick and cement, were commercially unsuccessful. He recommended an alternative method of processing that used compressed air to press out water and form cakes of sludge, but with the familiar purpose to sell them as manure or to fertilise municipal crops.[85] This demonstrates that by the mid-1880s some in the Midlands were either still at stage two or between stages two and three of the sustainability model.

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[84] C. Lynn, R. Dhir, G. Ghataora & R. West, 'Sewage Sludge Ash Characteristics and Potential for Use in Concrete', *Construction and Building Materials*, 98 (2015), pp. 767-779.

[85] E. Pritchard, *What is the best method of dealing with town sewage?* (Westminster, 1884). A copy is available at BAC, L45.42/209883.

Sheail states that the concept of sustainability, in terms of urban waste and land use, became discredited and irrelevant.[86] This may have been true, but sustainability goals persisted in different ways, moving beyond the agricultural approach and instead towards energy generation. Perhaps there is scope to add a fifth stage to the model. By the second decade of the twentieth century BTRDDB was experimenting with the bacterial digestion of sludge, with Watson claiming that sewage sludge was finally processed 'without nuisance from smell'.[87] By 1921 an experimental plant was constructed to determine 'the commercial possibility of utilizing for power purposes the gases given off by the digestion of sludge', what we now refer to as biogas. By 1925 the BTRDDB had installed the first unit of a power plant powered by biogas at Saltley, utilising this 'in an internal combustion engine of 150 B.H.P. to generate electricity'.[88]

Birmingham's wet waste management system closely followed stages one, three and four of the sustainability model, although later than suggested by Sheail. Birmingham also followed stage two exploring 'radical alternatives' in the development of 'dry' forms of disposal. The next section explores Birmingham's dry system which operated concurrently between 1873 and 1914. The installation and collection operation of that system is explored in Chapter Six, but the disposal methods receive attention here due to the theme of sustainability and schemes of utilisation and recycling.

[86] Sheail, 'Town Wastes', p. 210.
[87] For an image of a sludge digesting tank, see Figure 8 in Watson, *The Works*, p. 29; Watson, 'Birmingham Sewage-Disposal Works', p. 274.
[88] Harris, *History of the BTRDDB,* pp. 53-66.

Birmingham's Dry Disposal System

After examining the various conservancy schemes used by other towns, the attention of the Sewage Inquiry Committee was drawn to the systems already in use in Manchester and Rochdale.[89] The final decision was to adopt the pail system used in Rochdale, which in Birmingham became known as the 'pan system'. It was administered through a new 'Interception' department running alongside the existing nightsoil department.[90] Originally instigated under the Sewage Committee, interception was not under the authority of the BTRDDB, but instead remained under council control and was the responsibility of the Health Committee from 1876.[91] The following section describes how that system developed to dispose of the contents of pan privies and explores its relevance to concepts of sustainability.

Technology and Waste

The collected contents of the new pan privies and the separate ash tubs plus the nightsoil from ashpits, which continued concurrently, were delivered for suitable disposal to the council wharves situated around the city centre.[92] Ashes formed a major part of household refuse but, despite instructions to the contrary, pans and tubs

[89] *Sewage Inquiry Report,* pp. 19-40 offers overviews of the systems in place at Liverpool, Bolton, Manchester, Rochdale, Leeds, Nottingham and Hull, with recommendations on pp. 41-42.
[90] For more on the Rochdale pail system, see Crook, *Governing Systems*, pp. 180-184 and for more details on the Birmingham pan system, see Chapter Six of this thesis.
[91] The Health Committee (formerly the Sanitary Committee and before that the Borough Inspection Committee) was renamed in 1876 as the council's responsibilities increased following the Public Health Act 1875.
[92] Birmingham council had a number of 'Corporation Wharves', but the main ones for the pan system in 1885 were at Montague Street, Shadwell Street and Rotton Park Street; see Bunce, *History of the Corporation II,* p. 148.

often included vegetable and animal matter as well as metals, rags and glass which were scavenged by hand and sold (see Table 4.1).[93]

Type of Waste	1903 Tons	1904 Tons	1911 Tons
Refuse sent to tips	15,270	29,382	17,295
Refuse burned in furnaces	121,548	120,914	124,483
Mixed manure, ashpit manure, market refuse (sent to tips by boat, to fields by cart or sent away by rail).	66,388	61,384	*13,593
Brickends and pots sent to tips	200	312	175
Material sold: Glass	26	26	1
Material sold: Scrap tin and galvanised iron	452	393	240
Totals	**203,884**	**212,465**	**155,606**

Table 4.1: Types of Waste Disposed of by Birmingham Council and Method (burning, tipping or recycling).[94]

For the first few years of the pan system, disposal followed the existing arrangements for nightsoil in producing a manure to sell to farmers. Pan contents were mixed with ashes and samples were sent to farmers to trial.[95] Manure had always been sold at a low rate to encourage farmers to purchase it and all the department had to do was

[93] T. Cooper, 'Rags, Bones and Recycling Bins', *History Today,* 56, 2 (2006), p 1 of 6.
[94] Figures taken from BAC, BCC1/AR/3/1/6 , Interception Sub-Committee Minutes and BCC1/BP/1/1/1, Lighting, Stables and Refuse Disposal Minutes. *Note that by 1911 mixed manure had decreased significantly and is recorded as sent to farmers and market gardeners. This corresponds to the increase in water closets due to the arrival of water supply from Wales after 1904.
[95] BAC, BCC1/AW/1/1/1, Sewage Committee Minutes, 22 November 1874.

sell from the wharf as farmers came to collect. However, with a limited local market and competition from other fertilisers, increasingly there tended to be a surplus. Anything not sold was disposed of in land tips, which became increasingly expensive as land had to be purchased or rented. Increased demand due to the volume of waste and the scarcity of land pushed up the price. There were also haulage costs as tips were often at a distance from population centres so as not to constitute a nuisance. Inevitably, as the pan system expanded,[96] so too did the disposal costs, forcing the council to seek better solutions. Birmingham's late adoption of major sanitary projects in comparison with other towns did offer one benefit: it gave the opportunity to assess the effectiveness of systems already in operation and the costs involved.[97] For example, in 1876, Birmingham council quickly followed Manchester's early lead in employing new technology to destroy waste by fire and installed an Alfred Fryer 'destructor' at the Shadwell Street Wharf to burn refuse.[98]

When describing stage two of his model, Sheail refers to the controversy over whether liquid wastes or dry forms were best for sustainable use on the land.[99] This debate encouraged the search for alternative methods for using human waste as a fertiliser.[100] In 1877, Birmingham's Interception Department looked to new technology designed to process and evaporate privy pan contents to produce a valuable fertiliser. It hoped that 'poudrette' would be as commercially viable as guano

[96] By the end of 1874 and just over a year in operation there were 3,845 pans; by 1877 this had increased to 22,668 (and included schools and factories). By the mid-1880s there over 38,000 pans in the system collected and returned to the three main wharves at Shadwell Street, Montague Street and Rotton Park Street.
[97] A. Briggs, *Victorian Cities* (Middlesex, 1963), pp. 214-226. The 1871 Sewage Inquiry offered Birmingham council the opportunity to look at what other towns had already done and make assessments.
[98] W. A. Power, *Filth Removal: Progress at Liverpool and Birmingham* (Dublin, 1877), p.11; Bunce, *History of the Corporation II,* p. 142. For more on the Alfred Fryer Destructor, see Crook, *Governing Systems*, pp. 190-194; T. Cooper, 'Rags, Bones and Recycling Bins', pp. 2 & 3 of 6; by 1912 there were 338 refuse destructors in Britain.
[99] Sheail, 'Town Wastes', p. 208.
[100] *Ibid.,* p. 194.

and achieve that sustainability goal combined with making a profit.[101] The first attempt involved a Fryer's patented drying machine, which was adapted from earlier designs for processing sugar cane, but this was considered to be 'imperfect'. However, the experiment had shown that the heat generated by the refuse destructor could be utilised by the drying machine. Next came the Firman dryer (see Figs. 4.5 & 4.6), which evaporated the pan contents to a fine powder.[102] After an investment of £25,000 for buildings and machinery, by 1880 there were three Firman dryers at work at the Montague Street wharf, each capable of dealing with one and a half tons of pan contents.[103]

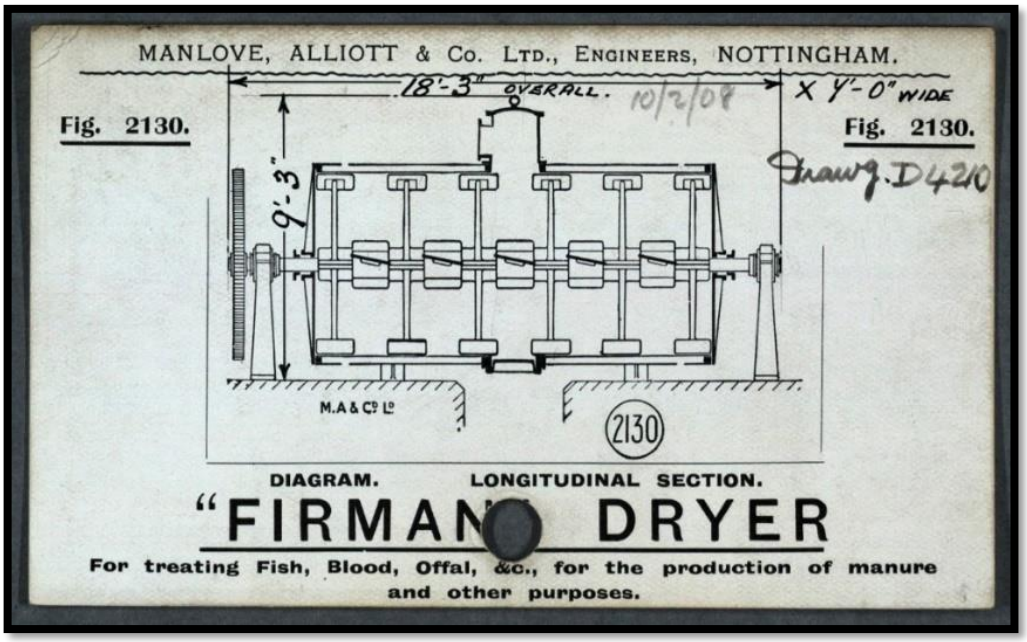


Figure 4.5: Example of Firman Dryer, Longitudinal Section (n.d.).
Image and permission to reproduce by University of Nottingham Manuscripts and Special Collections, Al D 12/6 Fig. 2130.

[101] Power, *Progress at Liverpool and Birmingham*, pp. 10-11, 13-14.
[102] Bunce, *History of the Corporation II*, p. 142.
[103] BAC, BCC1/AR/3/1/2, Interception Sub-Committee Minutes, 5 August 1880.

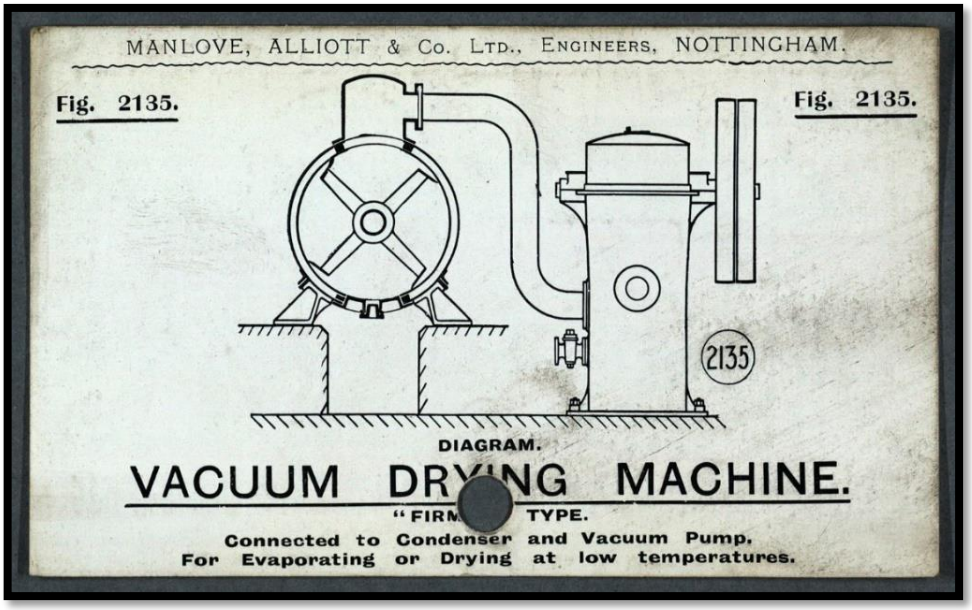


Figure 4.6: **Example of a Vacuum Drying Machine, Firman Type (n.d.).**
Image and permission to reproduce by University of Nottingham Manuscripts and Special Collections, Al D 12/6 Fig. 2135.

Later, when the plant was extended, larger machines processed a greater quantity of pan contents in less time and extra destructors were installed at plants in Halliday Street and Newtown Row. Burning refuse reduced the weight by at least seventy per cent, thus cutting land tip and haulage costs. By the end of the century the department was dealing with 4,000 tons of refuse a week and forty-seven furnaces were reducing this to 700 tons for land tip.[104] Table 4.1 details the quantity of refuse and manure that was burned or sent to tip, along with the quantity of other refuse recycled and sold.

The corporation did not initially collect trade refuse but after repeated requests and the introduction of the new destructor technology, a chargeable service began from about 1881. This was also advantageous for the council as more waste served as

[104] C. A. Vince, *History of the Corporation of Birmingham, Vol. III* (Birmingham, 1902), pp. 119-120.

extra fuel to raise steam to power the dryers, thus saving on coal. By the end of the century, the Interception Department was disposing of pan contents, ashes, animal matter from abattoirs, vegetable refuse from the markets and street sweepings.[105]

The poudrette fertiliser and concentrated fish manure (made from trade waste fish offal) did find a market for a time. The council employed a salesperson and for 1890-1895, poudrette manufacture generated an average annual profit of £545.00. Clinker, a by-product of burning refuse in the destructors, was used as road filling and to make cement. As much as possible was sold to generate income and reduce the amount sent to tip, again demonstrating that sustainability went beyond agricultural use. The department even ground the clinker and produced its own paving slabs, using the steam power raised by the destructors, to utilise as much of Birmingham's waste as possible.[106] The council had developed a rational interconnected and technological system of waste disposal and utilisation. It answered the land tip problem at that time, although landfill techniques would return to widespread use by the mid-twentieth century.[107] However, there were consequences as destructors and the burning of waste to power other technology and for the production of gas and electricity added to the environmental dilemma surrounding smoke pollution.[108] The council, responsible for enforcing nuisance abatement, including for smoke, must have become one of the biggest producers of smoke nuisances in dealing with the city's waste. In 1894, the residents of Saltley objected strongly to the building of a

[105] BAC, BBC1/AR/3/1/2, Interception Sub-Committee Minutes, 7 January 1881 and BCC1/AR/3/1/6, 5 February 1903. In 1903 it was reported that income of over £708 was generated by collection and disposal of trade waste.
[106] Such slabs were used to pave the floor at the new covered market in Smithfield; see Vince, *History of the Corporation III*, p. 120; Crook, *Governing Systems*, p. 192.
[107] Luckin, *Death and Survival*, p. 109.
[108] *Ibid.*, pp. 108-114.

new destructor in their ward, arguing that they had enough 'municipally-owned nuisances', from the sewage farm and gasworks.[109]

Birmingham's municipal and BTRDDB responses to the sewage question followed Sheail's four-stage model, although not necessarily in a neat linear succession. Sustainability through the utilisation and recycling of waste and its by-products underpinned the council's early attempts to answer the sewage question and went beyond merely supporting agriculture. Nicholas Goddard suggests that the 'Victorian preoccupation' with recycling had been largely forgotten and, writing in 1981, highlighted that sludge was still being applied to the land with benefit. At a time when the whole field of 'recycling' was being 'renewed with a sense of urgency'[110], Goddard hints at parallels and linkages between past research into the useful components of sewage and the emergence of innovative ideas and developments in the twenty-first century. More recently, Henry Irving has also reflected on how the history of waste management can offer a 'vantage point from which to consider current debates' and argues that urban history can offer a critical understanding of the present.[111]

Legacies and Parallels

The sewage works at Saltley eventually became obsolete and the land was redeveloped as the Gravelly Hill Industrial Estate in the 1970s, close to the Gravelly

[109] Crook, *Governing Systems*, p. 192.
[110] Goddard, 'Nineteenth-Century Recycling'.
[111] H. Irving, 'The War on Waste: Using Urban History to Inspire Behavioural Change', *Urban History*, 48 (2021), pp. 307-319, p. 307.

Hill Interchange, commonly known as 'Spaghetti Junction'. The plant at Minworth continued and expanded and was described in 2022 as Europe's second-largest sewage works and the largest within Severn Trent, serving 2 million people.[112] Sustainability is reported to be at the core of the company's policy and present-day utilisation or recycling schemes echo past initiatives. For example, in 2008 treated wastewater was being used to irrigate crops on Midlands farms due to the soaring price of animal-based fertilisers.[113] Similarly, the 2016 annual report revealed how crops such as maize, wheat, rye and energy beet were grown on Severn Trent land, not to sell as produce as in the early sewage farming schemes, but instead to harvest, store and pickle in their own juices to produce silage to fuel anaerobic digesters.[114] Digesters are now at the forefront of Severn Trent's renewable energy scheme with a Thermal Hydrolysis Plant at Minworth using anaerobic digestion to break down solid waste extracted from the treatment process. Continuing the utilisation of waste ideal from the past, the nutrient-rich material is then sold to farmers and the biogas by-product used to generate renewable electricity.[115] Similarly, since 2008, Anglian Water has been using the technology of generating electricity from combined heat and power (CHP) plants. This involves taking sewage sludge cake, processing and mixing it with liquid sludge prior to anaerobic digestion

[112] *Severn Trent* (2016-2023), https://www.severntrent.com/about-us/ [Accessed 7 May 2023].
[113] J. Oldham, 'Human Sewage used on Crops in the Midlands', *Birmingham Mail* [online], 26 July 2008, https://www.birminghammail.co.uk/news/local-news/human-sewage-used-on-crops-in-the-midlands-233364 [accessed 22 February 2023].
[114] Severn Trent Plc, *Inside AMP6* (2015) https://www.severntrent.com/content/dam/stw/ST_Corporate/About_us/Docs/Inside-AMP6-brochure.pdf [Accessed 14 August 2019]
[115] H. Leach, 'Minworth Sewage's Important Role as Severn Trent Discovers False Teeth, Underwear and Bike Parts', *Birmingham Mail* [online] available at https://www.birminghammail.co.uk/news/midlands-news/minworth-sewages-important-role-severn-25812573 [accessed 26 February 2023]. See also 'Minworth Thermal Hydrolysis Plant, Severn Trent', *MWH Treatment* (2023) available at https://mwhtreatment.com/case-study/minworth-thermal-hydrolysis-plant/ [accessed 21 April 2023].

to produce a biogas which is stored and used to power four CHP engines to generate electricity.[116] This is evidence that the modern water industry is concentrating on sustainable models for agriculture and energy. Generating renewable energy forms an important part of current policies, and modern technologies make this more achievable than did the more basic experiments conducted in the early twentieth century.

A further parallel can be drawn between the mid-to-late nineteenth-century sewage question and the challenges and debates faced by the early twenty-first-century water industry. River pollution is again a serious problem due to frequent stormwater discharges from Combined Sewer Overflows, a legacy of the Victorian sanitation revolution, and other pollutants from agricultural practices.[117] Late 2022 and early 2023 marked the high point of campaigns by environmental activists and charities critical of the privatised water industry in England and Wales. At the time of writing (2023), public pressure has been mounting politically on the UK government and regulator Ofwat to intervene through legislation and impose heavy fines for the pollution of rivers and seas.[118] The singer and angler, Feargal Sharkey, has become

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[116] 'That's the Power of Poo!', *Water Industry Journa*l, available at https://www.waterindustryjournal.co.uk/thats-the-power-of-poo [accessed 25 February 2020].

[117] 'A Chemical Cocktail of Sewage, Slurry and plastic is Polluting English Rivers', *Manchester 1842: The University of Manchester (n.d.*), [News] posted 13 January 2022 https://www.manchester.ac.uk/discover/news/a-chemical-cocktail-of-sewage-slurry-and-plastic-is-polluting-english-rivers/#:~:text=11%3A41-,A%20'chemical%20cocktail'%20of%20sewage%2C%20slurry%20and%20plastic%20is,Environmental%20Audit%20Committee%20has%20claimed [accessed 14 May 2023]; Department for Environmental and Rural Affairs, *Storm Overflows Discharge Reduction Plan* (London, 2022) https://assets.publishing.service.gov.uk/media/631063778fa8f5448a3836e4/Storm_Overflows_Discharge_Reduction_Plan.pdf [accessed 14 May 2023].

[118] The regulator of water industry in England and Wales is Ofwat see https://www.ofwat.gov.uk/ . Environmental charities examples include: *Surfers Against Sewage* https://www.sas.org.uk/ ;*Windrush Against Sewage Pollution* (2021) https://www.windrushwasp.org/. Prominent environmental campaigner Feargal Sharkey in the 2020s became a key figurehead of the campaign to stop water companies discharging sewage in British rivers; see F. Sharkey, 'Feargal Sharkey's Mission to Protect England's Rivers and Streams', *The Countryside Charity (n.d.),* https://www.cpre.org.uk/stories/feargal-sharkeys-mission-to-protect-englands-

one voice amongst many in the campaign to stop private water companies from discharging sewage into British rivers. Sharkey and other celebrity campaigners have assisted environmental charities to raise public awareness. For example, the comedian, writer and angler, Paul Whitehouse's 2023 television programme *Our Troubled Waters* achieved great publicity and provoked a government response via its blog.[119]

However, this is not a new reaction to the problem of river pollution. Dennis Mills, in his study of Lincoln's sewers between 1848 and 1850, also drew parallels with a modern-day major civil engineering project, to address the continued pollution of the River Thames in London. Mills was referring to the twenty-five-kilometre Thames Tideway Tunnel, or London's 'Super Sewer' when it was at its design stage in 2007.[120] The project aims to 'prevent the tens of millions of tonnes of pollution' that enter the River Thames every year. Joseph Bazalgette's Victorian overflow for stormwater surges was designed at a time when London had a much smaller population of 4 million, but it discharges straight into the river, as an emergency measure to prevent flooding of the city. In twenty-first-century London, with a population of 9 million, the emergency system discharged almost weekly. This major engineering undertaking started in 2016 and is expected to be operational by 2025, with a capital cost of £4.5 billion for this single upgrading project, based on 2023

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rivers-and-streams/ [accessed 22 April 2023]. Examples of newspaper reports include: C. Hodgson and P. Plimmer, 'Water Company Prosecutions Fall in England Despite Thousands of Pollution Warnings', *Financial Times* [online], 2 February 2023 https://www.ft.com/content/f05b7a5e-0445-47ed-968e-ce75ee14ce48 [accessed 22 April 2023]; T. Bawden, 'Wild Swimming: 12 Tips on how to Swim in UK Rivers and Cut the Risk of Getting Sick from Pollution', *iNews* [online], https://inews.co.uk/news/environment/wild-swimming-12-tips-on-how-to-swim-in-uk-rivers-and-cut-the-risk-of-getting-sick-from-pollution-2289293 [accessed 22 April 2023].

[119] *Paul Whitehouse: Our Troubled Rivers*, 2 Episodes, BBC2 shown on 5 and 12 March 2023; 'DEFRA in the Media' [Blog], posted 6 March 2023, *GOV. UK* https://deframedia.blog.gov.uk/2023/03/06/government-response-to-our-troubled-rivers-documentary/ [accessed 13 May 2023].

[120] D. R. Mills, *Effluence and Influence: Public Health, Sewers and Politics in Lincoln, 1848-50 (*Lincoln, 2015).

annual accounts.[121] Growing populations and climate change with greater rainfall have placed huge demands on an ageing sewerage and sewage treatment infrastructure. For Britain, and many other developed nations, the 'sewage question' for the twenty-first century is how best to upgrade and modernise existing systems to increase capacity and reduce pollution of rivers and seas. However, the approach is substantially a continuation of approaches pursued by the Victorians and their successors.

Conclusions

Birmingham's sewage crisis, and the council's efforts to deal with it effectively, provides a case study for exploring river pollution and environmental dilemmas of the nineteenth century. It was not the Public Health Acts of the 1870s that finally forced Birmingham council to address its sewage and waste problems; instead, it was a sewage nuisance law case. Rosenthal's study identified the significance of this case, emphasising its protracted nature and its impact on efforts to deal with pollution. The present thesis adds to Rosenthal's work, demonstrating how the Adderley case took on greater significance once the council took ownership of the waterworks. It became a powerful driver for the creation of the BTRDDB as a means to control what was being discharged into the River Tame by other authorities. Exploring the motivations

[121] B. Smart, 'Thames Tideway 'Super Sewer' Cost Holds Steady at £4.5bn', *New Civil Engineer* [online], 29 August 2023 https://www.newcivilengineer.com/latest/thames-tideway-super-sewer-cost-holds-steady-at-4-5bn-29-08-2023/#:~:text=Tideway%2C%20the%20company%20building%20London's,bn%2C%20as%20reported%20in%20April [accessed 25 November 2023]. For information on the London Super Sewer project, see 'The Tunnel', *Tideway*, available at https://www.tideway.london/the-tunnel/#sub-nav [accessed 1 May 2023]. For more about Joseph Bazalgette, see Halliday, *The Great Stink of London*.

for the creation of 'large-scale technical' systems has revealed the deliberate 'entanglement' and development of early water authorities and public utilities.[122] It also reveals that key individuals within the council took ownership of the issue and worked through these challenges over considerable periods of time. There was an active municipal response which engaged new technology and scientific knowledge, illustrating that Birmingham's experience highlights the important contribution of engineers working for local authorities. They took scientific knowledge and applied it in practice through trials and experimentation. Many different treatment methods were tried at Saltley and Minworth, culminating in the development of the first large-scale plant of bacteria beds. However, sewage is merely one pollutant of rivers. Despite the development of effective methods of sewage treatment, the River Tame and River Rea – as part of 'an industrial river basin' – were subject to other pollutants.[123]

Furthermore, this case study has offered an opportunity to examine the theory and practice of Victorian and Edwardian sustainability through the schemes of utilisation and recycling. Birmingham followed Sheail's four-stage model, although stages two and three ran concurrently and some stages occurred later than Sheail suggests. This study also demonstrates that sustainability moved beyond agricultural land use and began to look towards energy. Interestingly, parallels can be drawn between the nineteenth-century sewage question and methodologies on the one hand and present-day debates and practices surrounding the water industry, river pollution and

[122] T. Crook, 'Thinking Ecologically: A Systems Approach to the History of Medenv', [Blog], *MedEnv Network*, uploaded 10 September 2020. https://medenvnetwork.wordpress.com/2020/09/10/thinking-ecologically/ [accessed 30 September 2020].
[123] See N. Harkness, 'The River Tame – A Short History of Water Pollution and Control within an Industrial River Basin', *Water Science Technology*, 14 (1982), pp. 153-165.

sustainability on the other. These signal the huge future investment that will be required to upgrade existing systems, as is evident in the Thames Tideway project.

The Adderley legal case had a significant impact in forcing Birmingham to address its sewage crisis and environmental damage, but it had a further enduring impact. In combination with issues around water supply, it led to a municipal policy of deliberate discouragement of water carriage between 1871 and 1904. The impact of this will be explored in Chapter Six. Effective treatment of sewage after 1903 was crucial for Birmingham's sanitation but equally important was the need for a plentiful water supply. The next chapter examines the early years of the waterworks under council control, with the challenges of being solely reliant on local sources of water supply, and the move towards securing a new supply through the Elan Valley Water Scheme.

Chapter Five

From Well to Tap: Birmingham's Water Supply 1876 -1915

Introduction

When the council took over the waterworks on 1 January 1876, the daily distribution was just over 8 million gallons using local sources of supply. At the start of the twentieth century, the council water department still relied locally 'on five streams and six deep wells' providing about 18 million gallons of water per day (see Table 5.1). From 1904 this changed when Birmingham's new water supply was transported along the seventy-three miles of the Elan Valley aqueduct.[1] This was the result of a major civil engineering project which began in 1893 for the construction of reservoirs and dams on the rivers Elan and Claerwen in mid-Wales.[2] The first phase of this ambitious scheme increased distribution to 27 million gallons of water per day.[3]

The existing historiography on water supply in England and Wales confirms that Birmingham was not the pioneer with its Elan Valley Scheme, as Liverpool, Manchester and Glasgow were among the first cities in Britain to transport water over a distance.[4] Therefore, there has been an understandable focus on Liverpool but also on the capital, London, which was notable for its difference in retaining water supply

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[1] *Severn Trent Water* (2023) https://www.stwater.co.uk/in-my-area/your-water/ (accessed 23 May 2023).
[2] Construction began in 1893. *History of the City of Birmingham Water Department* (Birmingham, 1974), pp. 8-9. For the plan showing position of the works on watershed, see J. Reinarz, 'Industry and Illness: Investing in Health and Medical Provision' in C. Chinn and M. Dick, *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 239-259, p. 255. Also, see this short film showing the scale and result of this Victorian engineering project (this is a shorter version of the film shown in the Elan Valley Visitor's Centre on a site visit in August 2022) Welsh Water, Elan Valley: A Living Landscape - Short English Film, *YouTube* https://www.youtube.com/watch?v=kTLxmfIEfHU (accessed 16 August 2022).
[3] D. Lewis Brown, *The Elan Valley Clearance* (Eardisley, 2019), p. 70.
[4] O. Roberts, 'The Politics of Health and the Origins of Liverpool Lake Vyrnwy Water Scheme, 1871-92', *Welsh History Review,* 20, 2 (2000), pp. 308-335, p. 311.

in private hands in contrast to widespread provincial municipalisation.[5] Studies have assessed motivations for establishing or taking over waterworks; examined questions of quality and quantity; and analysed public versus private ownership.[6] For example, Owen Roberts explores the political and ideological influences on water policy and argues that initiatives for reform emanated from local government.[7] Similarly, John Broich, when exploring why London differed, suggests that the 'development of water systems involved significant development in the system of modern urban governance'.[8] Looking more at issues of supply, Anne Hardy and Bill Luckin agree that the variables of 'quality and quantity' dominated the link between public health concerns and water, as well as a 'continuity of supply'.[9] The arguments for the municipalisation of Birmingham waterworks were based around quality (with the problem of polluted wells) and quantity (in the sense of who had access to water and when).[10] Similar arguments based on 'the relationship between water and health'

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[5] J. Broich, *London: Water and the Modern City* (Pittsburgh, 2013), p. xii.

[6] A. Hardy, 'Parish Pump to Private Pipes: London's Water Supply in the Nineteenth Century', *Medical History*, Supplement No. 11 (1991), pp. 76-93; B. Millward, 'Emergence of Gas and Water Monopolies in Nineteenth-Century Britain: Contested Markets and Public Control' in J. Foreman-Peck (ed.), *New Perspectives on the Late Victorian Economy: Essays in Quantitative Economic History, 1860–1914*, (Cambridge, 1991), pp. 96-124; H. Barty-King, *Water, The Book: An Illustrated History of Water Supply and Wastewater in the United Kingdom* (London, 1992); S. Sheard, 'Water and Health: The Formation and Exploitation of the Relationship in Liverpool, 1847-1900 ', *Transactions of the Historic Society of Lancashire and Cheshire*, 143 (1993), pp. 141-163; J. Broich, 'Water and the Modern British City: The Case of London, 1835-1903' (Unpublished PhD Thesis, Stanford University, 2005); D. Spar and K. Bebenek, 'To the Tap: Public Versus Private Water Provision at the Turn of the Twentieth Century', *Business History Review*, 83, 4 (2009), pp. 675-702; L. Tomory, 'The Question of Water Quality and London's New River in the Eighteenth Century', *Social History of Medicine,* 27, 3 (2014), pp. 488-507; L. Tomory, *The History of the London Water Industry, 1580-1820* (Baltimore, 2017); D. Lewis Brown, *The Elan Valley Clearance*, (Eardisley, 2019); N. Higham, *The Mercenary River: Private Greed and Public Good, A History of London's Water* (London, 2022).

[7] Roberts, 'The Politics of Health', p. 309.

[8] Broich, *London: Water*, p. xii.

[9] Hardy, 'Parish Pump to Private Pipes', p. 76: B. Luckin, *Death and Survival in Urban Britain: Disease, Pollution and Environment, 1800-1950* (London, 2015), p. 106.

[10] Birmingham Archives and Collections, Library of Birmingham (BAC), Severn Trent Collection, MS944/332-333, A copy of *The Royal Commission Report on the Supply of Water* (HMSO, 1869); The Royal Commission Report was quoted in BAC L43.3/31078 T. Avery, *The Corporation of Birmingham and the Water Supply of the Town* (Birmingham, 1869), pp. 17-21.

were also made for taking over the water supply in Liverpool.[11] However, the later Birmingham Water Act 1892 largely focused on quantity. The Bill's passage through Parliament is a good example of what John Hassan describes as the 'scramble' for rights to develop distant sources, which provoked conflicts between local authorities, particularly when the authorities closest to the source were keen to defend their rights 'to appropriate'.[12] David Lewis Brown offers an example of this conflict over Birmingham's 1892 Act as he explores the building of the dams from the perspective of the Welsh communities affected.[13] Other research has looked at the engineering of waterworks and reservoirs in studies on the water schemes for Liverpool, Sheffield, Leeds and Bradford, but there is scope for much to be added here.[14] Examination of the development of Birmingham's water supply can add to the historiography by assessing how effectively Birmingham council dealt with issues of quantity and quality before the arrival of the supply from the Elan Valley and by exploring to what extent public ownership was crucial to the development of Birmingham's supply. This

[11] Sheard, 'Water and Health', p. 163; Roberts, 'The Politics of Health'.
[12] J. Hassan, *A History of Water in Modern England and Wale*s (Manchester, 1998), pp. 39-50.
[13] Lewis Brown, *Elan Valley Clearance*. Brown describes the valleys as they were and traces what became of the 298 men, women and children who lived there before the valleys were flooded.
[14] Roberts, 'The Politics of Health'; R. Coopey, 'Politics, Imperialism and Engineering: The Construction of the Birmingham Welsh Water System, 1861–1952', in J. A. A. Jones, ed., *Water in the Celtic World: Managing Resources for the 21st century: 2nd Inter-Celtic Colloquium, University of Wales, Aberystwyth, 3–7 July 2000* (Wallingford, 2000), pp. 375–378; S. Ewen, 'Sheffield's Great Flood of 1864: Engineering Failure and the Municipalisation of Water', *Environment and History,* 20, 2 (2014), pp. 177-207; A. McTominey, 'Bad Neighbours? Water Supply and the Civic Rivalry of Leeds and Bradford, c.1850–1887', *International Journal of Regional and Local History*, 12, 1 (2017), pp. 24-41; A. McTominey, 'The 'Leeds Lake District': Water Supply, Rural Environment, and the Cultural Landscape in Victorian and Edwardian Britain', *Cultural and Social History,* 16, 5 (2019), pp. 561-579; A. McTominey, 'Water and the Modern Engineered City: The Association of Water Engineers in a British and Transnational Context, 1896–1914', *Water History,* 12, 2 (2020), pp. 131-149; A. McTominey, 'Waterworks, Municipal Government and the Environment in Twentieth-Century Britain', *Urban History, First View* (2023), pp. 1-16.

is motivated in part by the use Joseph Chamberlain's 1874 words in present-day debates on private or public ownership of water companies in England and Wales.[15]

Glen O'Hara suggests that the municipalisation of Britain's 'private water concerns' by provincial and rural authorities was another of the 'natural monopolies' important to Victorian economic growth. Its aim was to secure higher investment and better service.[16] Hence, the economic aspects of waterworks management are explored in this chapter through Birmingham's experience because, as Andrew McTominey suggests, it is 'sometimes neglected in environmental histories of cities'.[17] Additionally, establishing the economic aspects informs debates about the contribution of sanitary investment to the decline of urban mortality in England and Wales. Bernard Harris and Andrew Hinde have expanded on previous research by looking at the full range of loan-financed public works, creating a dataset that includes loans approved by Local Acts of Parliament. They conclude that there was not a consistent relationship between loan values and mortality change and that there is a need for further research 'into the way in which different local authorities used the support they obtained and the different challenges they faced'.[18] Toke S. Aidt *et al.* note that large investments were needed to 'sustain the provision of water', particularly in Birmingham, but suggest that they did not always result in

[15] K. Buse and K. Bayliss, 'England's Privatised Water: Profits over People and Planet', *British Medical Journal*, 23 August 2022 https://www.bmj.com/content/bmj/378/bmj.o2076.full.pdf [accessed 21 May 2023].
[16] G. O'Hara, *The Politics of Water in Post-War Britain (*London, 2017), p. 9.
[17] McTominey, 'Waterworks, Municipal Government and the Environment', p. 14.
[18] B. Harris and A. Hinde, 'Sanitary Investment and the Decline of Urban Mortality in England and Wales, 1817–1914', *The History of the Family,* 24, 2 (2019), pp. 339-376, p. 369.

improvements in quality. Their analysis suggests that greater attention should be paid to the sequencing of sanitary interventions and their interactions.[19]

In the histories of Birmingham, the act of municipalisation of the waterworks is much celebrated as an important civic achievement, and yet there is very little historiography about the early years of municipal control before the Elan Valley Scheme. Similarly, beyond the early twentieth-century council histories that document the Elan Valley Scheme, there are scant historical studies, which is surprising considering the ambitious scale of the scheme.[20] Hence, this chapter will fill the gap in the history of the city. The chapter begins with the waterworks under its new municipal administration from 1876 and explores early challenges and continued ratepayer resistance. It then looks at the new supply and examines more closely the development and construction of the Elan Valley Scheme, including the economic aspects. Finally, it considers the private versus public ownership debates past and present.

New Municipal Administration

This section establishes the nature of local sources of water supply and how the council addressed issues of quantity and quality. It identifies some early challenges

[19] T. S. Aidt, R. J. Davenport and F. Gray, 'New Perspectives on the Contribution of Sanitary Investments to Mortality Decline in English Cities, 1845–1909', *The Economic History Review,* 76, 2 (2023), pp. 624-660, p. 657.
[20] The most extensive details about the Elan Valley scheme are contained in C. A. Vince, *History of* the *Corporation of Birmingham, Vol. III* (Birmingham, 1902), pp. 326-339; C. A. Vince, *History of the Corporation of Birmingham*, *Vol. IV* (Birmingham, 1923), pp. 435-457. There is also brief mention in C. Upton, *A History of Birmingham* (Stroud, 2011), pp. 137-138. and Reinarz, 'Industry and Illness', pp. 254-255.

for the new municipal administration and, due to former resistance, explores whether tensions continued once the supply was in public ownership.

Some towns had multiple waterworks set up either by landowners, private companies or local authorities, but Birmingham had only one company; Appendix 6 offers a chronological record of principal events for that waterworks, under both private and municipal ownership. Comparison with other towns, for example, the spa town of Bath, demonstrates how the socio-economic makeup of a town could shape the development of water supply. Birmingham and Bath were similar in that there was an abundance of springs, but in Bath, the number of waterworks grew in tandem with the construction of fine houses for the elite. Surviving rate books from the eighteenth century give information on areas of supply and there could be a single water supply that served just twenty properties.[21] In contrast, Birmingham was a growing economic centre where the working classes moved into hastily-built back-to-back housing. As neither the landlords nor tenants wanted to pay water rates and the water table was easily reached, shallow wells were the local preference. This was the root cause of resistance to an organised supply in Birmingham and may also explain why Birmingham Waterworks Company sought to supply other districts from the start. Hence in 1876, when the area of supply was transferred from the private company into municipal ownership, Birmingham council was responsible not only for the supply for the borough but also for other districts under different authorities (see Fig. 5. 1).[22]

[21] J. Welbank of Wessex Water, '250 Years of Bath Water Supply', Lunchtime Lecture Series (2) available via *Building a Healthier City* (Bath and North east Somerset Council, 2021) https://www.batharchives.co.uk/building-healthier-city-funded-wellcome-trust [accessed 21 November 2020]. Bath was unusual in having a piped supply to the city centre from the Middle Ages.

[22] This situation changes as Birmingham's boundaries change, as detailed in Chapter 3, particularly after 1911 and the Greater Birmingham Act.

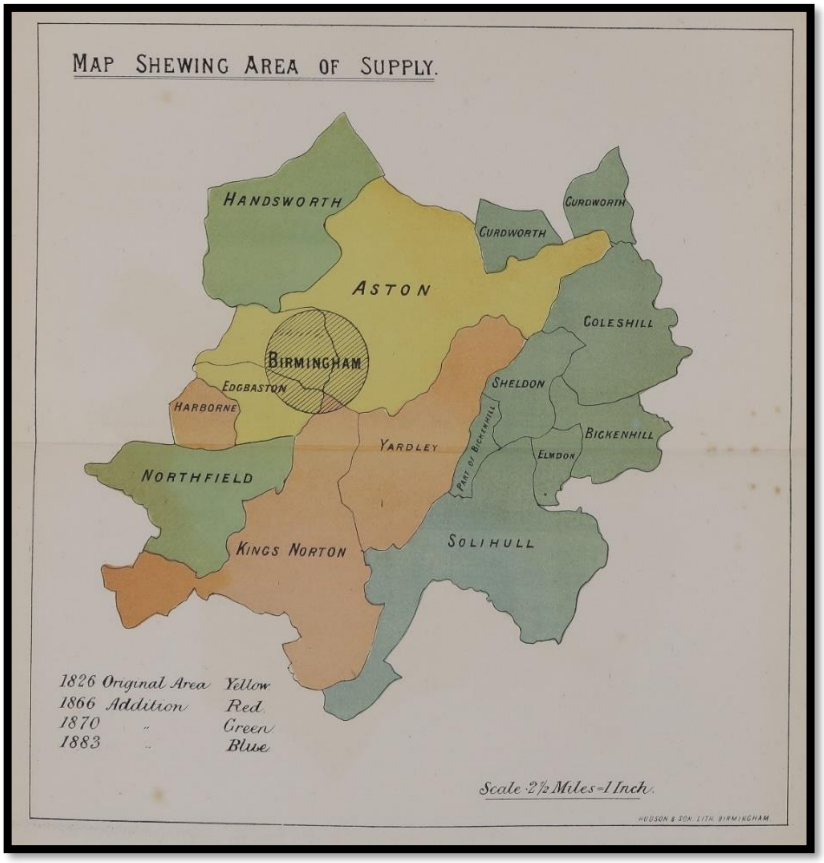


Figure 5.1: Area of Supply: Birmingham and Surrounding Districts

Taken from C. E. Matthews, *The Water Supply of Birmingham: A Paper Read before the British Association for the Advancement of Science* (Birmingham, 1886), rL343.B6. Cadbury Research Library Special Collections.

Once the waterworks came under council control, very little changed operationally. This is understandable because, although some councillors were businessmen and legal or medical professionals, most lacked technological or engineering knowledge and had no former experience of running a waterworks company.[23] The council desired a smooth transfer so it kept all existing company staff, with Thomas Starkey (secretary) and John William Gray (chief engineer) retained in their positions for the

[23] R. Millward and F. Bell, 'Choices for Town Councillors in Nineteenth-Century Britain: Investment in Public Health and its Impact on Mortality' in S. Sheard and H. Power, *Body and City: Histories of Urban Public Health* (Aldershot, 2000), pp. 143-165, p. 144.

day-to-day running of operations.[24] Administratively, the council formed a new committee with Thomas Avery as the Water Committee's first chairman (1876-1887).[25] There were several subcommittees, including Works and Finance but also a particularly busy Law section, headed by Thomas Martineau due to his legal expertise.[26] This dedicated section was needed because of the volume of litigation. In addition to pursuing unpaid water rents, the council was involved in disputes over river pollution and protection of sources of supply (Chapter Four). Also, numerous claims were made to the council for damage from burst pipes and the flooding of properties and consequent interruption of business.[27]

Since 1831 and the first small reservoir at Aston, the company's infrastructure had expanded to meet growing demand as more homes and businesses joined the network. The total extent of the local sources of supply (as at 1875) is detailed in Appendix 7 and Figure 5.2 shows the locations of the reservoirs and deep wells. At the point of municipalisation, the private company had plans to increase capacity at Selly Oak and Shustoke and the council followed through with these. A decade later, Avery reported an improved supply at a cost of between £250,000 and £300,000. The improvements included an extra 124 miles of distribution mains; construction of

[24] Thomas Starkey remained Secretary until 1893 and John William Gray stayed as engineer until his death in 1894. See Appendix 1: Index of Persons (Engineers), for more on Gray.
[25] Subsequent chairs were Thomas Martineau (1887-1893), Edward Lawley Parker (1893-1908) and Charles Gabriel Beale (1908-1912); see Appendix 1: Index of Persons (Councillors and Aldermen) for about Martineau and Lawley Parker.
[26] For biographical entry, see A. Rowley, 'Martineau, Sir Thomas (1828-1893), *Oxford Dictionary National Biography (ODNB)* http://doi.org/10.1093/ref:odnb/49348 [accessed 17 June 2020].
[27] BAC, MS 944/233, Law Sub-Committee Minutes dates beginning on 3 March 1880 - 11 January 1884.

a cover for the Monument Road reservoir; completion of the Selly Oak deep well; and additional work on the filter bed and pumping station.[28]

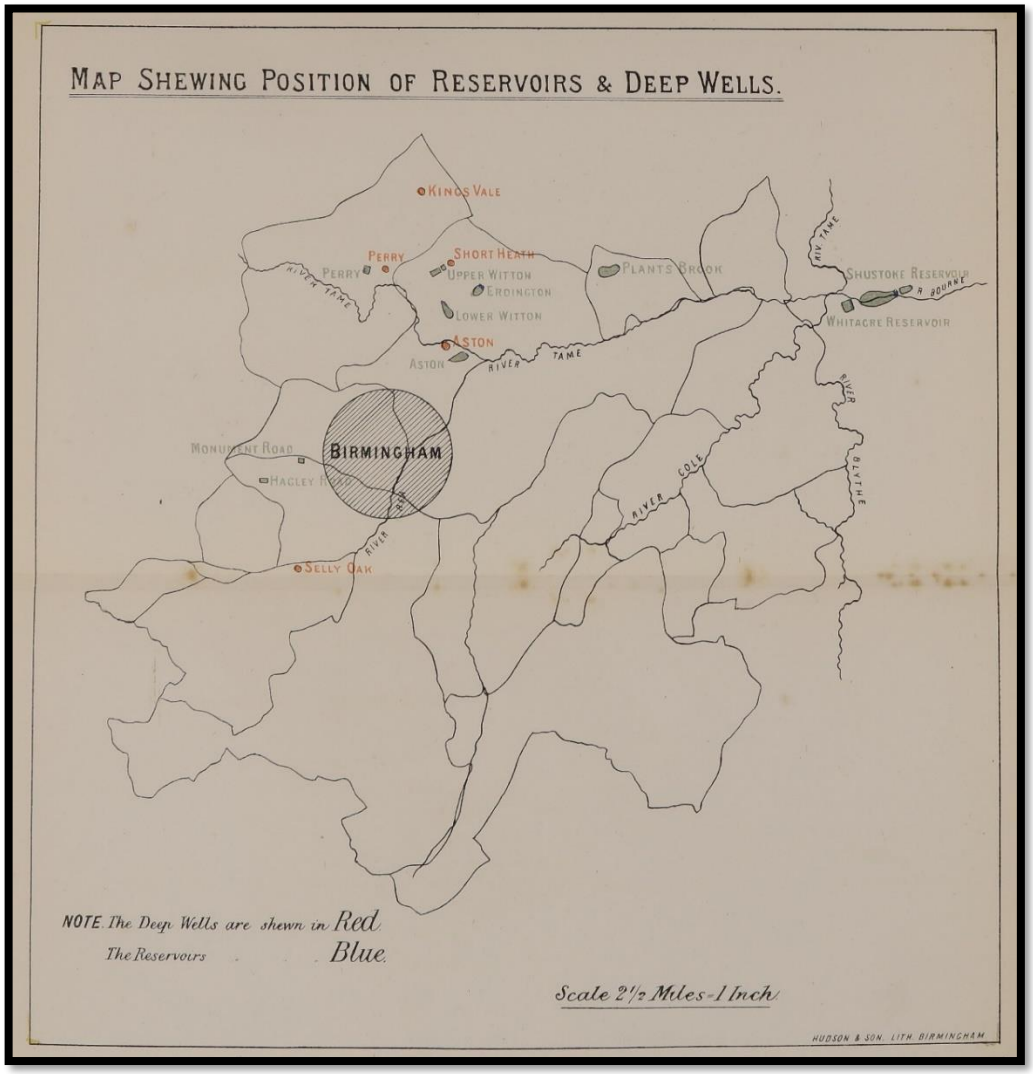


Figure 5.2: Map of Waterworks Deep Wells (in red) and Reservoirs (in blue).

Taken from C. E. Matthews, *The Water Supply of Birmingham: A Paper Read before the British Association for the Advancement of Science* (Birmingham, 1886). Cadbury Research Library Special Collections.

However, the planned reservoir construction at Shustoke was postponed for a few years because new mains were the priority to ensure a better supply, motivated by

[28] BAC, L45.3/209870,*The Birmingham Water Undertaking: Speech of the Mayor of Birmingham (Mr Alderman Avery, J.P.) at the quarterly meeting of the council held on 1 August 1882 (*Birmingham, 1882), pp. 4-5.

the changed priority to the supply for firefighting (see Chapter Three). However, rising demand by 1881 meant that construction could be delayed no longer and Shustoke was operational by July 1883 (Fig. 5.2).[29] By 1902, even though construction at Elan Valley was taking place, there were further local extensions and improvements to meet demand until the new supply came online.[30]

Year	Est. population supplied	No. of Houses Supplied	Average Gross Consumption per head per day (gallons)	Daily average distribution (million gallons)
1859				3.40
1870				7.00
1876				8.30
1895	649,150	131,087	24.60	15.97
1900	668,214	150,794	24.56	18.24
1905	758,637	170,160	24.03	18.23
1910	825,566	184,985	24.00	19.81

Table 5.1: The Growth of Supply and Distribution from Birmingham Waterworks.[31]

As Table 5.1 demonstrates, after twenty years under municipal control the daily distribution had doubled, showing that the council had been successful in addressing issues of quantity. However, as discussed further in the next section, maintaining a constant supply was a struggle. With the sinking of extra deep wells and covering of reservoirs the council also attempted to address issues of quality, although the litigation against the surrounding authorities suggests that problems continued as there was a constant battle to protect the surface sources used to fill supply

[29] J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885), pp. 417, 430, 437.
[30] BAC, Severn Trent Collection, MS 944A/134, Notebook on Birmingham Waterworks c. 1900-1915; Vince, *History of the Corporation III*, p. 291.
[31] Information taken from *History of the City of Birmingham Water Department*, p. 24.

reservoirs. Overall, the council followed in the company's footsteps in terms of plans to expand the infrastructure. The significant difference was that there were no dividend payouts to shareholders on any profits, which in theory should have allowed the council to follow its intended strategy and begin to reduce water rates. However, municipal control of the town's waterworks brought additional challenges and further tensions with the city's ratepayers and landlords.

Early Challenges and Resistance

The Water Committee minute books offer insights into the priorities and concerns of a municipal waterworks.[32] From the start in 1876, requests came for free water, mainly from other council committees who argued that, as the council now owned the waterworks, they should not have to pay. There were also requests from charitable organisations such as the Society for the Protection of Animals for the £3 annual fee for eight troughs around the town to be waived. They argued that the troughs also benefited council horses: the committee was sympathetic, and the fee was waived. The committee also reduced the water rate for cab shelters to £1 per annum.[33]

Maintaining a constant water supply for consumers was at times difficult because of winter frosts and summertime droughts.[34] Burst or faulty pipes and diminished sources of supply generated claims for compensation and complaints about lack of service as consumers of a chargeable service wanted what they were paying for. Difficult periods were 'the Great Frost' of 1894/5 and the dry summer of 1896.[35] A

[32] BAC, Birmingham City Council Water Committee records now form part of the Severn Trent Collection, MS 944 and MS 944/A.
[33] BAC, MS 944/3, Water Committee Minutes, 5 May 1876.
[34] V. Taylor and F. Trentmann, 'Liquid Politics: Water and the Politics of Everyday Life in the Modern City', *Past and Present*, 211 (2011), pp. 210-241, p. 205.
[35] Bunce, *History of the Corporation II*, p. 426; Vince, *History of the Corporation III*, pp. 327, 329.

contemporary cartoon (Fig. 5.3) illustrates the water department's financial difficulties through claims for damage from burst pipes and demands for refunds due to interrupted service.[36] This explains why a policy of waste reduction was vital to try and sustain a constant supply and meet the extra demand brought by new connections. To achieve this the council brought in a new insurance scheme for water fittings in 1882. However, this caused tension with plumbers in the city who were resistant to the notion of being 'authorised' by the water department, but the scheme did eventually pass.[37] A 'house-to-house' inspection scheme was also implemented to check the state of water fittings; this conveniently proved useful for identifying who was using a supply without paying.[38]

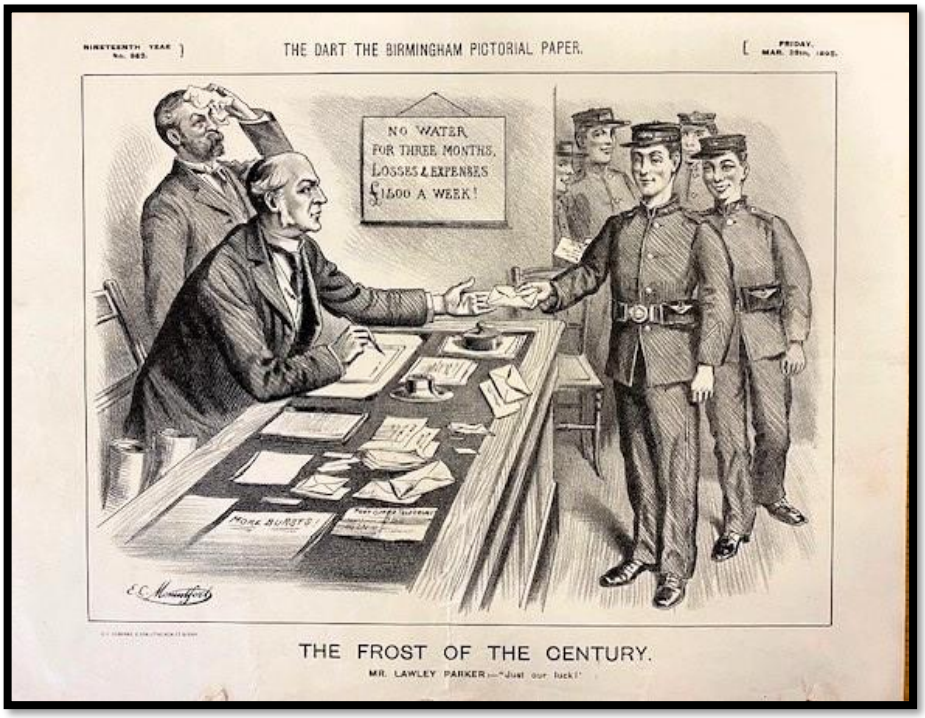


Figure 5.3: Cartoon by E. C. Mountford, 'The Frost of the Century', *The Dart*, 28 March 1895.
Reproduced with permission of Library of Birmingham.

[36] Vince, *History of the Corporation III*, pp. 328-330.
[37] Bunce, *History of the Corporation II*, pp. 430-433.
[38] Bunce, *History of the Corporation II*, p. 431.

One of the main suggested benefits for bringing the waterworks under public control was to improve public health by closing polluted wells and extending the piped supply to all citizens. Eight years after delivering his paper to the Social Science Congress, Medical Officer of Health (MOH), Dr Alfred Hill, finally started issuing notices to close wells. Between 1876 and 1884 over 3,000 wells were closed with a communal tap replacing the pump and well in the courtyard.[39] The wells were identified by water analysis and reported to the Health Committee, which had the power to issue a fourteen-day notice to close the well and order the landlord to source an alternative supply. Landlords had little choice but to connect to the piped supply and incur the dreaded water rates. Although the landlords' influence within the council had diminished, they still made direct appeals by deputation to the Health Committee against notices which were often extended to one month for landlords to secure their own water analysis and investigate whether it was an isolated incident.[40]

Some individuals saw this as an infringement of their rights as property owners, and were prepared to resist through the courts. In 1888 Hill told a meeting of the Society of Public Analysts how a point of law had been used to contest the closing of wells.[41] In this particular Birmingham case Hill's notice to close was refused upon appeal because the magistrate considered that the grounds for 'injurious to health' had not been proved. The well-owner was present in court apparently in good health and stated that he drank water from the well every day, so how could it be classified as

[39] Bunce, *History of the Corporation II*, pp. 104-106; Reinarz, 'Industry and Illness', p. 254. The closing of polluted wells is discussed further in Chapter Six.
[40] Cadbury Research Library, Special Collections, University of Birmingham (CRLSC), r PN4162, *Birmingham Landlords' and Ratepayers' Mutual Protection Association Annual Report* (Birmingham, 1877).
[41] A. Hill, 'Proceedings of the Society of Public Analysts. Polluted Drinking Water and the Closure of Wells', *The Analyst* (August 1888), pp. 141-149.

injurious? Hill was placed on the spot by the magistrate and asked to testify that drinking a pint from it at that time would be dangerous to the life of the well-owner. Naturally, Hill could not swear to that but insisted that the water was dangerous to drink and that on one day it might prove harmful. The magistrate was not convinced and dismissed the case. Consequently, the societies of Medical Officers for Health and Public Analysts were concerned that this precedent might hamper future attempts to close polluted wells – a state of affairs that raised questions about how much power actually resided with Urban and Rural Sanitary Authorities.[42]

There were also internal challenges which threatened Avery's strategy to invest to improve the supply and quality of water and reduce water rates for the customer.[43] Rate reductions started from 1880, although not for all bands, but in 1883 Alderman Lloyd put forward a motion on behalf of the ratepayers. He proposed that the Water Committee, with its increased income, should contribute to reducing the Borough Rate so that ratepayers in addition to consumers might benefit from the publicly owned waterworks. The motion was passed and £6,500 was added to the Borough Fund. This was a major upset for Avery who was set to resign, bitterly disappointed that some members of the Water Committee had voted in favour of this motion. However, Avery remained in post, and this allocation of profits happened only once. Shortly after there was another resolution that the *future* allocation of profits – and not the Borough Fund – would be used for supply improvement and occasional rent reductions.[44] This suggests that, despite a majority vote for rate relief, Avery's skills and commitment to water and the sewage works were considered valuable, and that

[42] Hill, 'Polluted Drinking Water and the Closure of Wells', pp. 141-149. There was a similar case in Enfield.
[43] Bunce, *History of the Corporation II*, p. 435.
[44] Bunce, *History of the Corporation II*, pp. 434-437.

this backtracking of policy was done to appease him and stop him resigning. Water rents were reduced again in 1883 and 1884 but by 1887 there were further disagreements over rent reductions and the purpose of the reserve fund of £50,000. Avery insisted that the reserve was insurance for the purpose of emergencies against bursts or other accidents, whereas other committee members considered that the fund was for 'equalising revenue'. The council histories report that the water rent reductions of 1883 and 1884 were 'apparently' miscalculated, resulting in losses on the revenue account. Avery managed to resist any accumulated losses in revenue being taken from the reserve fund, but he resigned as chair of the Water Committee later that year.[45] This suggests that the discord within the committee may have pushed Avery to relinquish control and it is not clear in the council histories what happened to the reserve fund after Avery's departure. However, it would have been of benefit when the department was plagued by a succession of issues that put the system under immense strain and led to extended periods of breakdown of supply between 1893 and 1896, through extremes of drought and frost and burst mains.

In addition to all these challenges, the Law subcommittee was kept busy with an array of litigation. This was not simply against other authorities, i.e. those who had not joined the joint drainage board, but also against traders who lived and worked along the River Bourne and Plant's Brook. Notices were served to millers, blacksmiths, butchers, and farmers to restrain and make alternative arrangements for their sewage and trade waste.[46] The actions were time-consuming and expensive, and in some cases took years to resolve as smaller local authorities struggled to

[45] Bunce, *History of the Corporation II*, pp. 434-437.
[46] BAC, MS 944/233, Law Sub-Committee Minute Book, 3 March 1880-11 January 1884.

meet the sanitary obligations of new legislation. Other legal challenges were made to the council's calculation of water rate assessment and one such case was brought by Birmingham landlord W. B. Smith.

The Case of W. B. Smith

Vanessa Taylor and Frank Trentmann argue that 'the politics of property, taxation and municipal reform' were played out over water rate assessment.[47] They refer to the case of Archibald Dobbs who in 1881 took on the Grand Junction Waterworks Company, a private company which served the west of London, over water rate assessment. The case was made on the lack of clarity in legislation about whether customers should be assessed on 'net' or 'gross' annual property value. Dobbs' case fuelled widespread interest – after being unsuccessful initially, it was won on appeal. However, that verdict itself was then repealed, before the House of Lords finally found in Dobbs' favour. Taylor and Trentmann suggest that this prompted the formation of a consumer defence league, specifically about water, that organised to test companies over the issue.[48] Many cases were directed at private water companies, but some challenged municipal supplies, including Birmingham. However, the first mention of such a legal case in Birmingham's council records dates from 1880, apparently before the Dobbs case, suggesting that the consumer defence league campaign may have started earlier than previously thought. Regardless of which came first, the Dobbs case generated far greater publicity in London due to the

[47] Taylor and Trentmann, 'Liquid Politics', p. 206.
[48] Taylor and Trentmann, 'Liquid Politics'; Higham, *The Mercenary River,* pp. 310-311.

number of private water companies, and thus affected the time scale for the outcome of the Birmingham case, as everyone waited for the final ruling in the Dobbs case.[49]

W. B. Smith was the owner of forty weekly rented houses in Birmingham. His argument was that all his properties should be let at a gross rental of £520, out of which he paid £29 a year for the water rate. He explained that out of that £520 he paid £15 16s 1d for the borough rate, £26 1s for the poor rate in March and September and £40 for repairs and voids, leaving a total revenue of £380. Smith considered the system of rating unfair, believing he should be assessed on the total revenue figure and not the gross rental and therefore challenged the council and Water Committee.[50] The case was not resolved completely until 1884, and in contrast to the Dobbs case, it found in the council's favour on all points raised by Smith, except on the matter of voids. It was recommended that such an allowance be made, and it was ruled that each side was to pay their own costs.[51] It is likely that Smith was supported by the Birmingham Landlords' and Ratepayers' Mutual Protection Association, making this a test case on behalf of the city's landlords. This case is an example of continued resistance, and evidence of the growing resentment among Birmingham's landlords and ratepayers at the raft of municipal policy for improvements and reform to meet public health obligations. The landlords' believed that they were paying for improvements that were being forced upon them. The new privy scheme (Chapter Six) was one extra expense to landlords concurrently with the extra rate for Chamberlain's Improvement Scheme which incurred extra costs at a

[49] Bunce, *History of the Corporation II,* p. 432.
[50] BAC, MS 944/233, Law Sub-Committee Minutes, March 1880-January 1884, from a newspaper cutting stuck into the minute book.
[51] For details of this case, see Bunce, *History of the Corporation II,* pp. 424-438.

time of economic downturn. Birmingham's satirical magazines made much of the council 'Putting on the Screw', squeezing more money out of ratepayers.[52] The resolution of the Smith case perhaps allowed each side to claim a victory of sorts.

The first twenty years of municipal control were challenging. Avery had been the driving force for the first decade, and was succeeded by Martineau, who incidentally had voted for the borough rate relief in 1883 and was in favour of using money from the reserve fund to balance the books.[53] It was under Martineau that the department moved forward to meet the challenge of securing Birmingham's future supply and answering issues of quality and quantity.

A New Supply

Roberts suggests that the 'provincial municipalities of Britain' led the way in how to supply water to their citizens.[54] Water projects in Britain after the mid-nineteenth century were on a large scale. For example, Liverpool's Vyrnwy dam in Wales, built in 1880s, was at that time the largest masonry dam in the world. Manchester, Glasgow and Leeds also undertook schemes to capture rural watersheds and Birmingham joined its fellow municipalities in delivering one of the most ambitious civil engineering projects of its time (Fig. 5.4).[55] This section examines the motivations for the scheme and looks at the financing of the project.

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[52] *The Dart,* 21 April 1884. Cartoon by E. C. Mountford depicted Chamberlain squeezing more money (£100,000) from Birmingham's ratepayers. The screw is significant because of Chamberlain's business background with Nettlefold and Chamberlain screw-makers; see S. Roberts and R. Ward, *Mocking Men of Power: Comic Art in Birmingham 1681-1911* (Birmingham, 2014), pp. 56-57.
[53] Vince, *History of the Corporation III*, pp. 293-294.
[54] Roberts, 'The Politics of Health', p. 308.
[55] Coopey, 'Politics, Imperialism and Engineering', pp. 375-376.



Figure 5.4: The Pen-y-Garreg Dam.
One of the dams on the River Elan when water levels were deliberately low for essential work on one of the other dams. A good opportunity to show the stone construction. Photo: Author's own taken in August 2022. [56]

Richard Coopey suggests that the control of water resources reflected 'the consolidation of civic authority'.[57] Joseph Chamberlain said as much in his 1874 speech to the council, but also pointed out that having control over the future provision of water for the town was another good reason to purchase the undertaking.[58] When the waterworks was still in private hands, the council had explored alternative sources of water supply between 1870 and 1871: civil engineers

[56] The dams were built of cyclopean rubble with rock-faced block-in-course masonry. The rubble was set in Portland cement concrete. The cement used was brought from the River Thames by barge to Aberdovey and it was specified that all sand and every brick had to be washed before it was put in place; see R. Morton, *The Building of the Elan Valley Dam*s (Walsall, 1997), p. 79.
[57] Coopey, 'Politics, Imperialism and Engineering', p. 376.
[58] CRLSC, L49.11, *A Short History of the Passing of the Birmingham Corporation Gas Act and Water Acts 1875* (Birmingham, 1875), p. 53.

Richard Hassard and Robert Rawlinson both suggested that the council should look to mid-Wales for gathering grounds and Rawlinson suggested that water could be gathered from the Rivers Elan and Claerwen (see Appendix 6). The schemes were considered too expensive at that time (the council had not yet started municipal trading with gas) but this idea was returned to twenty years later.[59] This demonstrates the growing power, both politically and financially, of the modernising municipal impetus in Birmingham.

John Hassan suggests that water was 'historically, the first urban problem'. It was a life necessity, a means to extinguish fire, used as a power source, and utilised for industry, transport and sanitation.[60] Despite the best efforts of chief engineer John Gray and the Water Committee, increasingly the local supply struggled to meet the extra demands of population and industry growth. Gray was tasked in 1890 to report on the situation and concluded that in twenty-five years the demand would be 11 million gallons more and in fifty years it would be 38 million gallons more. Consulting civil engineer, James Mansergh, in co-operation with Gray, explored possible solutions locally and further afield.[61] The conclusion of the engineers was that an extension of the local supply would not meet the future needs of the city. The deep wells were not consistently delivering the quantities expected, and to support their argument they looked to Paris's experience with wells and springs and considered London's difficulties a 'warning'.[62] Their conclusion was to acquire land in Wales at

[59] Bunce, *History of the Corporation II*, pp. 405-406; City of Birmingham Water Department, *History of the Birmingham Water Department* (Birmingham, 1974), pp. 7-8. James Mansergh was involved in the original survey conducted by Rawlinson in 1871.
[60] J. A. Hassan, 'The Growth and Impact of the British Water Industry in the Nineteenth Century', *The Economic History Review,* 33, 4 (1985), pp. 531-547, p. 531.
[61] See 'Obituary. James Mansergh, FRS, 1834-1905' available at https://www.icevirtuallibrary.com/doi/pdf/10.1680/imotp.1905.17068 [accessed 6 June 2023].
[62] CRLSC*,* TD264.B5 B, T. Barclay, *The Future Water Supply of Birmingham* (Birmingham, 1898), pp. 12-13.

the sites suggested earlier in the Elan Valley.[63] The case for the ambitious project was to secure an ample supply for at least fifty years, factoring in an increased demand of three per cent per annum.[64] However, specific types of demand were not specified and, conspicuous by its absence in promotion of the scheme, was a promise to make Birmingham a water closet town. The reasons for this have already been partly explored but will become clearer in the following chapter.

The scheme passed the town meeting stage without issue, mainly because some financial promises were made (discussed later). Thereafter, it was subject to considerable opposition as a Bill progressed through Parliament. There were objections within Birmingham from some ratepayers and business owners who argued that the cost was too high. There was also opposition from people in the locality of the proposed works. London and South Wales local authorities also objected because they were concerned that Birmingham was claiming a watershed that might be needed by them in the future.[65] Chamberlain, as one of the MPs for Birmingham, was tasked with promoting the Bill, but at that time, he was the major opponent of William Gladstone's Irish Home Rule Bill; consequently, there was a risk that Irish MPs might vote against Birmingham's Bill.[66] The Bill was subject to delay and several parliamentary readings before it was finally given Royal Assent in June 1892. The Act authorised the construction of three dams and reservoirs on the Elan and three on the Claerwen; an aqueduct over seventy-three miles long (see Fig. 5.5

[63] See Barclay, *Future Water Supply* for full details of the proposed schemes and some of the local objections raised.
[64] Barclay, *Future Water Supply*, p. 51.
[65] Lewis Brown offers a detailed overview of the opposition to the Bill in *The Elan Valley Clearance*, pp. 22-38.
[66] C. Upton, 'From Paper to Pipes: Public Health, Clean water and the Elan valley Scheme, 1892-1905', *History West Midlands*, 2, 2 (2014), p. 34.

and Appendix 8 for a plan of the route); a storage reservoir, filtration works and a pumping station at Frankley in Birmingham; and trunk mains for the distribution of the water.



Figure 5.5: A Section of the Aqueduct Near Ludlow.

Taken from E. A. Lees, *City of Birmingham Water Department, Elan Supply* (Birmingham, 1908), Plate 7, rTD264.B5. Cadbury Reserach Library Special Collections.

The design and route of the aqueduct was to deliver water by gravitation, estimated to save £20,000 per annum in pumping costs, and this was an integral part of the financial plan to fund the scheme.[67] However, for the Act to pass, amendments were required to answer concerns from the counties through which the aqueduct passed and to clarify rights for tenant farmer leases, turf cutting, sheep washing, removal of bodies from graveyards and the provision of drinking places for cattle.[68] Once the Act

[67] Barclay, *Future Water Supply*, pp. 38-39.
[68] Lewis Brown, pp. 22-38.

passed, land was purchased and plans were put in place for construction. The work was proposed in phases, with the first for the three reservoirs on the River Elan and two pipelines in the aqueduct. In total, six pipelines were proposed for the entire scheme to meet future demand.[69]

Building the Dams

Mansergh, the consulting engineer, oversaw the whole scheme in Wales (with Gray responsible for the works at Frankley, until the latter retired in 1894). The engineer in charge of building the dams was George Yourdi, an expert in concrete. Another engineer, Eustace Tickell, was originally sent with Mansergh's two sons to survey the area and was subsequently appointed engineer in charge of the Pen-y-Garreg Dam. The engineers lived on site in some of the houses vacated in land sales.[70]

The project required the purchase of land, the building of a railway, installations of large-scale machinery and a substantial workforce of manual labourers. Mansergh suggested that the council should employ its own workers for the construction of the dams and reservoirs, and contract out other parts, necessitating the building of a workers' village.[71] Rita Morton, a former employee of Severn Trent Water, produced a history of the building of the dams, focusing on Elan Village in 1890s and offering an insight into to the lives of workers during the construction. The village was built on land belonging to Birmingham council with the only entrance being a wire suspension

[69] *History of Birmingham Water Department*, p. 8.
[70] Morton, pp. 7, 61-66. See also 'Elan Valley Dams: George Yourdi', *Powys Digital History Project* (n.d.) http://history.powys.org.uk/history/rhayader/yourdi.html [accessed 28 December 2023]; 'Elan Valley Dams: Eustace Tickell - Engineer and Artist', *Powys Digital History Project* (n.d.) http://history.powys.org.uk/history/rhayader/tickell.html [accessed 28 December 2023].
[71] Lewis Brown, pp. 41-59.

bridge which was built in February 1895. The village was self-contained with its own utilities; the buildings were made of wood and included a public school, mission room, canteen, hospital, bath house, post office and police station. A working community grew as the village was home to workers and their families. On the other side of the river, but not in the village, was a working men's lodging house.[72] Although located in mid-Wales, this community was subject to the rules and regulations of Birmingham's local government.[73] Newspaper sources suggest that navvies and labourers working for Birmingham council in 1899 received a wage of 5d. per hour for a 52-and-a-half-hour week plus lodgings in Elan Village.[74] By 1901 the population of the area had increased to 2,143 (from 333 in 1891/2), with 1,300 living in the village, including workers from around the globe.[75]

As Lewis Brown emphasises, local residents must have been 'overwhelmed' by the change to the valley. Due to nature of the project, there were work-related deaths and injuries, including the death of an eleven-year-old boy killed while cleaning a steam crane, alongside natural deaths, a suicide and even a murder.[76] There were also outbreaks of typhoid in 1896 and smallpox in 1903 and a dedicated isolation ward was created in the village.[77] After the first phase of construction ended, the temporary village was dismantled and gave way to permanent stone-built houses for the workers employed by Birmingham council for the maintenance of the dams,

[72] Morton, pp. 11, 30.
[73] *Birmingham Daily Mail*, 21 July 1904
[74] *Woodbridge Reporter*, 24 August 1899.
[75] Morton, pp. 11, 30; workers came from the nations of the United Kingdom, Ireland, Guernsey, Jersey, America, Australia, New Zealand, South Africa, Belgium, Italy and Denmark; see Lewis Brown, p. 59. The *Birmingham Daily Gazette*, 12 July 1904 reported 'a municipal army' of over 2000 workmen, between 30 and 40 clerical staff plus an engineering staff of 20. It also revealed that Mansergh had his own home in Rhayader.
[76] Morton, p. 43; Lewis Brown, pp. 59, 64.
[77] Morton, p. 37.

reservoirs and filter beds, and these remain today.[78] The new water supply was officially opened by King Edward VII and Queen Alexandra on 21 July 1904 with the turning on of the water at Elan Valley waterworks, with a specially made ceremonial wheel starting the water's journey to Birmingham via the aqueduct (Fig. 5.6).[79]

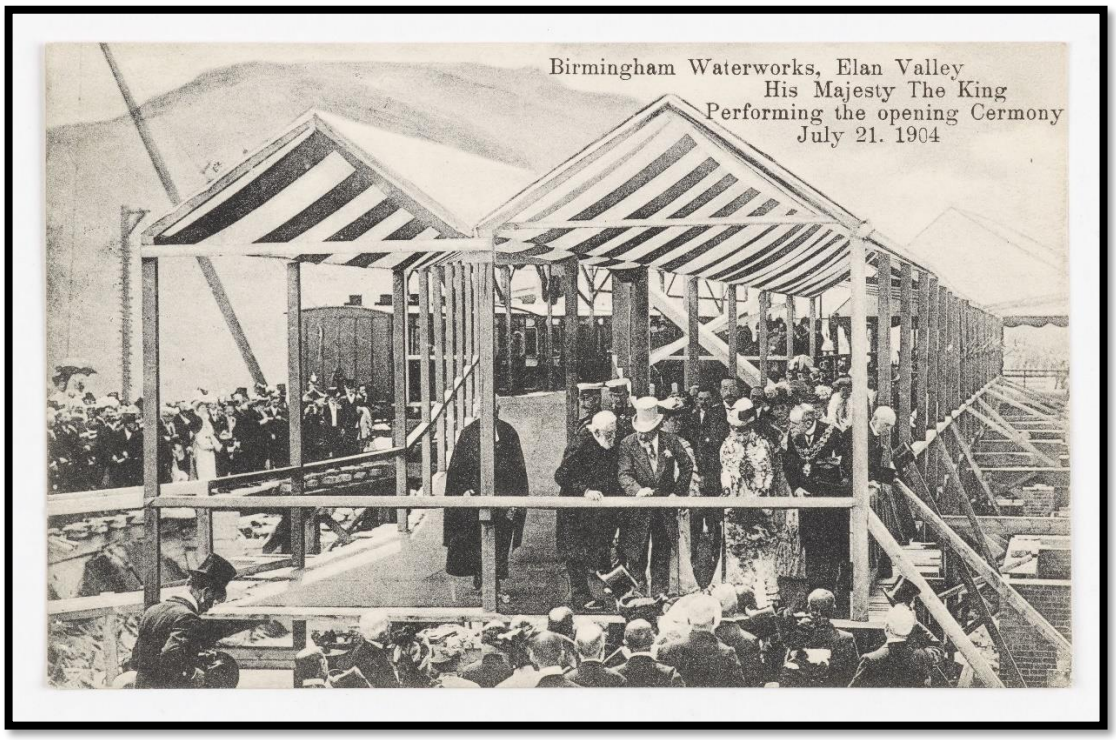


Figure 5.6: King Edward VII and Queen Alexandra Perform the Opening Ceremony for the Waterworks.
Photo of postcard by Birmingham Museums Trust, licensed under CC0.

Roberts has examined the ceremonial and commemorative culture surrounding new waterworks for municipalities in England and noted that the knighting of Birmingham's mayor, Hallewell Rogers, during the ceremony was a 'symbolic royal blessing' of the project and an acknowledgement that Birmingham's council had

[78] Lewis Brown, p. 67. The permanent Elan Village was completed in 1909.
[79] Morton, p. 82; Lewis Brown, p. 67. The water takes two days to reach the reservoir at Frankley in Birmingham.

reached the pinnacle of civic achievement.[80] The first phase of the scheme over twelve years saw the construction of the Craig-Goch, Pen-y-Garreg (Fig. 5.4) and Caban-Coch dams and the aqueduct that passed through the five counties of Radnorshire, Herefordshire, Shropshire, Worcestershire and Staffordshire to the semi-circular Frankley reservoir in Birmingham (Appendix 8 and 5.7).[81]

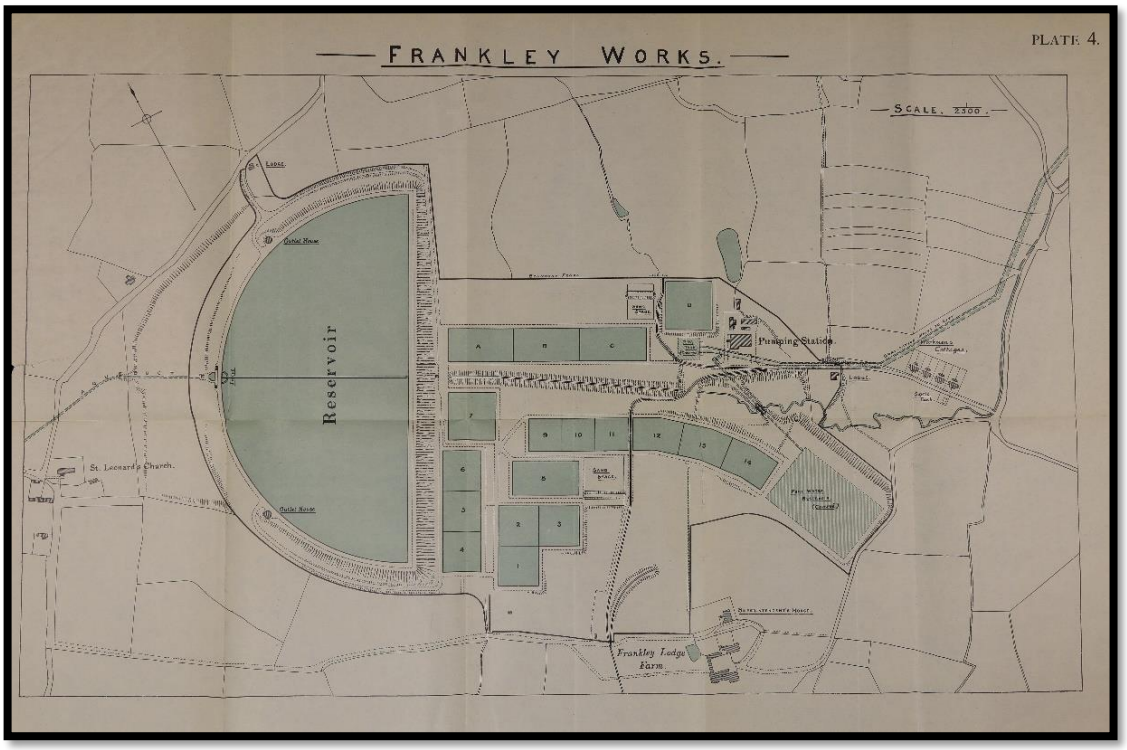


Figure 5.7: Plan of the Works at Frankley in 1908.

Taken from E. A. Lees, *City of Birmingham Water Department, Elan Supply* (Birmingham, 1908), rTD264.B5. Cadbury Research Library Special Collections.

[80] O. G. Roberts, 'Waterworks and Commemoration: Purity, Rurality, and Civic Identity in Britain, 1880-1921', *Continuity and Change,* 22, 2 (2007), pp. 305-325, p. 309.
[81] Morton, p. 86; Lewis Brown, p. 67.

Mansergh was paid for his services, but sadly he did not live to see the second phase of his plan because he died in 1905.[82] In 1903 he was given the freedom of the borough of Lancaster, his birthplace, in recognition of his services to 360 municipalities and the production of over 300 reports on a variety of engineering projects.[83] Mansergh's original plans for three separate dams on the River Claerwen never materialised, being instead replaced by the huge Claerwen Dam which opened in 1952.[84]

In contrast to the Chamberlain Memorial Fountain as a symbol of municipalisation of the water supply, the Elan Valley scheme was memorialised in Birmingham by a small-scale 1960s model of the Elan Valley dams and reservoirs installed in Birmingham's main park at Cannon Hill. It remains today, a diminished symbol of the peak of Birmingham's civic achievement.[85] From 1974, the responsibility for local water supply passed from the council to the Severn Trent authority.[86] Although the project has faded from local memory, it was inspirational at the time. The author Francis Brett Young witnessed the construction of the dams as a child and incorporated the building of the dams in *The House Under the Water* (1931), one of his Mercian novels.[87] However, it was not until the centenary in 2004 that a

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[82] The Special Supplement in the *Birmingham Daily Post*, 22 July 1904 reported that Mansergh's commission was 3.5% on expenditure up to a maximum of £2,417,693.00. A similar arrangement was reached for when he took over the Frankley part of the project after the retirement of Gray. It was suggested that these details had been undisclosed at first due to the terms being considerably lower than professional custom with usual commission at 5% (see Vince, *History of the Corporation III*, p. 321).
[83] *Montgomeryshire Echo*, 4 April 1903.
[84] Lewis Brown, p. 70.
[85] For a short film showing the opening of the model dams and reservoirs, see 'Midlands News: 04.05.1962: Elan Valley model of reservoirs' (1962), *The Media Archive for Central England* https://www.macearchive.org/films/midlands-news-04051962-elan-valley-model-reservoirs [accessed 23 May 2023].
[86] For the background to privatisation, see Hassan, *A History of Water*, pp. 162-171.
[87] For more about this novel, see 'Published Works', *Francis Brett Young Society* (2021) https://fby-society.co.uk/the-works-of [accessed 28 December 2023].

permanent memorial to the men who built the dams and reservoirs was installed at the Elan Valley Visitor Centre (Fig. 5.8).[88]



Figure 5.8: *Navvy*, Elan Valley Reservoirs Visitor Centre.
Statue by Debbi Leeton (2004). Author's own photo taken August 2022.

Financing the Scheme

This section examines the economic aspects of the Elan Valley Scheme, critically reviewing the process of sanitary investment and past and present-day debates surrounding private or public ownership of water companies. In 1905, the president of

[88] At the present time some 365 million litres of water (82 million gallons) can be extracted to supply Birmingham. Additionally, 68 million litres a day keep the Rivers Elan and Wye flowing and ensure local supply; information from the *Elan Souvenir Guide* (n.d) produced by Welsh Water.

the British Association of Waterworks Engineers stated that private companies did not have the resources to contemplate works of the scale executed by Manchester, Liverpool and Birmingham municipalities.[89] This was primarily because, during the last decades of the nineteenth century, local government had had the advantage in obtaining loans at more favourable rates over longer periods, thus keeping costs of borrowing down.[90] Over £22 million in loans for sanitary purposes were sanctioned by the Local Government Board between 1872 and 1880, and £66 million between 1880 and 1897. Harris and Hinde show that local Acts were also significant to authorise borrowing.[91]

Borrowing powers for the Elan Valley Scheme were secured under the Birmingham Corporation Water Act 1892. The entire scheme was estimated to cost £6.6 million, which in 2023 equates to approximately £676.4 million.[92] The required capital could be raised by stock or mortgage and be redeemed or paid off after 60 years; crucially, instalments did not begin for 10 years, which was how long it was estimated the first phase would take.[93] It was not anticipated that the capital would have to be borrowed all at once; instead some of the capital would be borrowed much later once extra mains needed to become operational. The Water Committee set up a sinking fund for the annual instalments with interest, similar to Manchester and Liverpool's arrangements. As part of the financial package to meet those repayments, the

[89] Before the Lake Vyrnwy Water Scheme, Liverpool municipality had a bad experience with the unsuccessful Rivington Scheme which added £1.3 million to the municipal debt; see Roberts, 'The Politics of Health', p. 313.
[90] C. H. Priestly (1905) cited in Hassan, *A History of Water in the Modern Period*, p. 19; S. Szreter, *Health and Wealth* (Rochester, 2005), p. 221; S. Homer and Sylla (2005) cited in Harris and Hinde, 'Sanitary Investment and the Decline of Urban Mortality', p. 347.
[91] Hassan, *A History of Water*, p. 19; Harris and Hinde, 'Sanitary Investment and the Decline of Urban Mortality'.
[92] Barclay, *Future Water Supply.* Figure according to Bank of England inflation calculator on 21 May 2023.
[93] Vince, *History of the Corporation III*, p. 317.

ratepayers of Birmingham were informed that the Water Department had arrived at a solution to pay for the scheme without 'the imposition of special rate'. Gray suggested that if a portion of the water rate reductions made in 1881, 1883 and 1884 were 'reimposed', then the predicted extra revenue, in combination with the anticipated saving of £20,000 per annum in pumping costs, would cover the required annual payment for the borrowed capital.[94] The council had considered the potential for ratepayer resistance and attempted to come up with a workable solution that would appease the ratepayers. This explains why the scheme did not meet major resistance at the town meeting stage. One important factor was that the council acknowledged that this scheme benefited people living beyond Birmingham's boundaries at that time; therefore the water supply customers and not just Birmingham's ratepayers would repay the loan. Upon the passing of the Act, the council quickly introduced a new scale of water rates from January 1893.[95]

The original estimate for the first phase of construction was £3,349,700 but the cost of the first phase came in at £5,852,731 due to extra works required and work planned for later which was brought forward.[96] Running over budget obviously upset the precisely calculated financial plan. A special news supplement issued to celebrate the royal opening criticised the scale of the increased costs. It highlighted that the ratepayers of Birmingham, and not the customers from outside the borough, would be left to subsidise the extra costs from the rates at £45,000 per annum; this equated to four pence in the pound on the borough rate, and it was estimated that this would

[94] Barclay, *Future Water Supply*, pp. 43-52.
[95] See Vince, *History of the Corporation III,* pp. 326-327 for full listing of the water rents.
[96] Barclay, pp. 30-37; *History of the City of Birmingham Water Department*, p. 9.

have to be in place for 'about twenty years'.[97] Later, in 1914, other phases of the scheme had to be brought forward as demand increased and extra revenue was again required due to the original overspend. Contrary to the 1891 financial proposal which promised a reduction of water charges by 1918, these were increased once again in 1915.[98] It was not until 1930 that the department became self-funding.[99]

As the scheme was designed to meet water demand for 50 years, future forecasts formed part of the economic picture. Mansergh's 'elaborate forecast of revenue and expenditure' had been based on his water demand calculations.[100] The financial difficulties might suggest that Mansergh's forecasts were wrong, but in 2010 those calculations were critically reviewed, and the analysis found that Mansergh had demonstrated a good understanding of the drivers of demand. The comparison of the 1892 forecast with actual annual average demand up to 1955 was found to be 'remarkably accurate'.[101] Producing a works schedule covering decades was difficult, and some elements of Mansergh's scheme had to be implemented ahead of schedule, and then there were delays that no-one could predict because of the First and Second World Wars.[102] Mansergh had predicted expected water rent income based on the expected increase in population, and the council histories suggest that these were correct.[103] Although, extra revenue was required due to the overspend from the start, the considerable rise that took place in 1915 suggests that there was

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[97] The Special Supplement in *Birmingham Daily Post*, 22 July 1904.
[98] *History of the City of Birmingham Water Department*, pp. 9-10, 25.
[99] *History of the City of Birmingham Water Department*. p. 10.
[100] W. Bradford, J. Bridgeman, and M. Gaterell, 'A Review of the 1892 Water Demand Forecast for Birmingham', *Proceedings of the Institution of Civil Engineers. Engineering History and Heritage,* 163, 1 (2010), pp. 39-49. Mansergh's forecast can be found inside Barclay, *The Future Water Supply of Birmingham* as an inserted supplement.
[101] Bradford, Bridgeman and Gaterell.
[102] *History of the Water Department*, pp. 9-11.
[103] Vince, *History of the Corporation IV,* pp. 449-454.

also a realisation by the council that many domestic customers were receiving an unlimited unmetered supply for a single annual fee. Domestic consumption of water had doubled, due to the increased number of water closets and baths in homes and because rainwater was no longer collected for washing.[104] However, the department was not receiving any extra revenue for that increased consumption. Charles Vince, in his council history, defended the 1915 price hike arguing that standards of living had improved for citizens but 'that improvement was costly and must be paid for'.[105]

The financing of this major civil engineering scheme demonstrates that the extended periods of repayment for loans open to local government were crucial in motivating larger municipalities to pursue large-scale projects, although this was dependent upon the number of potential ratepayers and customers. It also demonstrates that local authorities did not always borrow the entire cost of a project and the value of the loan did not reflect the true cost. This supports the contention, highlighted by Harris and Hinde, that there is a need to know how authorities used the loans for sanitary investment and the challenges they faced.[106] Birmingham's Water Department made precise calculations and projections to determine exactly how much needed to be ring-fenced each year to repay those loans with interest. The complete financial package included a loan, water rate increases and anticipated savings due to the gravitational design of the aqueduct. The prediction that 'no rate in aid will be

[104] Vince, *History of the Corporation IV,* pp. 449-454. As the former local supply was hard water, it had been the usual practice in Birmingham to collect softer rainfall water as this was more suitable for soap. Once soft water from Wales arrived, the practice stopped. Birmingham's hard water was used as one of the arguments against having the new supply, some physicians arguing that soft water with no calcium caused rickets. See Development Education Centre (Birmingham), *Water for a City* (1999), an educational resource written by a group of history teachers in partnership with Severn Trent Water as a case study in local history.
[105] Vince, *History of the Corporation IV*, p. 453.
[106] Harris and Hinde, 'Sanitary Investment and the Decline of Urban Mortality'', p. 369.

necessary' proved false because expenditure went £2 million over budget.[107] In the end the ratepayers of Birmingham had to pay far more than originally promised, and over a longer period, and customers did not see water rates reduce. Despite the difficulties, the scheme was successfully completed – being in public hands, perhaps the most crucial aspect was that the burden was shared by the city's citizens. If the water supply had remained in private hands, then a scheme of such scale would never have been contemplated due to the cost and risk to shareholders who could only rely on revenue from customers. In 1904, the *Birmingham Daily Post* acknowledged this added burden for Birmingham's ratepayers but argued that what was gained was 'an adequate supply of pure water' which 'is an absolute necessity to the community and the lack of it would be a much greater evil'.[108]

Private versus Public: Past and Present

In the last decades of the twentieth century, accused of inefficiency and a lack of investment, the entire 'tired public sector management' gave way to the present-day privatised water industry in England – the last of the natural monopolies.[109] During the writing of this thesis in 2023, the UK's private water companies were facing huge criticism, a fact that helps to illuminate the importance of past experience when exploring the recent history of water supply. In an opinion piece published in the *British Medical Journal* in 2022, Chamberlain's 1874 speech to Birmingham council was used to support the argument for the renationalisation of water utilities in

[107] Barclay, p. 60.
[108] Special Supplement, *Birmingham Daily Post*, 22 July 1904.
[109] P. Inman, 'England's Water System: The Last of the Privatised Monopolies – For Now', *The Guardian*, 9 July 2021, https://www.theguardian.com/business/2021/jul/09/england-water-system-last-privatised-monopolies-for-now-analysis [accessed 17 June 2023].

England and Wales.[110] It is possible that further parallels can be drawn between past and present debates about private or public ownership of water supplies.[111]

The management of water resources is complex. Not only must customers be supplied with water, but wastewater must also be treated and resources managed via conservation, river management and flood control. What Hassan suggested in 1998 remains relevant today:

> water's multiple characteristics create almost unique problems in devising market and regulatory structures to govern the delivery of water services. The search for an acceptable solution to these problems is a central theme running through the history of water since the industrial revolution.[112]

More recently, Nick Higham also highlighted that private ownership of a public utility has a history of controversy.[113] Birmingham's council and its quest to municipalise the supply on the grounds of public health is but one example. Hassan and Simon Szreter point out that the drive to municipalise private water companies in the nineteenth century was not always about public health: it was also designed to benefit commercial interests by serving industry's needs and fight fires.[114] When Chamberlain gave his speech to the council in December 1874, he echoed Royal

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[110] K. Buse and K. Bayliss, 'England's Privatised Water: Profits over People and Planet', *British Medical Journal*, 23 August 2022 https://www.bmj.com/content/bmj/378/bmj.o2076.full.pdf (accessed 21 May 2023).
[111] K. Bayliss and D. Hall, 'Bringing Water into Public Ownership: Costs and Benefits', *University of Greenwich* https://gala.gre.ac.uk/id/eprint/17277/ [accessed 8 June 2023]; S. Hendry, 'Should England Nationalise Water Services?' [Blog] 25 January 2018*, London School of Economics* https://blogs.lse.ac.uk/politicsandpolicy/should-england-nationalise-water-services/ [Accessed 8 June 2023]; 'Fixing Britain's National Water Supply Will be a Marathon', *The Economist*, 23 March 2023 https://www.economist.com/britain/2023/03/30/fixing-britains-national-water-supply-will-be-a-marathon [accessed 8 June 2023].
[112] When Hassan wrote this the water industry in England and Wales had been privatised for almost a decade; see Hassan, *A History of Water.* p. 9.
[113] N. Higham, 'Turning on the Waterworks', *History Today*, 72, 10 (2022).
[114] Hassan (1985) cited in S. Szreter, *Health and Wealth*, pp. 221-222.

Commission conclusions that 'the supply of water to all communities should be in the hands of local representative authorities and not in the hands of the private speculators to whom pecuniary profit must necessarily be the first consideration'.[115] Avery's aims as first chair of the Water Committee were to honour the promises made at the parliamentary hearings in 1875: to expand quantity and quality; to build reserves; and to make water cheaper for the public. Without having to generate profits to pay shareholder dividends, money could be reinvested into a better service at a cheaper price. These were key objectives in the nineteenth-century transition from private to public. Birmingham's experience demonstrated that investment in improving supply led to improvements in standards of living, although rates did not necessarily decrease. However, the vision of the 1989 privatisation model was also to improve efficiency and 'unleash' private investment.[116] In the twenty-first century, the relationship between profits, public benefit and the environment is again at the centre of debate. Many consider that privatisation in the UK has been disastrous for customers and the environment but great for investors.[117] The situation in England and Wales contrasts with elsewhere around the globe where water is largely in public hands, including in Scotland. A modern movement towards 're-municipalising' has been motivated by climate change and stress on the water cycle with more droughts

[115] *A Short History of the Passing of the Birmingham Corporation Gas Act and Water Acts 1875*, p. 53. Avery had made this argument and quoted extensively from the Royal Commission on water supply in his 1869 pamphlet.
[116] D. Helm, 'Time to Pull the Plug on the Water Privatisation Model' [Blog], 12 May 2023, https://dieterhelm.co.uk/regulation-utilities-infrastructure/time-to-pull-the-plug-on-the-water-privatisation-model/ [accessed 10 June 2023].
[117] See the *Chartered Institution of Water and Environmental Management* (n.d.) 'Thirty Years On, what has Water Privatisation Achieved? The Environment asked supporters and opponents how they rated the sell-off's outcomes on the 30th anniversary of the 1989 Water Act, selling it to private water and wastewater firms for £7.6 billion. https://www.ciwem.org/the-environment/how-should-water-and-environmental-management-firms-tap,-retain-and-promote-female-talent#:~:text=The%20economic%20rationale%20offered%20for,greater%20efficiency%20into%20the%20system [accessed 26 May 2023].

and floods, as well as scarcity of resources.[118] Kent Buse and Kate Bayliss point out that in 2010 access to clean drinking water and sanitation was declared a human right by the United Nations General Assembly. They also highlight that in August 2022 the Environment Agency declared drought status in fourteen areas of England,[119] and that during the privatised era no new reservoirs were built.[120]

Whereas nineteenth-century arguments were primarily centred around the quality of water and who could access it, present-day arguments are centred on the investment required to upgrade and improve existing water supply and waste management infrastructure, and how best to regulate the industry, particularly for the discharge of untreated sewage and payment of bonuses to executive officers. Economists have analysed the costs and benefits of private or public ownership and have highlighted financial problems with the 33-year-old privatised model.[121] A House of Lords committee report in March 2023 criticised the regulator Ofwat for failure to ensure that water companies invest sufficiently in infrastructure, choosing instead to keep bills low. It also criticised the private water companies for focusing on financial returns 'at the expense of the environment, operational performance, and financial sustainability'.[122] Water UK, the body that represents the water industry, issued an

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[118] 'Turning the tide of water privatization – the rise of the new municipal movement', [Blog] posted 28 January 2019, *Rapid Transition Alliance* (2023) cited in Buse and Bayliss (see footnote 19) https://rapidtransition.org/stories/turning-the-tide-of-water-privatization-the-rise-of-the-new-municipal-movement/ (accessed 26 May 2023).

[119] UK Government cited in Buse and Bayliss.

[120] Buse and Bayliss. The first new reservoir since the 1990s, due to open in 2029, is the Havant Thicket reservoir—a collaboration between Portsmouth Water, and neighbouring Southern Water (see https://www.economist.com/britain/2023/03/30/fixing-britains-national-water-supply-will-be-a-marathon)

[121] Bayliss and Hall, 'Bringing Water into Public Ownership: Costs and Benefits'; See also D. Helm, 'The UK Privatisation Experiment: A Success or Not?' [Podcast] 14 January 2023 https://dieterhelm.co.uk/regulation-utilities-infrastructure/podcast-36-the-uk-privatisation-experiment-a-success-or-not/ [accessed 10 June 2023]; S. Hendry, 'Should England Nationalise Water Services?'.

[122] 'Failures of Water Regulators, Water Companies and the Government are Leaving the Public and Environment in the Mire', *UK Parliament House of Lords* [Media Notice] 23 March 2023

apology in May 2023 for sewage spills and pledged £10 billion for a national overflows plan, tripling the amount of investment between 2020 and 2025.[123] That announcement drew widespread criticism from campaigners and the general public when it was confirmed that water bills would rise to fund this extra investment; critics argued that without dividends and bonus payments to executives this would not be necessary.[124] This links to the arguments made by John Simon in 1869 and repeated by Avery and Chamberlain.

The future of the water industry in England is unclear, but it is in a state of flux and public confidence in the sector is low. Should any potential 're-municipalisation' happen, it is unlikely to resemble the municipal ownership of a water supply described in this chapter. However, a return to the water regions or authorities that were created after the 1973 Water Act seems to be a preferred solution.[125] The economist, Professor Sir Dieter Helm, proposes a 'new start' for the water industry via a 'river catchment system'. Interestingly, parallels can be drawn here to the establishment of early drainage boards (Chapter Four), but Helm proposes that the catchment should encompass not only the water industry but the farming industry too, as a major source of river pollution comes through run-off from farmland. He

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https://www.parliament.uk/business/lords/media-centre/house-of-lords-media-notices/2023/march-2023/failures-of-water-regulators-water-companies-and-the-government-are-leaving-the-public-and-environment-in-the-mire/ [accessed 11 June 2023].

[123] 'Water and Sewage Companies in England Apologise for Sewage Spills and Launch Massive Transformation Programme', *Water UK* [Blog] 18 May 2023 https://www.water.org.uk/news-item/apology-transformation-programme/ [accessed 11 June 2023]; R. Kelly, 'We're Ready to Invest £10 billion as part of an Intense Programme of activity over the Next Seven Years' [Blog] 18 May 2023 https://www.water.org.uk/news-views-publications/views/were-ready-invest-ps10billion-part-intense-programme-activity-over [accessed 9 January 2024].

[124] F. Brown, '"Increase in Water bills to Pay for £10bn Investment", says Industry Chief', *Sky News*, 18 May 2023 https://news.sky.com/story/water-customers-will-see-modest-increase-in-bills-to-pay-for-10bn-investment-says-industry-chief-12883494 [accessed 11 June 2023]

[125] Bayliss and Hall; Buse and Bayliss; see various comments posted in 'Thirty Years On', *Chartered Institution of Water and Environmental Management.*

suggests that rather than having one national model, local authorities and environmental, wildlife and land charities should provide a system of regulation for each individual catchment area. Helm further highlights that consumers have a vital role to play in the way they consume and pay for water, suggesting changes involving collection and storage of water at home for non-drinking purposes.[126] Parallels can also be drawn here with the arrival of the supply from the Elan Valley and the fact that customers continue in the twenty-first century to 'tap unlimited supplies without extra costs'; most households are not metered and still pay an annual charge rather than for what they actually use.[127] A particular legacy of the Victorian sanitary revolution is the single system sewerage infrastructure where water, including rainwater and run-off, goes to treatment plants to produce drinking-quality water. One inefficient modern-day consequence of this system is that fully treated water is used to wash cars or water gardens.[128]

Regardless of whether the water industry becomes public, remains private or develops into a new mixed model, how people use, treat and manage water resources – with the challenges of climate change and increasing populations – is a key question for the twenty-first century.

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[126] Sir Dieter Helm is professor of economic policy at University of Oxford and Fellow in Economics at New College, Oxford; see his website at https://dieterhelm.co.uk/ [accessed 8 June 2023]. See also 'Water – A New Start' 18 October 2022 https://dieterhelm.co.uk/natural-capital-environment/water/water-a-new-start/ [accessed 8 June 2022]. Also D. Helm, 'Time to Pull the Plug on the Water Privatisation Model' [Blog], 12 May 2023, https://dieterhelm.co.uk/regulation-utilities-infrastructure/cleaning-up-the-sorry-state-of-our-rivers-is-not-rocket-science/ [accessed 10 June 2023]. See also video, 'How to Fix our Broken Water System' [Video] a talk given for London Rivers Week on 5 June 2023 https://dieterhelm.co.uk/natural-capital-environment/london-rivers-week/ [accessed 10 June 2023].

[127] D. Helm, 'Water – A New Start' 18 October 2022 https://dieterhelm.co.uk/natural-capital-environment/water/water-a-new-start/ [accessed 8 June 2022], p. 3 of PDF file.

[128] Helm, 'Water – A New Start', p. 3.

Conclusions

This chapter has explored the 'transition from private to public ownership in the modern period' and shown the development of a public utility by a single municipality.[129] In the first decade the council made no real significant changes operationally and closely followed existing plans of the private company. This suggests that the waterworks under private ownership was well run. Despite shareholder dividends, the company had invested in infrastructure to meet extra demand, increasing daily average distribution by 4.5 million gallons. Municipalisation brought the council jurisdiction over water supply, but also increased litigation and tensions with other local authorities and the city's ratepayers, particularly landlords. There were also internal differences between members of the same committee who had divergent interpretations of what public ownership meant and who should benefit. Reliant on local sources, the council successfully managed to address issues of quantity and increased the capability for daily distribution to over 18 million gallons by 1900. However, a continuous supply at this level presented a challenge when impacted by waste through faulty sewerage and climate. From the late 1880s the system was under incredible strain as demand increased – a signal that other sources of supply were needed.[130]

Following the lead of other cities like Liverpool, and learning from not being the pioneer, the council pursued the ambitious Elan Valley Scheme for a new supply, a monumental event in Birmingham's civic and social history. Examination of the economic aspects has shown that being in public hands was an important

[129] Taylor and Trentmann, 'Liquid Politics', p. 201.
[130] *History of the City of Birmingham Water Department*, p. 24.

component in the development of Birmingham's water supply as private companies did not have access to favourable financial terms and had to consider shareholders when determining policy. However, the financing of the Elan Valley Scheme involved a combination of long-term borrowing, increases for ratepayers and increased charges for consumers. Birmingham's experience highlights the difficulties in attempting to establish relationships between sanitary investment and mortality decline using analyses of broad datasets, for instance on borrowing, as these cannot reveal the full circumstances.

By the second decade of the twentieth century more citizens had unrestricted access to clean water and Birmingham was becoming a water closet city. This crucial investment made by the council, citizens and customers in the first half of the twentieth century accelerated improved sanitation across the city and continued to benefit future generations long after the original sixty to seventy years expected by Mansergh.[131]

Chapters Four and Five have detailed the development of waste management and water supply in Birmingham from the 1870s and have shown that both aspects reached a significant stage between 1905 and 1911. The start of bacterial sewage treatment at Saltley and Minworth and the arrival of supply from the Elan Valley accelerated efforts to improve sanitation in the city. While it had taken thirty years to reach this stage, how had council policy and the building of water and waste systems during those three decades impacted Birmingham citizens living in the 'unhealthy

[131] Bradford, Bridgeman and Gaterell. "A Review of the 1892 Water Demand Forecast for Birmingham'.

areas' with the worst sanitation?[132] The next chapter explores the impact on the inhabitants of the city's back to backs.

[132] M. Niemi, *Public Health and Municipal Policy Making Britain and Sweden 1900-1940* (Hampshire, 2007), p. 124.

Chapter Six

Back-to-Back Basics: A Courtyard Experience, 1873-1914

Bill Luckin suggests that many urban areas during this period had 'subtly different relationships between water supply, sewage disposal and preferred domestic sanitary technology'.[1] Tom Crook highlights 'place-specific' considerations for the choice of sanitary system and how often those choices became contested. Birmingham's experience offers a good case study of these issues.[2] This thesis has examined aspects of the relationships in Birmingham: between sewage disposal and water supply and how the sewage crisis of 1871 forced the council to choose a new dry conservancy system.[3] Anthony Wohl, Luckin and Crook agree that these systems became 'class-specific', and it is for this reason that this chapter assesses the extent and in what ways these municipal responses impacted the inhabitants of Birmingham's back-to-backs, rather than adopting a city-wide approach. Typically, the last areas to convert to water closets (WCs) were those where the poorest lived.[4] This was also because some of the central wards with the highest concentration of this type of housing were classified by the council as 'unhealthy areas'.[5] With the transition from well to tap and the strategy for the new conservancy system to

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[1] B. Luckin, *Death and Survival in Urban Britain: Disease, Pollution and Environment, 1800-1950* (London, 2015), p. 100.
[2] T. Crook, *Governing Systems: Modernity and the Making of Public Health in England, 1830-1910* (California, 2016), pp. 180-3.
[3] Conservancy systems are defined by the human collection, conveyance and disposal of waste.
[4] A. Wohl, *Endangered Lives: Public Health in Victorian Brita*in (London, 1983), pp. 108-9; Luckin, *Death and Survival*, p. 102; Crook, *Governing Systems*, pp. 181, 186.
[5] M. Niemi, *Public Health and Municipal Policy Making Britain and Sweden 1900-1940* (Hampshire, 2007), p. 124. The three wards determined as the unhealthiest areas because of their high death rates were St. Stephen's, St. Mary's and St. Bartholomew's.

replace ashpits, one research question is to investigate if the council achieved its objectives by improving the health of the inhabitants in these areas.

The chapter explores domestic sanitation with a particular focus on Birmingham's privy pan system, introduced in late 1873, which operated for up to four decades in some areas. The waste disposal aspects of the pan system have already been explored (Chapter Four); the focus here is therefore on the theory behind the method of interception and the actual system in practice in Birmingham. Some parallels can be drawn with what David Barnes reveals about Parisian *vidange* in his study of the *Great Stink of Paris* in 1880.[6] The present analysis goes further than existing historiography on waste management systems, exploring practice and material culture.[7] It assesses the impact of such systems on living conditions and health and considers what it was like to live amongst privy pans and ashpits.[8] As Roy Porter reminds, history comes 'deodorised' with little chance to smell or hear the past and this is considered.[9] William Tullett argues that the place of smell in nineteenth-century medicine and public health was 'ambiguous', as it was no longer 'bound to a single disease theory', and that sanitary strategies were pursued 'despite' and 'not because of the relationship between smell and disease'.[10] The chapter also brings in

[6] *Vidange* means cesspit emptying; see D. Barnes, *The Great Stink of Paris and the Nineteenth-Century Struggle against Filth and Germs* (Baltimore, 2006), p. 16.
[7] Luckin, *Death and Survival*, p. 94; Crook, *Governing Systems*, pp. 148-196.
[8] Barnes, *Great Stink of Paris*, p. 15.
[9] J. Reinarz, *Past Scents*: *Historical Perspectives on Smell* (Urbana, Chicago and Springfield, 2014), p. 184. Reinarz refers to Roy Porter's preface to the English translation of Alain Corbin's groundbreaking work, *The Foul and the Fragrant: Odour and the Social Imagination* (London, 1996).
[10] W. Tullett, 'Re-Odorization, Disease and Emotion in Mid-Nineteenth Century England', *The Historical Journal,* 62, 3 (2019), pp. 765-788, pp. 787-788; W. Tullett, *Smell in Eighteenth-Century England: A Social Sense* (Oxford, 2019). Tullett has written most recently on how archives can be 're-odorised'; W. Tullett, *Smell and the Past: Noses, Archives, Narratives* (Bloomsbury, 2023). This is one of the outcomes of 'Odeuropa', a European research project which bundles expertise in sensory mining and olfactory heritage and uses novel methods to collect information about smell from (digital) text and image collections. One of the aims of the project is to produce

another aspect that is rarely mentioned in contemporary sources. Like Nigel Morgan, Christopher French and Juliet Warren, Neil Davie and James L. A. Webb, it considers the summer problem of flies in urban areas, particularly the relationship with waste management and horse manure and the consequences for public health.[11] This chapter also argues that the council's difficulties over river pollution and inadequate water supply (pre-1904) had a significant influence on municipal policy to the lasting detriment of those living around a courtyard.

Despite the absence of some early departmental minute books, the council histories together with other contemporary sources facilitate a fuller understanding of the practice of Birmingham's municipal Nightsoil and Interception Department.[12] Local news sources provide a particular insight into the complaints and scandals associated with the department – often downplayed in council sources. The chapter begins by looking at the impact of the transition from well to tap in Birmingham's courtyards. It then turns to examine the city's conservancy systems and the closet dilemmas, in theory and in practice, followed by a closer look at what it was like to

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a free, publicly available, Encyclopaedia of Smell History and Heritage, see 'About Us' and 'Our Mission', *Odeuropa* (2023) https://odeuropa.eu/ [accessed 23 July 2023].

[11] Medical practitioners and their understanding of flies as a vector of transmission are discussed in more detail in Chapter Eight. N. Rogers, 'Germs with Legs: Flies, Disease, and the New Public Health', *Bulletin of the History of Medicine,* 63, no. 4 (1989); A. Hardy, *The Epidemic Streets: Infectious Disease and the Rise of Preventative Medicine* (Oxford, 1993), pp. 184-186; N. Morgan, 'Infant Mortality, Flies and Horses in Later-Nineteenth-Century Towns: A Case Study of Preston', *Continuity and Change,* 17 (2002), pp. 97-132; C. French and J. Warren, 'Medical Officers of Health and Infant Mortality: The Case of Kingston-Upon-Thames in the Late Nineteenth and Early Twentieth Centuries', *Local Population Studies*, 73 (2004), pp. 61-72; C. French and J. Warren, 'Infant Mortality in the Canbury Area of Kingston Upon Thames, 1872–1911', *Continuity and Change,* 22, 2 (2007), pp. 253-78; N. Davie, '"An Unbidden Guest at Your Table": Purity, Danger and the House-Fly in the Middle-Class Home, c. 1870-1910,' *Cahiers Victoriens & Edouardiens*, 85 (2017), unpaginated, available at https://doi.org/10.4000/cve.3151; J. L. A. Webb Jr, *The Guts of the Matter: A Global History of Human Waste and Infectious Intestinal Disease* (Cambridge, 2020), pp. 75-76.

[12] Key council minute books missing are the Borough Inspection Committee Minutes 1856-1860; Health Sub-Committee Minutes 1874-1882; and Interception Sub-Committee Minutes (pre-August 1880). Other sources used include W. A. Power, *Filth Removal: Progress at Liverpool and Birmingham* (Dublin, 1877), p. 10; Cadbury Research Library Special Collections, University of Birmingham (CRLSC), r p RA585.B5, *The Birmingham System of Refuse Disposal* (Birmingham, 1893).

live among ashpits and pan privies and their impact on inhabitants and their health. Finally, it explores municipal policy and the reasons why the pan system endured despite its contested status.

Transition to Pipe

Luckin suggests that despite 'large-scale investment' in water supply systems in the last quarter of the nineteenth century, there remained large differentials and class inequalities over quality, quantity and continuous supply.[13] The previous chapter demonstrated that expansion of the municipal supply and infrastructure took time amidst the multiple challenges of waste, climate and political resistance. This section explores the transition from well to pipe to establish how that development translated into Birmingham's courtyards and what impact it had on inhabitants' lives.

Chris Upton's *Living Back-to-Back* (2005) describes how 'in normal circumstances' the water tap, or standpipe, would be in the centre of the yard (Fig. 6.1) as a single source to serve the entire community.[14] Upton suggests that by the mid-1870s an average of 8,000 houses were connected to the municipal supply each year. However, that figure included new houses, courtyards and individual properties, and a history of the Water Department only records the number of houses in supply from 1895, making it difficult to establish how quickly the transition took place.[15] The main driver for the transition was the closure of polluted wells after the power to do so

[13] A. Hardy, 'Parish Pump to Private Pipes: London's Water Supply in the Nineteenth Century', *Medical History*, 11 (1991), pp. 76-93, p. 76; Luckin, *Death and Survival*, p. 106.
[14] C. Upton, *Living Back-to-Back* (Chichester, 2005), pp. 81-83, p. 81.
[15] Upton, *Living Back-to-Back*, p. 83; *History of the Birmingham Water Department* (Birmingham, 1974), p. 24. The number of houses in supply in 1895 is recorded as 131,087, the figure presumably deriving from a survey to check pipework in efforts to reduce waste around this time.

came with the Public Health Act 1875; over 3,000 wells were closed between 1876 and 1884.[16] Following the format of the 1875 Sanitary Survey (see Chapter Two), there was a further survey of 86,000 houses conducted a decade later in 1885.[17] Table 6.1 is the summary of that survey detailing the number of wells, ashpit and pan privies and WCs in each ward.[18] The table demonstrates that despite the closures, a high number of wells remained.



Figure 6.1: Slum housing in Birmingham c. 1901-1911.

Back of 33 and 34 and numbers 1 and 2 in No. 7 Court, Cheapside, Birmingham. Reproduced with permission of Library of Birmingham (WK/B11/1769).[19]

[16] Upton, *Living Back-to-Back*, p. 82; J. Reinarz, 'Industry and Illness: Investing in Health and Medical Provision' in C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 238-258, p. 254.
[17] A. Hill, *Report on the Health of the Borough of Birmingham for the Year 1885* (Birmingham, 1886), pp. 57-67 [hereafter *Report 1885*]. Of the 86,000 houses a total of 49,063 were front houses and 37,541 were situated at the back of other houses. A total of 4,783 were 'void', leaving 81,821 houses inhabited. Estimated population suggested an average of 5.2 persons in a house. St. George's, St. Stephen's and St. Mary's were considered some of unhealthiest wards.
[18] *Note: The total population of the borough is inclusive of the population in institutions which was 5,587, Hill, *Report 1885.*
[19] This photograph is part a of much larger collection: Birmingham Archives and Collections, Library of Birmingham (BAC), Warwickshire Photographic Survey (WPS), WK/B11/1571-2478 (17 boxes), Photos of Slum Housing arranged alphabetically by street.

Ward	Inhabitants	No. of Wells	No. of WCs	No. of Pan Privies	No. of Ashpit Privies
Rotton Park	31,612	124	814	2631	1056
All Saints	36,021	47	177	3614	851
Ladywood	29,662	12	584	2358	667
St. Paul's	18,866	12	728	1960	700
St. George's	23,077	3	361	1937	540
St. Stephen's	22,127	7	162	1545	522
St. Mary's	19,335	5	338	2067	308
St. Bartholomew's	27,624	49	538	2937	420
Market Hall	13,258	36	2813	1245	391
St. Thomas	23,812	12	515	1862	499
St. Martin's	24,265	113	283	1620	663
Edgbaston	24,111	410	2531	1163	1905
Deritend	28,547	77	255	2161	933
Bordesley	45,689	311	562	4995	1690
Duddeston	22,933	18	152	2185	740
Nechells	31,243	26	80	2605	1027
TOTAL	***422,182**	**1262**	**10893**	**36885**	**12912**

Table 6.1: Summary of the 1885 Sanitary Survey of 86,000 Houses in Birmingham by Ward.

Information taken from the *MoH for Birmingham Annual Report 1885* (Birmingham, 1886), p. 66.
*Note: The total population of the borough is made up with inclusion of population in institutions which was 5,587.

However, when compared with the survey of 1875, it reveals that the Medical Officer of Health (MOH) and sanitary inspectors targeted some of the most densely populated wards with the older courts in their campaign. For instance, only three wells are recorded for St. George's ward, when there had been 1,244 houses recorded as supplied by pump in 1875.[20] Similarly, there were seven wells for St.

[20] BAC, Birmingham City Council Collection (BCC), BCC1/AR/1/1/7, Sanitary Committee Minutes 1874-1876, 'Tabulated Statement of the Sanitary Census of the Borough of Birmingham Jan 30, 1875', 3 February 1875; Hill, *Report 1885*.

Stephen's ward, when previously there had been 1422 houses supplied by pumps.[21] This can be compared with 410 wells in the less densely populated Edgbaston ward where many of the elite lived. The council histories celebrate the well closures as a public health success story and John Thackray Bunce suggests that 60,000 people had been 'furnished with pure water' due to well closures and connection to the municipal supply.[22] After the sanitary reports and Birmingham's MOH condemnation of polluted wells, councillors may have presumed that there was a positive impact on public health, a belief which is explored later.

Being connected meant water charges, which Upton suggests not all landlords could afford, as many were small business owners who had grouped together to invest in property to generate extra income.[23] In 1886, the Water Department's water rental was based on two scales, depending on whether the landlord or the occupiers were responsible for paying the rates and taxes of the property.[24] By 1915 this system was replaced with a completely new scale with the annual charge calculated as a percentage of the rateable value of the house.[25] These extra charges were probably passed on by landlords through higher rents to the tenants and the council's Water Department was kept busy in chasing unpaid water rents.

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[21] The Sanitary Survey of 1875 conducted a house survey, and therefore did not offer statistics on how many wells there actually were and the number of people each well served.
[22] J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885), pp. 105-106.
[23] Upton, *Living Back-to-Back,* p. 40.
[24] The General Water Rental was rental charged to owners or occupiers of houses whose net or rateable value was under £50 a year. For a landlord with a property at a weekly rent of 3s 6d, water charges were 6s per annum between 1884 and 1886, and by 1893 (after passing of the Water Scheme Act), they increased to 8s. For occupiers with a weekly house rent of between 5s 9d and 6s 9d the water charges were between 8s and 12s, which increased to 16s by 1886 and then to £1 4s 0d in 1893; see Bunce, *History of the Corporation II*, p. 440 and C. A. Vince, *History of the Corporation of Birmingham, Vol. III* (Birmingham, 1902), pp. 326-327.
[25] For instance, houses with a rateable value of less than £10 were charged 8.5 percent and for those rated between £10 and £17 the charge was 10 per cent. Bunce, *History of the Corporation II*, p. 440; Vince, *History of the Corporation III*, pp. 326-327; Vince, *History of the Corporation of Birmingham, Vol. IV* (Birmingham, 1923), p. 454.

After the mid-1870s, due to the prohibition of drawing domestic water from the Tame and the greater use of more deep wells, the quality of the piped supply became better for the back-to-back inhabitants. However, the problem of quantity persisted with water shortages between 1892 and 1904, and consequently the provision of mains water to working-class housing remained inadequate.[26] Both quality and quantity improved at the start of the new century, with better fittings and the arrival of filtrated water from Wales, and any occasional service interruption was due to frozen or broken pipes. However, it took time for indoor plumbing to arrive in the back-to-backs and even that was normally just a single tap supplying cold water (Fig. 6.2). This provided labour-saving convenience, but the luxury of a scullery tap attracted a higher rent, which acted as a barrier to the poorest.[27] Many 'crock' sinks did not have drains to take away wastewater and this still left the task of how to dispose of the 'slops'.[28]

The pace of change for those living back-to-back was slow: by the second decade of the twentieth century over 42,000 houses did not have a separate water supply and 52,000 did not have separate toilet facilities.[29] This can be contrasted with the situation in 1935 when 13,650 houses were without mains supply. Although indoor plumbing arrived in the interwar years, some homes remained unconnected due to structural problems or the unwillingness of landlords and occupiers to pay for improvements.[30] However, little had changed by 1935 so far as toilet facilities were

[26] L. W. Jones, 'Aspects of Birmingham Community Power Around 1900: A Study of Decision Making (Unpublished MPhil Thesis, University of London, 1992), p. 179; D. J. Eveleigh, 'The Decline of Drudgery? Women and the Home, *History West Midlands*, 2, 4 (2014), pp. 36-38, p. 37.
[27] Upton, *Living Back-to-Back*, p. 70.
[28] *Ibid.*
[29] At this stage 43,366 back-to-backs still housed 200,000 people; Upton, *Living Back-to-Back*, pp. 48, 83.
[30] Crook, *Governing Systems*, p. 187.

concerned, with 51,794 houses without an internal toilet due to housing design and a lack of space.[31] The next section looks more closely at courtyard conservancy before exploring the theory and practice of the new system chosen by the council.



Figure 6.2: Photographs of Scullery Areas at the National Trust Birmingham Back to Backs.

The first image shows a recreation of an 1890s scullery and the second image a recreation of the scullery area in the 1930s with an internal cold-water tap. Photo: Author's own taken October 2022 and included with permission of National Trust Birmingham Back to Backs.

Closet Dilemmas

As Crook highlights, Birmingham was not alone in its closet dilemma. By the 1890s more than thirty towns had some form of dry conservancy system.[32] The principal method used in Birmingham was the ashpit, or midden, which was considered by the authors of the sanitary reports in the 1840s and the Sewage Inquiry of 1871 to be a

[31] Upton, *Living Back-to-Back*, pp. 48, 83.
[32] Crook, *Governing Systems,* p. 182.

danger to health, left open and exposed to the air, causing disease because of a miasma of filth.[33] At the end of 1871, Birmingham's authorities had taken the decision to pursue a policy of abolition for the ashpit and replace it with the privy pan; in Gateshead, however, ashpits were still being installed at the end of the century and about 18,000 were in existence in 1913.[34]

The 1871 Sewage Inquiry had established that there were almost 20,000 ashpits in Birmingham. The Public Works Committee (PWC) recorded that 24,390 ashpits were emptied during 1870, which suggests an infrequent once-a-year system of emptying for some ashpits.[35] Before the council could move forward with the plan for abolition, the backlog of applications for emptying had to be tackled. To meet demand, the superintendent of nightsoil had no choice but to increase manual labour from 129 workers to 214 and source extra boats, horses and carts.[36] Even after the backlog was tackled, the work of the department was greater than at any time under the direction of the PWC, suggesting that it had previously been seriously understaffed.[37] By 1880, the nightsoil section had expanded with a staff of forty-four 'getters out', eighteen carters and seven wharf men generating forty-four boat loads of mixed privy and ashpit manure per week at various wharves across town.[38] If the department

[33] BAC, L.45.4.2107, *Report of the Sewage Inquiry Committee* (Birmingham, 1871),
[34] Crook, *Governing Systems*, p. 180.
[35] Nightsoil was the responsibility of the Public Works Committee between 1853 and 1872 when it passed to the new Sewage Committee after the Sewage Inquiry. Bunce, *History of the Corporation II*, pp. 141, 147.
[36] At the start of 1875 there were 3,271 applications 'remaining on the books' and over 5,700 further applications were made between March and May. This coincides with the Health Committee's sanitary survey of the town, suggesting that the increased applications were nuisance orders from the department's own sanitary inspectors. BAC, BCC1/AW/1/1/1, Sewage Committee Minutes, Report dated 11 May 1875,
[37] In 1877 there were 10,900 applications from inhabitants and 9,252 applications from sanitary inspectors. A total of 28,657 ashpits were emptied, producing 93,177 cartloads. A total of 1,244 ashpits were abolished. Statistics taken from A. Hill, *Report of the Health of the Borough of Birmingham for the Year 1877* (Birmingham, 1878).
[38] BAC, BCC1/AR/3/1/2, Interception Sub-Committee Minutes, 5 August 1880.

under the PWC had been understaffed, this may explain why the ashpits were in such a poor state, as revealed by the Sewage Inquiry. However, once control passed to the Sewage Committee, it quickly became apparent that there was fraudulent behaviour amongst the nightsoil staff. In one instance, three men who were under suspicion were watched during the night and found to be charging for cartloads they had not removed. An example was made of these men to stamp out such practices as they had defrauded the council of a sum of 8s 3d through overcharging. The men were prosecuted and sentenced to a month's imprisonment with hard labour.[39] If this type of dishonest practice was commonplace within the department, doubt must be placed on the accuracy of any statistics before 1874 and, in combination with low staffing levels, this may explain the poor state of the ashpits. The PWC had accepted the given statistics for emptying in good faith but evidently there was a lack of supervision with few checks on work done, due to the unpleasant and nocturnal nature of the work. Such manual work was also hindered by the awkward design of back-to-back housing with only a narrow entry and no access for carts. This increased the labour for 'getters out' as they had to dig out the ashpits by hand and load the waste into boxed wheelbarrows to transport it to the carts outside or leave it heaped in the streets to be collected by carters before the morning.[40]

Records suggest that the plans for abolition did not proceed quickly, as in 1883 there were still 14,600 ashpits in the city and the number of nightsoil employees had

[39] BAC, Printed copy of *Sewage Committee Report for the council meeting 10 February 1874,* p. 11 inserted into BCC1/AW/1/1/1, Sewage Committee Minutes.
[40] Power, *Filth Removal*, p. 11; CRLSC, *Birmingham System of Refuse Disposal*. Typically for waste removal, nightsoil staff worked from 10 pm to 8 am, entering poorly lit courtyards while residents were asleep. Once nightsoil was deposited at a wharf, other workers transferred any surplus not sold to farmers as manure to land tips away from the town. It was the sale of manure which generated a small income for the old department.

increased to seventy-seven.[41] With the new pan conservancy system well established by this point, this number was high, which raises the question of why the council's strategy to abolish ashpits was not effective. A local magistrate's case from 1879 offers the answer. Leonard Watkins of Guest Street was summoned to the magistrates for non-payment of fines for the state of ashpits on his property and for ignoring sanitary inspectors' orders. During the hearing, Watson claimed that the council harassed property owners until they adopted the pan system, which suggests that the council was not averse to tactics of coercion using the threat of prosecution. However, a crucial point was clarified by the judge when he confirmed that Watkins 'was not compelled to adopt the pan system' if he provided 'proper conveniences'.[42] Despite being an Urban Sanitary Authority, the council was powerless to enforce the adoption of pans over the ashpit if property owners attended to the ashpits. To move forward with its plans, the council changed tactics and through the power of its own bye-laws for new buildings, stipulated the adoption of the pan privy for new buildings of a certain class.[43] Hence, the pan system expanded but pan privies did not always replace ashpits in the older courts, as originally intended. The 1885 survey records 13,000 ashpit privies, representing a small decrease over two years and therefore demonstrating the continued resistance from landlords to council interference (Table 6.1).[44] Although the number of ashpits gradually reduced by the start of the twentieth

[41] BAC, BCC1/AR/3/1/2, Interception Sub-Committee Minutes, 5 January 1883; CRLSC, *Birmingham System of Refuse Disposal*, this publication simply states that there were a considerable number of ashpits in the town emptied by 74 men and 40 horses. Hours of work were between 10 pm and 8 am and the carts measured 5 feet 10 inches by 3 feet 10 inches by 1 foot 11 inches inside and weighed 12.5 cwt. During 1892, 50,069 loads were collected weighing one ton each. This department also had 34 canal boats to transport this waste.
[42] *Birmingham Daily Post (BDP)*, 18 January 1879.
[43] Power, *Filth Removal*, p. 10. After 1876 the council banned the building of back-to-backs in the town but could do nothing about existing ones.
[44] Hill, *Report 1885*, p. 66. Ashpits did diminish, with 516 'wet ashpits' recorded in 1908, BAC, BCC1/AR/3/1/7, Interception Sub-Committee Minutes 1904-1910, 18 September 1908.

century, the work of the nightsoil section did not peter out entirely as the city's 1911 boundary extensions brought in new districts with existing sewage problems, including Yardley with its numerous cesspools.[45]

Administratively, control over conservancy systems passed to the Sewage Committee in 1872 and then to the Health Committee in 1876. With a re-organisation of committees in the wake of the 1875 Public Health Act, this committee's mandate was to direct the 'sanitary arrangements of the town'.[46] Operationally there was segregation of processes for the collection and disposal of nightsoil, designated the 'old' system, and the 'new' system of interception which utilised new technological disposal methods (see Chapter Four).[47]

A Solution: The Birmingham Pan System

Members of the Sewage Inquiry Committee, chaired by Alderman Thomas Avery, had been tasked with reporting on the sewage crisis in Birmingham and offering recommendations on how the council should proceed in response. After making enquiries about the systems in use in other towns and cities, they settled on a

[45] Vince, *History of the Corporation IV*, pp. 179-180.
[46] Bunce, *History of the Corporation II*, pp. 95, 140-141. The restructuring was partly necessitated by the formation of a drainage board and the corporation's undertaking of the water supply, drawing Alderman Avery away from the Sewage Committee and the implementation of the new interception system. The Health Committee was the Sanitary Committee (formerly Borough Inspection Committee) renamed with extra responsibilities. Despite the transfer of authority there were individuals who were members of both the Sewage and Health Committees and this aided continuity. They included Dr Alfred Barratt, a close colleague of Avery, who was a Birmingham physician who had trained at the local Queen's College. Barratt had joined the council in 1870 as one of the new wave of Liberal businessmen and professionals and was immediately involved in the drive for reform (*Birmingham Weekly Post*, 20 November 1909). In 1876 another medical professional, the eminent surgeon Robert Lawson Tait, joined the Health Committee; he had made his name at Birmingham's Women's Hospital with pioneering gynaecological surgery. See Appendix 1: Index of persons and D. A. Power revised by J. Eliott Sewell, 'Tait, (Robert) Lawson (1845-1899)', *Oxford Dictionary National Biography* (Oxford, 2013). Reinarz, 'Industry and Illness in *Workshop of the World*, pp. 238-258, p. 254.
[47] BAC, BCC1/AR/3/1/2, Interception Sub-Committee Minutes, 5 August 1880.

version of the ‘Rochdale pail’ to become the ‘Birmingham pan’.[48] It is important to understand what influenced the councillors’ decision, how they envisaged the system might work in practice, and what their expected outcomes were.

One of the main attractions was that the system was simple in terms of installation: a privy contained a receptacle placed under the closet seat. The objective was to *intercept* excreta, before it could enter the sewers or drain into the surrounding ground, hence the department name. Where the ashpit system saw the mixing of ashes, food waste and excreta all together, the new pan system required separation of wastes with another receptacle specifically for ash (see Fig. 6.3 for examples).[49]

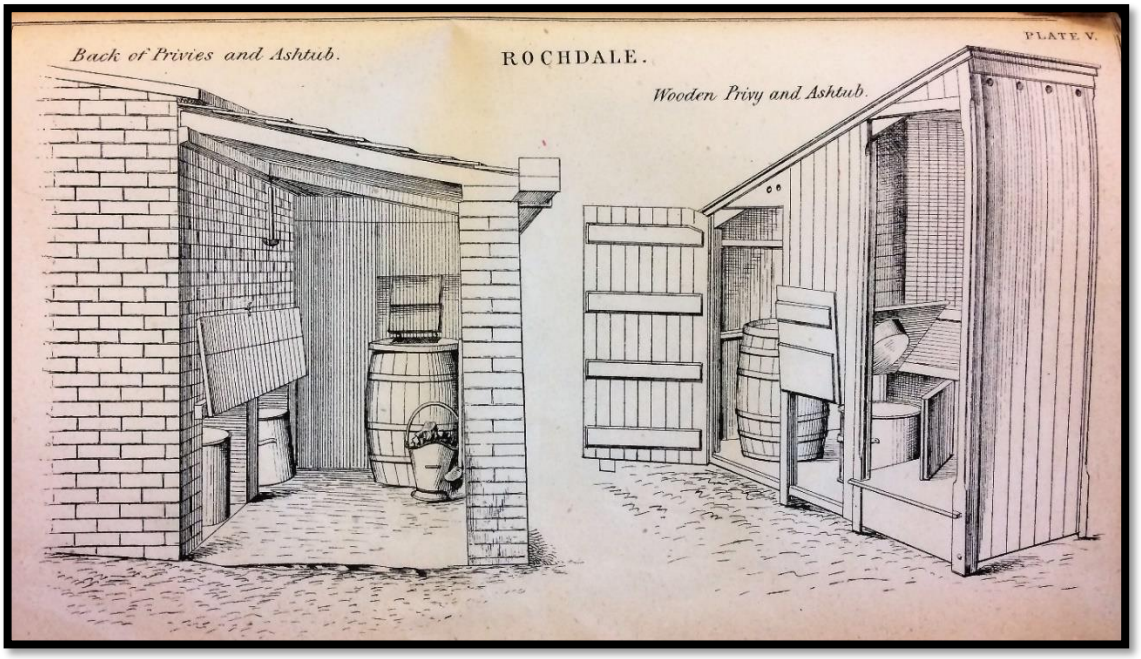


Figure 6.3: Drawing of Privy Design in Brick and Wood as used in Rochdale.

From *Report of the Sewage Inquiry Committee, Appendix XII* (Birmingham, 1871). Reproduced with permission of Library of Birmingham, L45.4.2107.

[48] For more on pail closets, see Crook, *Governing Systems*, pp. 180-183. The Birmingham pan system was a pail system and is not to be confused with the pan closet (Crook, p. 183).
[49] Bunce, *History of the Corporation II,* pp. 140-141.

Although approved by the full council in 1871, this new system did not start until late 1873. This was because property owners had to convert their existing privies at their own expense and had to purchase the galvanised iron pans from the council (see Fig. 6.4 for a drawing of a Birmingham pan). There is no evidence of any incentive scheme or contribution from the council, and this was probably another reason for landlords to persist with ashpits.[50] The aim of the new system was an 'efficient and regular' collection, with pans collected once a week and replaced with a clean one; the dirty pans were taken to a council wharf for emptying and disinfecting.[51]

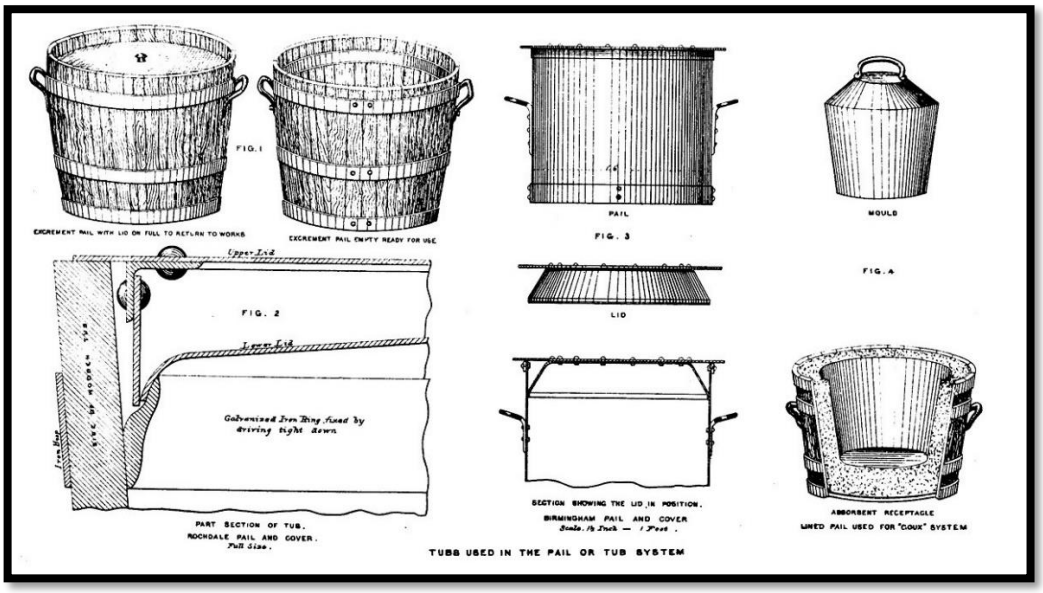


Figure 6.4: Tubs used in the Pail System, including the Birmingham Pan.

Taken from E. C. S. Moore, *Sanitary engineering: a practical treatise on the collection, removal and final disposal of sewage, and the design and construction of works of drainage and sewerage, with a special chapter on the disposal of house refuse and sewage sludge, and numerous hydraulic tables, formulae & memoranda, including an extensive series of tables of velocity & discharge of pipes & sewers, especially computed by Ganguillet and Kutter's formula* (London, 1898). *).* This material has been provided by The University of Glasgow Library. The original may be consulted at The University of Glasgow Library. Public Domain Mark

[50] Contemporary reports describe the pans as larger than the ones used in Rochdale. Power, *Filth Removal*, p. 10; CRLSC, *Birmingham System of Refuse Disposal*. The pans were galvanised iron, 18" in diameter and 15" in depth and weighed 28 pounds each.
[51] CRLSC, *Birmingham System of Refuse Disposal*, pp. 7-8.

This was the key benefit that councillors expected from the system: on paper the system looked cleaner and more organised and the regular removal of waste from the domestic environment would be beneficial to health. Councillors did not simply come to these conclusions by themselves; the *Twelfth Report of the Medical Officer of the Privy Council* (1869) conducted a survey of dry methods and a debate on pail closets and there was agreement that they were an improvement on 'midden systems and cesspools' thanks to regular removal.[52] The members of the Sewage Inquiry Committee, which included a medical practitioner, took a decision in what they believed was good faith: they addressed the sewage issues with river pollution and installed a simple system quickly to address the Chancery Court orders, with the added benefit of doing something that was considered at that time to be more beneficial to health than ashpits.

Initially small-scale, the pan system began with weekly collections from about 1,700 privies. The Interception section comprised ten men, five horses, three vans and two dust carts. It was soon apparent that the demands of the work had been underestimated, and therefore additional workers and transport were required.[53] By 1877, the system had expanded considerably (as shown in Table 6.2) through the inclusion of board schools and manufactories, with the result that by 1883, the department had over 220 employees.[54] Transport was an integral part of the system with fifty-seven vans and sixty ash carts and 124 horses in service in the early 1880s

[52] *Twelfth Report of the Medical Officer of the Privy Council* (1869), pp. 111-140 cited in Crook, *Governing Systems*, p. 182.
[53] BAC, BCC1/AW/1/1/1, Sewage Committee Report 1874. Overseeing nightsoil and interception was a superintendent; in the first instance, Mr Woolley (the borough's Inspector of Nuisances) was given this additional role for extra pay. As the department grew it became a separate post.
[54] Bunce, *History of the Corporation II*, pp. 147-148. Staff of the Interception department included the superintendent, collectors, foremen, ash-men, wharfmen and stokers.

and this required the building of stables across the city.[55] Collected pans were delivered to three main council wharves at Montague Street, Shadwell Street and Rotton Park Street, for processing and disposal (Chapter Four).[56] Sources suggest that the early vans were covered and had doors or flaps but there were design changes to address the problems of 'slopping' and smell escaping.[57] The ashes and other refuse were emptied into open carts. By 1893 the vans in use had been adapted to carry eighteen pans with a separate area where ash-tub refuse could be tipped.[58] This expansion was evident in the rising expenditure for municipal waste management, increasing from £13,880 in 1871 to almost £45,000 by 1879. By the mid-1880s the pan system was at its peak with over 38,000 pans in service.[59] Birmingham's pan system remained in operation for almost forty years before finally being phased out in 1914-1915.[60] It formed part of an extensive waste management programme of collection, processing and disposal using the new technology of destructors and dryers (see Chapter Four).

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[55] A rare example of a building that housed council stables remains in Sheepcote Street in Birmingham; see The Roundhouse, https://www.nationaltrust.org.uk/visit/birmingham-west-midlands/roundhouse [accessed 26 July 2023]. Records confirm that some of the Health Committee's horses were stabled there.
[56] BAC, BCC1/AR/3/1/2, Interception Sub-Committee Minutes, 5 Aug 1880.
[57] Power, *Filth Removal*, p. 11. The tightly fitting lid as shown in Figure 6.4 became a crucial component to prevent the slopping of contents while being carried by the men.
[58] CRLSC, *Birmingham System of Refuse Disposal*, pp. 7-8. Pans were collected between 10 pm and 8 am and the city (12,365 acres) was divided into districts with every pan to be collected once a week. A van could make 3 to 5 journeys per night depending on distance to travel. The van when fully loaded with pans and ash waste could weigh 1 ton 11 cwt.
[59] Bunce, *History of the Corporation II*, pp. 147-148. By the mid-1880s the system had made over 1.9 million pan collections; it collected almost 74,000 loads of ash and refuse, all delivered to the wharves at Shadwell Street, Montague Street and Rotton Park Street. The Health Committee continued to administer these departments until 1911 when use of conservancy declined. This was because the arrival of water from Wales meant that the council could adopt the policy of moving towards full water carriage. Even though there remained a small number of ashpits and privy pans in the borough, by 1911 the department primarily dealt with refuse and no longer fell under the remit of the council's new Public Health Department, so it was instead brought under Lighting, Stables and Refuse Disposal.
[60] Vince, *History of the Corporation IV*, p. 177.

Interception Statistics for 1877	
Number of loads of excreta removed by vans	43,163
Number of pans collected	776,934
Number of loads of ashes removed	44,788
Number of privies supplied with excreta vessels	6,648
Number of houses with privies constructed on the new system	10,230
Number of manufactories	534
Number of schools	12
Total number of persons using	47,262
Number of privies supplied with excreta vessels on 31 December 1877	**22,668**

Table 6.2: Statistics for the New Interception System in 1877.

Statistics taken from A. Hill, *Report on the Health of the Borough of Birmingham for the Year 1877* (Birmingham, 1878).

However, contrary to being part of the solution for the town's sewage crisis, the pan system became increasingly contested. The next section explains why and shines a spotlight on collection practices mired in complaints and scandal.

Contested: Birmingham Pan System in Practice

A key problem became quickly apparent. Property owners did not 'erect a sufficient number of privies' for the number of tenants living around the courtyard.[61] Obvious issues with the once-a-week collection system meant that inhabitants were most likely without proper toilet provision for most of the week if the pans were filled quickly. This situation persisted and tended to go unreported unless a death from an infectious disease brought inspection by the MOH or sanitary inspector. In 1883 a death from typhoid exposed the fact that only three pans were available for sixteen

[61] BAC, BCC1/AW/1/1/1, Sewage Committee Report 1874.

houses at Court 21, Lower Essex Street.[62] Even at the end of the century, at least sixty people were found to be sharing six pans at Court 4, Sun Street.[63] Again, the council appeared to be powerless to enforce adequate closet provision in the older courts and there was little space, leaving tenants with inadequate and unhygienic toilet facilities. The implications of this are discussed later.

As the system and workforce expanded, issues with the collection service became more commonplace and complaints increased. As with nightsoil collection, the design of the back-to-backs meant that the interception vans and dust carts could not access the courtyards. For workers this meant that full heavy iron pans had to be carried some distance during their night-time shift; the inevitability of spillage highlighted the importance of a secure lid. Any spillages in the privies, courtyards or alleys were not cleaned up by collectors, resulting in complaints of filthy conditions. There were also complaints about ashes not being collected, most likely because the ash barrels had to be rolled to the vans for emptying and then rolled back.[64] Poor access, heavy lifting and overflowing pans led to the development of bad practices within the department. This was revealed during an employee and committee dispute reported by the *Birmingham Daily Post,* which resulted in an internal enquiry into the Health Committee in 1890. As with nightsoil removal, fraudulent practices were revealed, with overcharging and false recording provoked by a system of pay based on the number of collected pans, rather than a regular weekly wage. Other questionable practices had greater implications for public health. Evidence to the enquiry revealed the commonplace practice of emptying half-full pans into other pans

[62] BAC, BCC1/AR/3/1/3, Interception Sub-Committee Minutes, 16 February 1883.
[63] BAC, BCC1/AR/3/1/6, Interception Sub-Committee Minutes, 21 April 1899.
[64] BAC, BCC1/AR/3/1/2, Interception Sub-Committee Minutes, 5 January 1883.

and emptying of pan contents directly into the drains, contrary to the system's aims.[65] One problem was the weight of full pans when lifted onto the vans: sometimes they were dropped in the street, causing the contents to spill everywhere.[66] This meant that some pans were left uncollected for weeks and not returned to the wharves for proper disinfection. Some similarity can be drawn with Barnes's research into the Great Stink in Paris in 1880 with reports of illegal dumping of the contents of cesspits into Paris's sewers and citizens' complaints about *vidangeurs* and their night-time practices.[67] The pan system, which had looked so possible in the illustrations of the 1871 *Sewage Inquiry Report*, was not so successful when applied in the overcrowded, unpaved and poorly lit courtyards, with too few privies.

The Birmingham council internal enquiry resulted in the dismissal of workers but, unsurprisingly, the exoneration of the Health Committee. The system continued with attempts to address the bad practices and more foremen employed to supervise and watch the collectors.[68] Council records reveal the problems with recruiting and retaining reliable workers willing to operate a system such as this, as workers previously dismissed were re-employed. There were numerous complaints of drinking and drunkenness, not helped by the night shift patterns of 10 pm to 8 am. Other complaints included abuse, duties not properly performed and the poor care of council horses. This suggests that workers deemed unsuitable for other jobs, perhaps because of habitual drinking, found employment in performing the unpleasant tasks that no-one else wanted to do at night. The department

[65] *BDP*, 16 July, 1 August, 18 September and 2 October 1890.
[66] *The Tamworth Herald*, 27 July 1878.
[67] *Vidangeurs* – cesspit cleaners, the equivalent of nightsoil men or pan collectors in Birmingham; see Barnes, *Great Stink of Paris*, pp. 16, 24.
[68] *BDP*, 16 July, 1 August, 18 September and 2 October 1890.

superintendent often suggested to the committee that attracting ‘a better class’ of worker would require a higher wage.[69] Again, there is some similarity with Parisian sewer men described as ‘drunken, rowdy, noisome cesspool cleaners’, who were often convicts.[70]

As the system expanded, so too did the number of foul-smelling collection vans, travelling across the town at night to the council wharves to be processed. Barnes refers to night-time cesspit emptying being dictated by law to ‘minimize inconvenience’ primarily because of ‘the sheer smell’ from the operation.[71] But noise was a problem too. Across Birmingham, the noise from horseshoes, iron vans and pans coupled with drunken workers led to numerous complaints, with both the vans and workers labelled as ‘demons of the night’.[72] Jonathan Reinarz refers to this traditional ‘othering’ of waste removal workers who were considered ‘untouchables’.[73] An 1877 cartoon from Birmingham satirical magazine, *The Dart* (Fig. 6.5) exemplifies this, with vans and collectors depicted as carrying disease and death through the streets. There were also complaints about the processing wharves themselves, located within the city centre and close to houses. John Gillespie of Montague Street pleaded with the council to buy his house as he considered it ‘rendered void’ due to the nightly noise; however, the council refused.[74] Then there was the nusiance of smell, with the General Hospital complaining about the smell from the Shadwell Street plant in prevailing winds. Because the miasmatic theory was still prevalent,

[69] BAC, BCC1/AR/3/1/2, Interception Sub-Committee Minutes, 17 September 1880,
[70] D. Reid, *Paris Sewers and Sewermen: Realities and Representations* (Cambridge, 1991) cited in Reinarz, *Past Scents*, p. 165.
[71] Barnes, *Great Stink of Paris*, p. 24.
[72] *BDP*, 28 August 1900.
[73] Reinarz, *Past Scents*, p. 164.
[74] BAC, BCC1/AR/3/1/3, Interception Sub-Committee Minutes, 9 March 1888. Montague Street wharf was the largest and main processing plant for privy pan contents.

hospital design and treatment at that time was centred around ventilation with open windows on the wards: smell was perceived to be a real risk to health. Despite this, Birmingham's MOH ruled that there was not a nuisance or danger to health as the council could not threaten legal action against itself for nuisance. Later, however, intensified attempts were made to find a suitable deodoriser for the pans and holding tanks.[75]

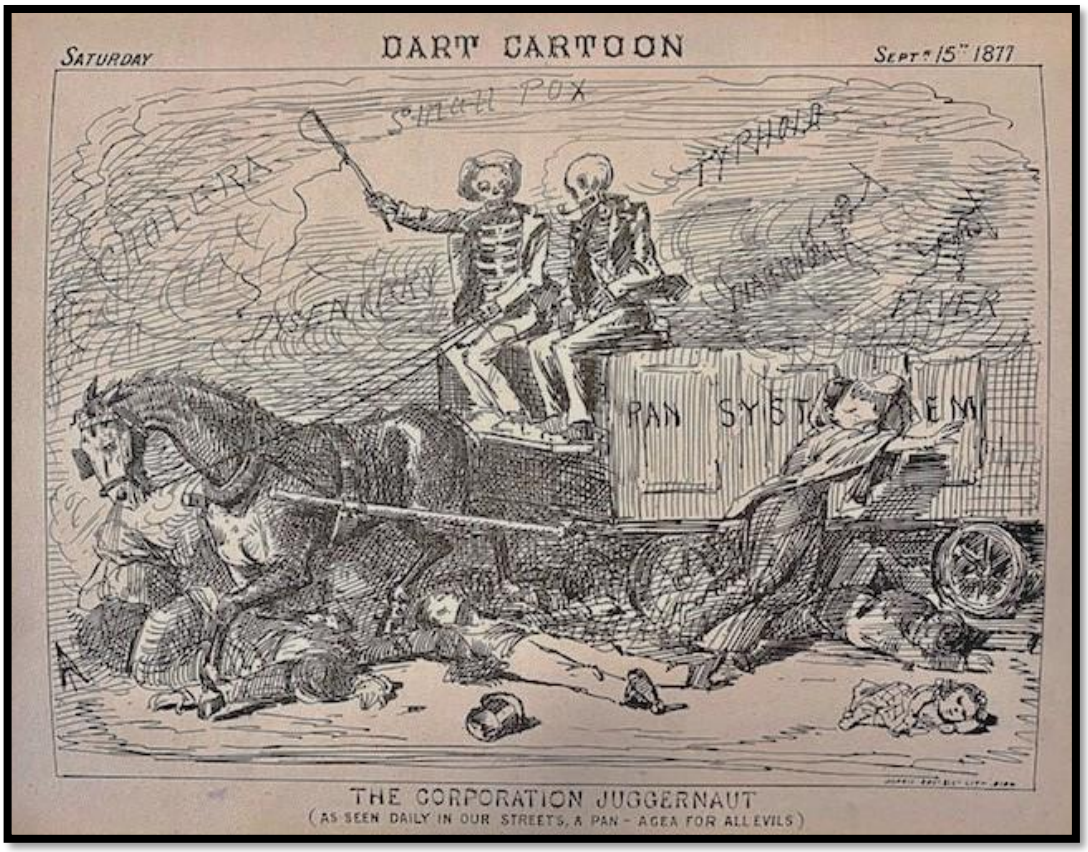


Figure 6.5: 'The Corporation Juggernaut', *The Dart,* 15 September 1877

Reproduced with permission of Library of Birmingham.

[75] BAC, BCC1/AR/3/1/2, Interception Sub-Committee Minutes, 7 January 1881.

Despite its inherently problematic nature becoming evident early on, this smelly and noisy system continued for decades (the reasons for its persistence will be explored later in this chapter). Looking beyond the practical implementation of the system and the experience of the workers, the next section considers what living with pan privies and ashpits was like for the inhabitants of Birmingham's courts.

Impact on Inhabitants and Health

The inhabitants of Birmingham's back-to-back houses had no input or choice regarding the type or number of privies or closets provided for their rented accommodation. With a particular focus on the period between 1877 and 1902, this section considers the sensory living environment of the back-to-backs and its impact on health through closer examination of those local wards which were classified as unhealthy.[76]

According to council minutes, substituting pans for ashpits was initially well received.[77] In October 1875, councillors visited some of the worst wards and reported that inhabitants found the system 'satisfactory' and considered the pan privy an improvement.[78] At a meeting of the Birmingham Landlords' and Ratepayers' Mutual Protection Association in 1878, however, members loudly declared their continued opposition to the scheme. They complained of 'the added costs of improvement and taxation' that had been placed upon them and blamed the council for the rent

[76] See footnote 5.
[77] *BDP*, 24 June 1874.
[78] BAC, BCC1/AR/1/1/7, Sanitary Committee Minutes 1874-76, 27 October 1875.

increases it had been forced to implement.[79] Bunce, in his council history published in 1885, suggests that there was 'considerable opposition' from the start, not only to the cost but also to the 'alleged uncleanliness and offensiveness' of such systems.[80]

Reinarz makes the point that sanitarians and other interested observers were the only witnesses to smell and noise conditions at that time.[81] Newspapers referred to 'noxious smells' and 'reeking' privies with 'effluvium arising from the cans as they were removed'.[82] At canal wharves the 'smell was dreadful' and even supposedly clean pans gave off a 'sickening stench'.[83] The emptying of ashpits 'pollutes the air for a mile around and fills the bedrooms with a terrible smell'.[84] Birmingham's MOH often reported the 'offensive' nature of the privies, and how the 'effluvium' could not be dispersed by air due to poor ventilation in the courts, adding that ashpits produced 'atmospheric contamination'.[85] If the privy was next to the brewhouse and the copper had been used for washday, then the pan became hot and would 'emit a more than ordinary sickening odour'.[86] This supports Tullett's argument about the changing relationship between smell with disease, with MOH Dr Alfred Hill seeming to impute a greater danger to health from the smell of ashpits due to contamination compared with the sheer offensive smell from the privy pans.[87]

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[79] CRLSC, r LB2831, Birmingham Landlords' and Ratepayers' Mutual Protection Association, *Speech by Henry Hawkes Esq. J.P. and Annual Report and Proceedings of the Association* (Birmingham, 1878), pp. 22-23.
[80] Bunce, *History of the Corporation II*, p. 142.
[81] Reinarz, *Past Scents*, p. 189.
[82] *The Tamworth Herald*, 27 July 1878
[83] *BDP*, 8 August 1878 and 30 September 1884.
[84] *BDP*, 19 June 1889.
[85] A. Hill, *Annual Report on the Health of Birmingham for 1902* (Birmingham, 1903), pp. 39, 41.
[86] *Ibid*., p. 41.
[87] Tullett, 'Re-Odorization, Disease and Emotion', pp. 765, 787-788.

As Barnes points out, 'odorless words' cannot fully offer the 'sensory experience' of living with consistent bad smells.[88] In the only preserved back-to-back courtyard in Birmingham, the smell, noise and smoke of the nineteenth century is not reproduced.[89] Urine and excrement left standing in iron pans smelt bad, but what cannot be known is exactly how much habituation there was to such odours through repeated exposure, or how much they were masked by the 'smellscape' of the city.[90] Back-to-back houses were slotted in amongst factories and workshops, slaughterhouses, tanners and markets, with some close to canal wharves where manure, nightsoil and market waste were deposited and all emitted their own bad smells.[91]

Again the ambiguity of linking smell to disease is evident in Hill's 1897 MOH annual report, when he discusses the town's diarrhoea epidemic that year.[92] Although privy pans are blamed, Hill does not expressly link smell to the cause but focuses very much on the lack of ventilation, and the 'stagnation of the atmosphere', which places Hill in the category of having a medical opinion that 'breathing a foul-smelling atmosphere might make individuals more susceptible to disease'.[93] However, Hill was also concerned with the lingering physical presence of filth, stating that 'the condition of courts and back-yards had an important bearing on the health of a person'. Overflowing pans and collection practices meant that the courtyards were filthy with

[88] Barnes, *Great Stink of Paris*, p. 17.
[89] National Trust, Birmingham Back to Backs on Inge Street, see their website at https://www.nationaltrust.org.uk/visit/birmingham-west-midlands/birmingham-back-to-backs [accessed 20 December 2023].
[90] For more on smellscape and the city, see Reinarz, *Past Scents*, pp. 177-208; Tullett, 'Re-Odorization, Disease and Emotion', p. 784.
[91] Luckin, *Death and Survival*, p. 94.
[92] A. Hill, *Annual Report on the Health of Birmingham for 1897* (Birmingham, 1898), p. 24; Tullett, 'Re-Odorization, Disease and Emotion', p. 785.
[93] Hill, *Report 1897,* p. 24.

areas soiled with human excreta which neither tenants, landlords or the council took responsibility for cleaning.[94]

All year the inhabitants of the back-to-backs had to endure inadequate provision, unhygienic conditions, constant smell and disturbed sleep from night-time collections, but warmer temperatures brought an additional nuisance and danger. The intensified smell of ashpits and privy pans attracted the 'summer plague' of flies.[95] Neil Davie states that 'the house-fly was an inescapable part of everyday life in Victorian England'.[96] Flies were considered a nuisance but were an accepted part of the summer months just like warmer temperatures. All homes were afflicted by flies, regardless of class or type of property, but for those living next to canals or in the overcrowded city centre and back-to-back houses the situation was considerably worse. In an appendix to Robert Rawlinson's 1849 report on Birmingham, the surgeon and sanitary inspector, Joseph Hodgson offered a sense of the problem when he wrote: 'depots of manure by the side of the canal […]. In the summertime swarms of flies, millions upon millions of flies, infest the houses in the neighbourhood'.[97] This was because the most favoured egg-laying site for flies was horse manure, but poorly managed waste was also conducive to breeding. There was little that people could do, other than try to follow the advice offered in newspapers to use eucalyptus oil or to soak lint or sponge in carbolic.[98] In the last quarter of the nineteenth century there were no public health warnings about the

[94] Hill, *Report 1897*, pp. 21-22.
[95] *BDP*, 5 August 1884.
[96] Davie, 'An Unbidden Guest', article abstract.
[97] A section of Hodgson's appendix from the 1849 Rawlinson Report reprinted in R. Watts and K. Booth (eds), Charles McKay, *The Morning Chronicle's Labour and the Poor: Vol IX Birmingham* (Ditto Books, no place of publication, 2020), p. 24. This publication is a reproduction of the 'Labour and the Poor' letters as printed in *The Morning Chronicle* in 1850.
[98] *BDP*, 5 August 1884.

dangers of flies for the simple reason that those dangers were not understood at that time (see Chapter Eight).[99] Every summer the plague of flies transmitted disease into shops, homes and kitchens, contaminating surfaces, food, utensils and even the faces of babies and young children. Oral history testimony reveals the early twentieth-century experience of living in a court in Aston: 'the toilets were big containers under the seat […]. Every week they were emptied by the nightsoil men and when they were due everyone closed their windows and bunged up any holes because the flies were everywhere'.[100]

In 1904 Dr James Niven, the MOH for Manchester, first drew attention to the problem of flies in the urban environment.[101] I. H. Buchanan in his study of infant feeding in colliery communities concludes that poor sanitation was a vital factor encouraging the impact of the house fly. Methods of waste disposal were particularly significant, be it a privy, ashpit or earth closet.[102] Nigel Morgan argues that the 'explosive growth in the population of horses in expanding towns was probably responsible for sustaining, or even enhancing, levels of infant mortality due to enteric diseases spread by flies bred in horse manure'.[103] Linda Davies additionally emphasises the importance of flies and the contribution of diarrhoea and enteritis to Infant Mortality Rates (IMR) in a

[99] Medical practitioners' understanding of flies as a vector of disease is discussed in more detail in Chapter Eight.
[100] A post by forum member Martial Jr recounting what their father told them about living in old Aston in the courts. Topic: Birmingham Back-to-Backs, *Birmingham History Forum*, posted 20 December 2008 https://birminghamhistory.co.uk/forum/index.php [accessed 21 March 2021].
[101] Niven is cited in J. Lewis, 'The Social History of Social Policy: Infant Welfare in Edwardian England', *Journal of Social Policy,* 9, 4 (1980), pp. 463-86, p. 467, f/n 20.
[102] I. H. Buchanan, 'Infant Feeding, Sanitation and Diarrhoea in Colliery Communities, 1880-1911' in D. J. Oddy and D. S. Miller (eds), *Diet and Health in Modern Britain* (1985), pp. 148-177.
[103] The horse population in Britain was 3.5 million in 1902, with each animal producing between six and seven tons of droppings annually. See F. M. L. Thompson, *Victorian England: The Horsedrawn Society* (1970) cited in Hardy, *Epidemic Streets*, p. 184; Morgan, 'Infant Mortality, Flies and Horses'; Davie, 'An Unbidden Guest', sections 9 and 10.

local study of Hemsworth in Yorkshire.[104] However, Davies concludes that the findings in Hemsworth could not fully support Morgan's claim that this was attributable to the increase in the number of horses.[105] However, Hemsworth's population was not comparable with Preston or Birmingham, as it had fewer people and horses.[106] Whereas, French and Warren's analysis of infant mortality in the Canbury area of Kingston upon Thames concluded 'the proximity of animals to living space' was significant due to the manure produced.[107] Most recently, James L. A. Webb has weighed in to reinforce the significance of flies and the transmission of intestinal disease from 'mountainous piles of horse manure' and urban cesspits and privies into homes.[108] A single complaint about Birmingham's nightsoil system in 1878 quotes volumes of 'thousands of tons' waiting at a single tip site and 'forty tons' at one canal-side wharf.[109] Conditions in Birmingham were perfect for perpetuating summer plagues of flies due to its huge population of horses, the storing of manure at canal wharves, and its waste management practices with the continuation of ashpits and overflowing privy pans in the courtyards.[110] There was also the common practice among fishmongers and other market traders of depositing waste at the

[104] Buchanan, 'Infant Feeding, Sanitation and Diarrhoea', pp. 148-177; L. M. Davies, 'The Conquest of Infant Mortality: The Case of Hemsworth, 1871-1911' (Unpublished PhD thesis, The Open University, 2007), p. 141.
[105] Davies, 'Infant Mortality, Hemsworth', pp. 141, 148.
[106] The population of Hemsworth in 1901 was just over 23,000; for comparison, Preston was almost 120,000 and in Birmingham it was over 522,00.
[107] C. French and J. Warren, 'Infant Mortality in the Canbury Area of Kingston Upon Thames, 1872–1911', *Continuity and Change,* 22, 2 (2007), pp. 253-78, p. 272.
[108] Webb Jr, *Guts of the Matter,* pp. 75-76.
[109] 'The Birmingham Nightsoil System', *BDP*, 8 August 1878.
[110] The council alone had 507 horses in 1900 and this rose to 751 in 1914; see Vince, *History of the Corporation IV*, p. 175.

wharves, for a fee, offering further ideal breeding sites and creating additional bad smells.[111]

Flies 'brought death' and countered any early improvements in urban sanitation.[112] Following the closing of polluted wells and with the improved quality of the piped supply, there was an understandable expectation to see a reduction in the death rates for Birmingham (see Appendix 3). However, this was not the case. There was an initial reduction between 1875 and 1879 with the overall death rate falling from 25.2 deaths per 1,000 individuals to 21.8, but for the six years 1879 to 1884 it remained constant with the average rate at 20.7: this coincided with the peak period for expansion of the pan system in the city. Death rates for individual localities are more useful because they show that densely populated wards had higher death rates than those which were less densely populated. St. Stephen's ward, which in 1885 had three wells left after many closures, registered an average death rate of 25.8 per 1,000 individuals for 1894-8 and 25.6 in 1899.[113] The impact on public health is further illustrated in the 1897 MOH report to the council. After an epidemic of diarrhoeal diseases which resulted in 1,444 deaths, Hill categorised the causes as 'climate, social or sanitation'. Under sanitation, a section was devoted to the pan system in the older courts of St. Bartholomew's and St. Stephen's wards. After visits to 500 houses where diarrhoea deaths had occurred, the pan system was in use in 300 cases.[114] Hill emphasised the overcrowding and shared facilities and suggested

[111] *Ibid*.; Davie, 'An Unbidden Guest', section 10. Market traders continued this practice even after trade waste was collected and either burnt or processed in line with the privy pan disposal techniques (Chapter 4). The practice was still referred to in the Health Committee Minutes, BAC, BCC/1/AR/1/1/22 - June 1901 - Oct 1902.
[112] Webb Jr, *Guts of the Matter,* pp. 75-76.
[113] Vince, *History of the Corporation III*, p. 128. The overall death rate for corresponding years was 19.82 and 20.5.
[114] Hill, *Report 1897*, pp. 4-8, 21-29.

reforms, including the collection of refuse in the day so that areas could be cleaned properly, and advised that the council should help with costs for full conversion to water-carriage.[115] The former suggestion about court cleansing was eventually actioned but the second suggestion was not.

Tables 6.3 and 6.4 draw together information from MOH reports and the Sanitary Survey of 1885 for the three worst areas with the highest death rates, to explore the impact of privy pans and ashpits. St. Stephen's ward, the most densely populated, had the fewest conveniences overall, with the smallest number of WCs and the highest number of ashpits. An analysis comparing density and the number of conveniences and type available to the population demonstrates that St. Stephen's had the highest ratio of people to closet at 10:1: a total of 2229 closets were available for a population of 23,500.[116] The wards of St. Mary's and St. Bartholomew's had ratios of people to closet of 7:1 and 6:1 respectively. These two wards (which had a higher number of pan privies) were also densely populated but to a lesser degree than St. Stephen's although they followed closely in terms of the average death rate. This demonstrates the negative impact of conservancy systems and the link with the number of people sharing a limited number of conveniences, as identified by Hill at the time, even though he did not fully understand how disease was spreading (Chapter Eight).

[115] *Ibid.*
[116] Closet here applies to all, WCs, ashpit privies and pan privies.

Ward	Est Pop. 1897	Est Pop. 1907	Average Death Rate 1894-97	Death rate 1902	Death rate 1907	Area in Acres (1907)	Persons per acre (1907)
St. Stephen's	23,500	23,275	26.6	26.5	21.2	169	167.3
St. Mary's	16,100	13,386	26.2	24.8	21.4	184	72.7
St. Bartholomew's	26,000	23,043	26.1	24.6	23.6	313	73.6

Table 6.3: Population, Average Death Rates and Density for Three Unhealthy Wards.

Ward	Wells	Water Closets	Pan Privies	Ashpit privies	Front and Back houses
St. Stephen's	7	162	1545	522	4512
St. Mary's	5	338	2067	308	4175
St. Bartholomew's	49	538	2937	420	5715

Table 6.4: Sanitary Survey of Wells and Closet Provision in 1885 for Three of the Unhealthiest Wards

The professional societies of medical practitioners were vocal in their condemnation of interception systems, regardless of why councils had felt the need to introduce them.[117] Despite the river pollution dilemma, water-carriage systems remained the preferred option of medical professionals.[118] Hill was initially supportive of introducing pans as an alternative to the ashpit, but by the end of the century he openly called for their removal.[119] Hill's son, Dr. Bostock Hill, followed his father into the profession

[117] *BDP*, 9 July 1881; Crook, *Governing Systems*, p. 183.
[118] For more on the river pollution dilemma in England, see L. Rosenthal, *The River Pollution Dilemma in Victorian England: Nuisance Law Versus Economic Efficiency* (Oxon, 2014).
[119] *The Lancet*, 16 July 1898.

and, at the 1898 annual branch meeting of the Society for Medical Officers of Health, derided the privy pan as the 'most disgusting and abominable system under heaven'. His major concerns related to insufficient disinfection and the spread of disease following the removal of pans from houses where contagious disease was known.[120] These concerns were not unfounded, considering the poor employee practices in Birmingham.

In the last quarter of the nineteenth century, councillors expected the municipalisation of the water supply and introduction of the privy pan to improve conditions, lessen river pollution, and reduce death rates; however, these benefits failed to materialise. Overall death rates for the city (Appendix 3) did not significantly start to fall until after 1905, a date which corresponds with the arrival of the new water supply and acceleration of conversion to WCs (see Table 6.3 and Fig. 6.6). While this supports the view that local government intervention in sanitary reform was an important contributor to the decline in mortality, in Birmingham this did not happen until the start of the twentieth century.[121] As Figure 6.6 shows, the death rates in the most densely populated central wards remained higher, following the general pattern that the poorest areas were the last to see a significant decline in death rates until better sanitation became more widespread.[122] However, as argued by Anne Hardy, there

[120] *BDP,* 4 January 1889; *Public Health*, May 1919, p. 86. Bostock Hill followed his father into the profession with a position at Warwickshire County Council.
[121] This supports the importance of sanitary reform and local government intervention (see Szreter's critique of McKeown, as discussed in Chapter One. T. McKeown, *The Modern Rise of Population* (London, 1976), pp. 160-3; S. Szreter, 'The Importance of Social Intervention in Britain's Mortality Decline c. 1850-1914: A Reinterpretation of the Role of Public Health', *Social History of Medicine*, 1 (1988), pp. 1-37.
[122] The 1904 MoH report for Birmingham included a report on the Floodgate Street Area which comprised St. Bartholomew's, St. Mary's and St. Stephen's wards (considered the unhealthiest wards). The mean death rates for the period 1899-1903 were St. Bartholomew's 26.0; St. Mary's 27.7; and St. Stephen's 25.4. J. Robertson, *Report of the Medical Officer of Health on the Health of the City of Birmingham for the year 1904* (Birmingham, 1905), p. 19; J. Robertson, *Report of the Medical Officer of Health on the Health of the City of Birmingham for the year 1907* (Birmingham, 1908), p. 7.

were different patterns for different diseases, indicating that sanitary reform was not the panacea for all disease and childhood mortality remained high.[123] 'Local preventative medicine' did not simply mean sanitary reform, it required slum clearance and education.[124]

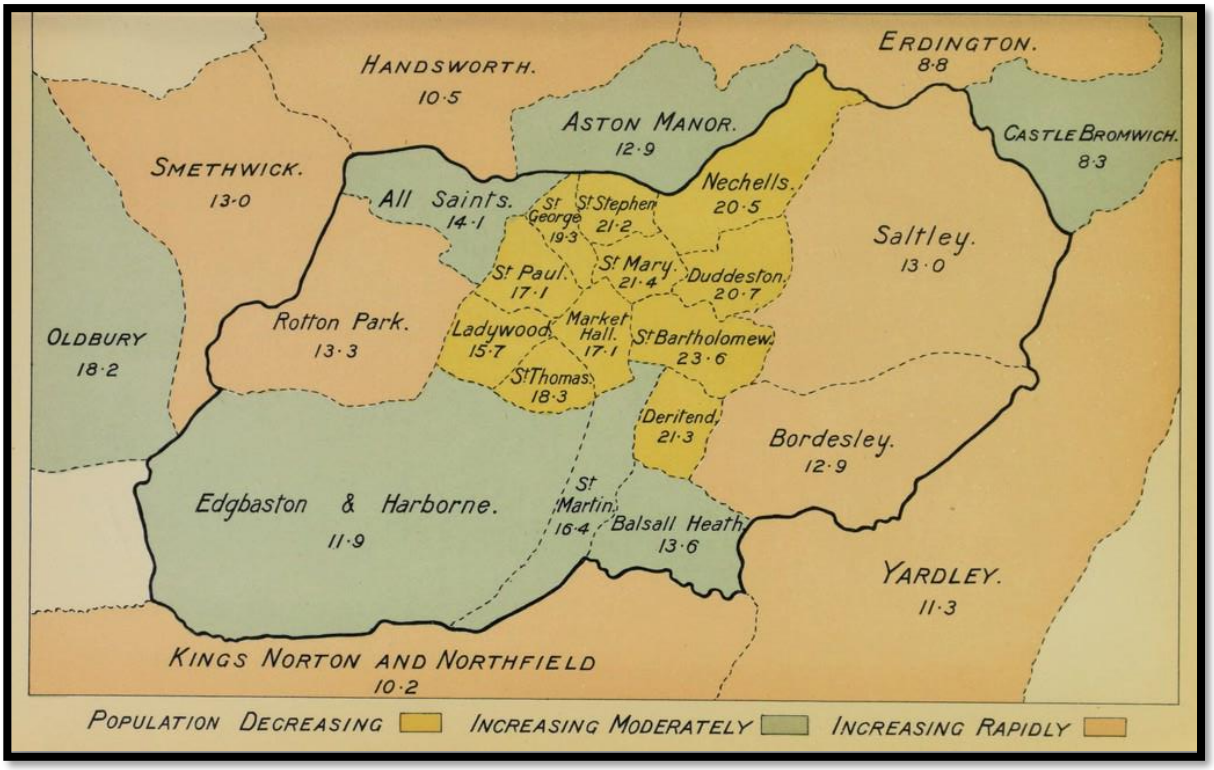


Figure 6.6: Map showing Birmingham Wards with Corresponding Death Rates for 1907.

[Report 1907]/Medical Officer of Health, Birmingham. Wellcome Collection. Attribution 4.0 International (CC BY 40).

The efficacy of the pan system was contested within its first decade of operation, particularly in 1884 when there were loud calls 'to make Birmingham a water-closet

[123] Hardy, *The Epidemic Streets*, pp. 267-294. The new MoH, Dr John Robertson, reported that the infant mortality rate in 1904 was 195 (based on deaths under 1 year per 1000 births), this was the same rate as in 1875. Robertson, *Report 1904*, p. 15. Infant mortality is discussed in Chapter Eight.
[124] Hardy, *Epidemic Streets*, pp. 267-294.

town'.[125] And yet the council resisted and persisted with the system. The considerable investment in disposal technology and infrastructure was one reason (Chapter Four), but as the next section reveals, the situation reached an impasse due to environmental factors.

Council Policy and Restricted Progress

Crook's discussion of debates about pail systems highlights the arguments made by local authority engineers about 'local circumstances', especially in respect to water supply and sewage works.[126] This section looks at why the council had no choice but to continue with its contested decision, even after revision of its policy and attempts to find alternative closet solutions.[127]

Amidst all the criticism and unpopularity, the council made a discreet policy change in 1886, without admitting to any failings. The Health Committee recommended WCs for any new or modified closets in the borough, where previously it had insisted on the pan privy.[128] This meant that the existing pan system in operation continued, but the system was not expanded any further. The council's decision was made after much debate in the council chamber where Avery, as chair of the Water Department, Drainage Board and former head of the Sewage Inquiry, was well placed to remind all councillors of the reasons why the interception system had been introduced in the first place. Although there had been improvements to the sewage treatment

[125] *BDP,* 21 June 1884.
[126] Crook*, Governing Systems*, pp. 182-183.
[127] Crook, *Governing Systems*, pp. 183-187.
[128] *BDP*, 4 August 1886. The council could not insist when it came to older buildings.

processes at Saltley, the works received sewage from other districts. If the largest member of the joint drainage board converted fully to WCs, the works would be stretched beyond its capabilities and Birmingham council would again face litigation over river pollution. Avery continued that to convert to WCs also required an abundant water supply at a time when a consistent supply for the town and surrounding districts was a struggle. To achieve such a conversion, the waters of the River Tame would have to be utilised, necessitating a separate piped supply from drinking water, which Avery estimated would cost a quarter of a million pounds.[129] Avery pointed out that in addition to extra rates and water charges to cover those costs, ratepaying property owners would also be burdened with the costs of another closet conversion.[130] After many property owners were coerced to change to pan privies at the council's insistence, this would have meant an embarrassing U-turn. Therefore, the council's only viable option was to operate a policy of a very gradual conversion to full water-carriage as the water supply and treatment capacity along the Tame Valley expanded. Continued environmental pollution, almost twenty years after the sewage crisis, meant that those using pan privies were sentenced to endure a sanitation nightmare not of their choosing, even before the interception scandal and enquiry came to light. The same argument was made again in 1901 in a Health Committee report to the council answering to criticisms after a series of articles, *Scenes in Slum Land,* were published by the *Birmingham Daily Gazette.*[131] This

[129] *BDP*, 21 June 1884. This would have involved another set of mains and pipes to deliver a non-domestic supply as the Tame was prohibited from being used as domestic supply from 1871.
[130] *BDP*, 21 June 1884.
[131] *Birmingham Daily Gazette* investigated the conditions in Birmingham's slums. In 1901 it published a series of articles, *Scenes in Slum Land*, which detailed the dreadful living conditions and accused the chair of the Health Committee, Alderman Cook, of being 'a slum landlord'. Cook sued for personal damages and won a small payout. The Health Committee produced a report answering some of the key issues raised at this time when a deputation of clergy chaired by the Bishop of Worcester urged the council to enquire into and act over the

situation demonstrated the need for a new water supply and yet it was never used as an argument for getting the water scheme passed in 1892. The fear of legal action over river pollution was a major influence on municipal policy over the conversion to water-carriage at that time.

With the situation at an impasse, the scandal over interception motivated Hill to find a workable alternative to the pan privy in order to prevent deaths.[132] Keen to see water-carriage systems prevail, Hill suggested 'slop-closets', an experimental system in Nottingham that used wastewater.[133] This system required some adaptation of the drains from sinks to provide wastewater for flushing via a 'tipping basin' technology (see Fig. 6.7). Again, on paper, this appeared to be the perfect solution for Birmingham, as it intermittently flushed contents into the sewer system but crucially did not require a separate cistern linked to mains water supply. There were no extra water charges for cisterns nor any additional strain on supply. A number of these closets were installed, presumably at the property owners' cost, and Hill continued to champion them for three or four years but by 1897 they were no longer mentioned. They did not become the preferred choice in Birmingham, most likely due to defective 'toiletry technologies' in the crowded urban environment; they needed constant repair.[134] In the end, the costs of adapting sinks and the high maintenance deterred property owners from adopting the system.

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sanitary state of the poorer parts of the city. BAC, BCC/1/AR/1/1/22, Minutes of the Health Committee, June 1901 - Oct 1902; BAC LF41.8 / 156671, J. C. Walters, *Scenes in Slum Land*, *Pen Pictures of the Black Spots in Birmingham*, 2 volumes (Birmingham, 1901).

[132] At this point the scheme for water from the Elan Valley had not yet been proposed.

[133] A. Hill, *Report on the Health of the Borough of Birmingham for the year 1886* (Birmingham, 1887), pp. 45-47; for greater detail on wastewater closets, see H. Jones, 'Slop Closets', *Public Health, 8 (1895), pp. 362-365.*

[134] In 1897 Hill reported that there were just over 8,000 ashpits in the city (768 had been converted to WCs that year). He also reported that just over 30,000 pan privies were in use, with only 105 being converted that year. A. Hill, *Report 1897*, p. 33; Crook, *Governing Systems*, pp. 185-187.

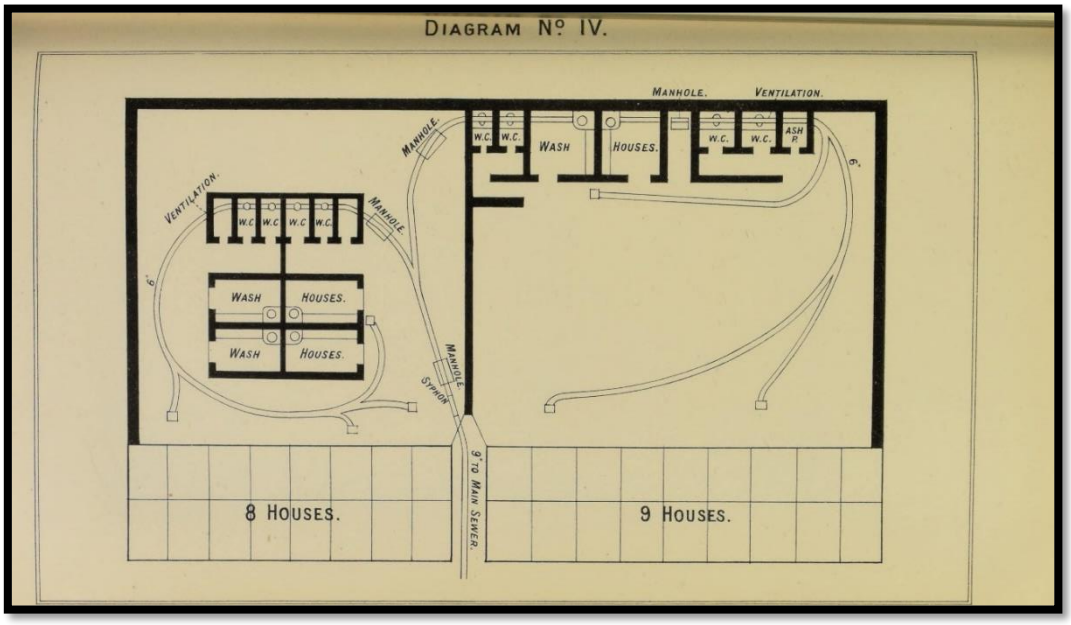


Figure 6.7: Diagram of Proposed Waste-Water Closet System for Court Housing in Birmingham 1890.

[Report 1890]/Medical Officer of Health, Birmingham. Wellcome Collection. Attribution 4.0 International (CC BY 40).

By 1902, when councillors were agreed that the pan privy should be dispensed with, the Health Committee was discussing what type of closet would best replace the pan privy.[135] Some property owners considered the trough closet as an alternative but upon application to the Water Department, permission was swiftly denied unless a meter was attached to measure how much water was being used.[136] Council deputations were sent to Sheffield and Leeds to investigate their closet provision, and the council made the decision that WC conversions were best served by an 'isolated pedestal closet with a two-gallon symphonic action cistern' as this was considered 'more cleanly, less wasteful and would enable […] to fix the responsibility on the

[135] An example of a trough closet used in Liverpool can be found in the BAC, *Report of the Sewage Inquiry Committee*, Plate II.
[136] BAC, BCC/1/AR/1/1/22, Minutes of the Health Committee - June 1901 - Oct 1902, 23 June 1902.

user'.[137] This raises the question as to who paid for the conversion to WCs and whether there was any evidence of council assistance. Council minutes reveal that once a nuisance order stipulated that a conversion was necessary, the Health Committee authorised and performed the work; however, this was totally chargeable to the property owner. There is evidence of credit arrangements, with owners making a downpayment with a promise to pay the balance within twelve months. The council set a rate of 5 percent interest on the outstanding amount for each year it remained unpaid.[138] After the deliberate discouragement of WCs followed by a policy of gradual conversion after 1887, half of the houses in Birmingham had a WC by 1901, with a similar situation in Manchester by 1911.[139] After 1903 conversions to WCs gathered pace, with the new water supply from Wales and advancements in sewage treatment. It was only at this point that the council openly declared an 'abolition' policy for the pan privy.[140] The conversions still took time and even when WCs became commonplace in the courtyards, they remained a shared convenience. An example of courtyard sanitation improvements can be seen in Appendix 9 in a 1915 block plan for houses in St George's Street. The improvements included new sinks with drains for houses and brewhouses and new WCs.[141]

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[137] *Ibid.*

[138] BAC, BCC/1/AR/1/1/23, Health Committee Minutes - 1902-1904.

[139] Vince, *History of the Corporation IV*, pp. 127-161; Wohl, *Endangered Lives*, p. 108.

[140] In 1902, 871 pan privies were converted to WCs and in 1903, 2,892 pan and ashpit privies were replaced by WCs. BAC, BCC/1/AR/1/1/23, Health Committee Minutes - 1902-1904; BAC, BCC1/AR/3/1/7, Interception Sub-Committee Minutes, 1904-1910; Vince, *History of the Corporation IV*, p. 177.

[141] BAC, BCC/1/AM/D/1/3/1/542: this block plan dated 1915 was found amongst Birmingham City Council Town Clerk's Deeds bundles. It shows houses at 25-29 St George's Street and houses numbered 1 – 9, including ash bins, washhouses and drainage. Gratitude is expressed to the archivists at Birmingham Archives and Collections for highlighting the existence of this plan to author.



Figure 6.8: Photograph of Privies in a Court in Bagot Street, Birmingham, 1904.

Reproduced with permission of Library of Birmingham, WPS/WK/B11/1609. Clearly there was a WC in the centre privy but not in the far right, demonstrating the slow transition.

Conclusions

The courtyard experience has shown that there was improved quality of water with the transition from well to tap, which may have reduced water-borne disease. However, this potential benefit was cancelled out by the bad living environment of the courtyard. Coupled with existing urban pollution of smoke and noxious trades, the smell, noise and unhygienic conditions of ashpits and pan privies meant a poor quality of life for inhabitants. Every summer the situation worsened with an even greater danger to health posed by flies. The decision to adopt the pan privy conservancy system was made in the wake of the town's sewage crisis – a decision initially made in good faith to reduce river pollution and rid the town of ashpits.

However, this course was proposed before the municipalisation of the water supply and before the formation of the joint drainage board. Subsequently, the fear of further litigation and the added burden of other districts' waste at Saltley (Chapter Four), combined with the struggle to meet the demand for water (Chapter Five), prolonged the policy of discouraging WCs. Even when pan system failings eventually forced a policy change in 1886, people living in the older housing stock were left at the mercy of the closet dilemma for decades. Environmental, legal and local government factors, coupled with landlord resistance to water charges and ineffective toilet technology, conspired to impact the lives and health of inhabitants who were powerless to change their own situation, thus prolonging their sanitation misery.[142]

The council failed to achieve its objective of improving the health of the inhabitants of the unhealthy areas during this period. The persistent high death rates in densely populated central wards demonstrated the importance of proper sanitation; this finding supports the views of Szreter, Hardy and others whose arguments run contrary to the conclusions reached by Thomas McKeown (see Chapter One). However, the eventual improvement in Birmingham's death rates did not occur within the period linked by Szreter to loans on sanitary projects from central government.[143] After 1904 Birmingham council reached the point where it had the means to effectively improve sanitation throughout the city, but this took time to filter through to the oldest courts where the poorest people lived. Even then, with an internal tap and communal WCs, the situation was far from ideal as the housing stock and living

[142] Environmental, legal and local government factors included inadequate water supply; the threat of legal action for river pollution; council policy discouraging WCs and lack of power as a Sanitary Authority.
[143] McKeown, *Modern Rise of Population*, pp. 160-3; Szreter, 'The Importance of Social Intervention', pp. 1-37.

environment was so poor in urban slums surrounded by industry. [144] The experience in Birmingham demonstrates what Aidt *et al.* suggest may explain the 'late persistence of high rates of diahorrea', even though water-borne diseases had declined.[145] The 1897 MoH report offers a sense of Dr Alfred Hill's despondency that death rates had remained unchanged and that the diarrhoea epidemic was evidently perpetuated by the pan system, as well as his frustration at the council's failure to remove slum housing and build new 'healthy' homes.[146] Hill suggested to the council that a sanitary authority was powerless to 'alter climatic conditions […] improve social habits; but all insanitary conditions it can and should remedy'.[147] In the absence of a viable municipal social housing policy, public health practitioners, such as Hill in Birmingham, had little choice but to rely on the tools described by Dorothy Porter as 'crude sanitarianism' (see Chapter Eight).[148] As the old century ended, many inhabitants of back-to-back houses in Birmingham still lived with nuisances but they experienced greater council intervention in the form of court cleansers and daytime refuse collections to improve hygiene.[149] The new century also brought a move towards more health- and welfare-orientated public services, forcing interaction with a growing cohort of professional public health workers.[150] As the city's boundaries

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[144] Hardy, *The Epidemic Streets*, pp. 267-294; Luckin, *Death and Survival*, p. 95.
[145] T. S. Aidt, R. J. Davenport and F. Gray, 'New Perspectives on the Contribution of Sanitary Investments to Mortality Decline in English Cities, 1845–1909', *The Economic History Review,* 76, 2 (2023), pp. 624-660, p. 657.
[146] Hill, *Report 1897*, p. 25.
[147] Hill, *Report 1897*, p. 24.
[148] Porter defines 'crude sanitarianism' as being focused on drains, sewers and nuisances. D. Porter, *Health, Civilization and the State: A History of Public Health from Ancient to Modern Times* (London and New York, 1999), p. 140.
[149] In 1901 a court cleansers section employed a foreman and 15 cleaners who cleansed courts, washed and deodorised pan privies and cleansed drains. More yards were paved or repaired, and the department employed 138 ashmen. BAC, BCC/1/AR/1/1/22, Minutes of the Health Committee - June 1901 - Oct 1902
[150] Porter, *Health, Civilization and the State,* p. 80; A. Mold, P. Clark, G. Millward, and D. Payling. 'The Public and Public Health' in A. Mold, P. Clark, G. Millward and D. Payling (eds), *Placing the Public in Public Health in Post-War Britain, 1948–2012* (Cham, 2019), pp. 7-32, p. 7.

and population expanded, the next chapter explores this shift and engages more closely with the citizens who worked in the council's public health department.

Chapter Seven

Professional Rise and Fall in Municipal Public Health, 1870s-1920s

Virginia Berridge argues that at the turn of the century with the rise of bacteriology, a 'new style of public health' moved away from improvement of the environment towards the role of the individual and, in particular, the mother and the home.[1] In Dorothy Porter's words, the early twentieth century marked the start of 'the maternalist state'.[2] This change was not sudden, however, as public health from the 1870s had involved the increasing regulation of life at home and at work.[3] This shift towards welfare and education offered women more employment opportunities and saw health and social services develop as a female specialism.[4] Examination of how a large municipal public health department developed helps to analyse this shift and one research question is to explore to what extent this new style began to be translated into practice in Birmingham. Council records and other sources for the city allow examination of this development as obligations increased, looking at the number of employees, roles and council expenditure. Birmingham's Health Committee, later renamed the Public Health Department, grew to include many different roles for both men and women between the 1870s and 1920s.[5] The staff of

[1] V. Berridge, *Public Health: A Very Short Introduction* (Oxford, 2016), p. 57.
[2] D. Porter, *Health, Civilisation and the State: A History of Public Health from Ancient to Modern Times* (London and New York, 1999), p. 183.
[3] C. Hamlin, 'The History and Development of Public Health in Developed Countries', in R. Detels, M. Gulliford, Q. A. Karim and C. Chuan Tan (eds), *Oxford Textbook of Global Public Health,* 6th Edition (Oxford, 2015), p. 28.
[4] Porter, *Health, Civilisation and the State*, p. 182.
[5] The Health Committee (1876-1911) was renamed Public Health Department in 1911 and its responsibilities were reorganised.

the municipal hospitals also fell within the remit of this department,[6] but there was a clear segregation, administratively and financially, between the city's medical institutions and the sanitary section.

This period also saw increasing professionalisation of all public health roles through increased training and the raising of qualifications. As Harold Perkin explains, 'an increasingly professional society' consists of 'career hierarchies' of specialist occupations based on 'trained expertise' to 'the exclusion of the unqualified'.[7] The theme of professionalisation is explored throughout this chapter and assesses the evidence for what Perkin describes as 'the class conflict of the late Victorian and Edwardian period' with the 'struggle for income, status and power'. Perkin argues that 'the fourth class', the professional class, contributed to these class struggles but also provided the means to resolve it.[8] Previous chapters have explored some workers' roles but the focus here is on the gendered roles of sanitary inspection and health visiting. As a later addition to public health work, the health visitor role developed out of the need to tackle infant mortality, which remained extremely high at the start of the twentieth century.[9] The origins of the health visitor role lay in the mid-nineteenth-century charitable societies for home visiting and 'health missionary' work, giving lectures to women.[10] The founding of the Ladies' Sanitary Association of

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[6] The Borough Hospital for infectious diseases (chiefly for smallpox and scarlet fever) was opened at Winson Green in 1874; J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885), pp. 102-104.
[7] H. Perkin, *The Rise of Professional Society: England since 1880* (London and New York, 1990), p. 2.
[8] Perkin, *The Rise of Professional Society*, pp. 9, 116-117.
[9] Dr John Robertson reported that the infant mortality rate for Birmingham in 1904 was 195 (based on deaths under 1 year per 1000 births); J. Robertson, *Report of the Medical Officer of Health on the Health of the City of Birmingham for the year 1904* (Birmingham, 1905). For more general information on mortality rates in the UK, see C. Dyehouse, 'Working-Class Mothers and Infant Mortality in England, 1895-1914', *Journal of Social History*, 12, 2 (1978), pp. 248-267; R. Millward and F. Bell. 'Infant Mortality in Victorian Britain: The Mother as Medium', *Economic History Review,* 54, 4 (2001), pp. 699 – 733.
[10] D. Porter, *Health Civilisation and the State,* p. 179. A more detailed historiography on social intervention and the role of health visiting is explored in Chapter Eight.

Manchester and Salford in 1862 inspired Birmingham's own Ladies' Association for Useful Work in 1876.[11] Ruth Procter has explored health visiting and Infant Welfare Centres in Birmingham, both municipal and voluntary, and has informed this study in respect to the provision of voluntary services.[12]

Others have explored the development and professionalisation of sanitary inspectors and health visitors. Tom Crook examines sanitary inspection in Britain as a 'case study in liberal governance', reviewing politics and ethics within a local and central context of the broad shift from '*laissez-faire'* to the 'interventionist state'.[13] Christopher Hamlin focuses on the inspection of nuisances and the inspectors' role within the local community they served.[14] Hamlin and Crook both highlight the importance of interpersonal skills for this role and the status of an officer as an extension of state intervention. Peter Brimblecombe specifically traces the development of the post of Inspector of Nuisances (ION) and, like Crook, surveys the role of women in sanitary inspection and the struggles over status, professionalisation and qualification standards for both inspection and visiting posts.[15] Norman Parkinson also explores the process and struggles of

[11] Birmingham Archives and Collections, Library of Birmingham (BAC), L46 141567, Ladies' Association for Useful Work (Annual Reports) 1876-1903; R. W. J. Dingwall, 'Collectivism, Regionalism and Feminism: Health Visiting and British Social Policy 1850–1975', *Journal of Social Policy,* 6, 3 (1977), pp. 291-315; Porter, *Health Civilisation and the State*, p. 179. For more detail about the Manchester association, see V. Heggie, 'Health Visiting and District Nursing in Victorian Manchester; Divergent and Convergent Vocations', *Women's History Review,* 20, 3 (2011), pp. 403-422.
[12] R. J. Procter, 'Infant Mortality: A Study of the Impact of Social Intervention in Birmingham 1873 to 1938', (Unpublished MPhil Thesis, University of Birmingham, 2011).
[13] T. Crook, 'Sanitary Inspection and the Public Sphere in Late Victorian and Edwardian Britain: A Case Study in Liberal Governance', *Social History,* 32, 4 (2007), pp. 369-393, p. 369.
[14] C. Hamlin, 'Nuisances and Community in Mid-Victorian England: The Attractions of Inspection', *Social History,* 38, 3 (2013), pp. 346-379.
[15] Hamlin, 'Nusiances and Community'; P. Brimblecombe, 'Historical Perspectives on Health: The Emergence of the Sanitary Inspector in Victorian Britain', *Journal of the Royal Society for the Promotion of Health,* 123, 2 (2003), pp. 124-131.

professionalisation in the face of Medical Officer of Health (MOH) dominance and local authorities' efforts to keep status and therefore pay low.[16] Male Medical Officers of Health (MOHs) and councillors were driven by the idea that women visitors were best placed, through their inherent female qualities, to communicate with other women about the domestic space and childcare.[17] However, as Vanessa Heggie points out in her Manchester study, this justification has its problems.[18] The findings for Birmingham support Heggie's view since most of the city's health visitors were unmarried women with no personal experience of pregnancy or childcare. Despite its late entry into public health, the professionalisation of health visiting progressed rapidly in the first decades of the twentieth century, due in part as Celia Davies argues, to a 'struggle between the sexes' about their contribution to public health work. It took place within a context of conflict between male and female sanitary inspectors, breaking the boundaries of 'separate spheres for the sexes' and pay inequality.[19]

What follows contributes new knowledge to the existing historiography and offers a distinctive contribution by looking specifically at the professional experiences of individual male and female workers within Birmingham's sanitary section. A local archives project introduced Blanche Gardiner (1868-1953), Superintendent of Health Visitors in Birmingham, as a person of interest to the author for further research.[20]

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[16] N. Parkinson, '"Inspector of Nuisances" to "Environmental Health Practitioner": A Case Study of Title Change in the Professionalisation Process', *Journal of Environmental Health Research*, 15, 1 (2015), pp. 4-22.
[17] C. Davies, 'The Health Visitor as Mother's Friend: A Woman's Place in Public Health, 1900-14', *Social History of Medicine*, 1, 1 (1988), pp. 39-59; J. R. Haynes, 'Sanitary Ladies and Friendly Visitors: Women Public Health Officers in London, 1890-1930', (Unpublished PhD Thesis, University of London, 2006); Crook, 'Sanitary Inspection'; Heggie, 'Health Visiting and District Nursing', pp. 403-422.
[18] Heggie, 'Health Visiting and District Nursing', p. 404.
[19] Davies, 'The Health Visitor as Mother's Friend', pp. 39, 41, 47.
[20] Friends of Birmingham Archives and Heritage (FoBAH), *Born in Birmingham: Maternity, Midwives and Infant Welfare 1914-1924*, (Birmingham, 2021). This is the output of a local project supported by a National Lottery

Although no personal papers were found, Gardiner appeared in various sources and, as an active member of women's associations, she presented papers at conferences and campaigned for equality over status and pay.[21] Scrutiny of Gardiner and other female individuals who worked as health visitors in Birmingham illuminates what Davies refers to as the place of both working-class and middle-class women in public health.[22] Council records have provided the names of other women, some of whom, can be traced in national census records and Appendix 10 offers more information on those employed as health visitors in the first decades of the twentieth century.[23] Another key source, which to the author's knowledge has never been used before, is a typescript memoir of a Birmingham sanitary inspector. Hay McDonald (known as Mac) produced this in 1943 after his retirement from almost fifty years' service with Birmingham council and it is a valuable contemporary source where there is precious little other information on the work of a sanitary inspector.[24] Whereas Perkin describes the rise of the professional society, McDonald traces the 'rise and fall of the sanitary inspector' in his memoir.[25] Looking at these individual experiences provides insight into the relationships between gender, class and profession.[26]

Heritage Fund First World War: then and now grant (2019-2020). Volunteers and FoBAH committee members used collections held at BAC and produced a learning guide for researching maternity services and infant welfare issues in Birmingham 1914-1924. J. Wright, 'Miss Blanche Gardiner – Superintendent of Health Visitors', *Born in Birmingham 1914-24* [Blog posted 22 December 2019] available at https://borninbirmingham.home.blog/2019/12/22/miss-blanche-gardiner-superintendent-of-health-visitors/ [accessed 17January 2022]; FoBAH, 'Blanche Gardiner' (1868-1953), *Born in Birmingham*, p. 29

[21] B. Gardiner, 'The Woman's Part in the Cause and Prevention of Pulmonary Tuberculosis', *Journal of the Royal Sanitary Institute (JRSI)*, 25, 3 (1904), pp. 884-889; B. Gardiner, 'The Varied Nature of the Work of Women Public Health Officials', *JRSI*, 35, 11 (1914), pp. 511-517.

[22] Davies, 'The Health Visitor as Mother's Friend', pp. 39, 41, 47.

[23] BAC, Birmingham City Council Collection, BCC1/AR/D/1/5/2/1, Sanitary Department Wages Book 1904-5; BCC1/BM/D/1/5/2/6 Child Welfare Wages Book 1918.

[24] BAC, L 45 541411, H. McDonald, 'Municipal Service for Half a Century: Autobiography of a Sanitary Inspector (of the City of Birmingham Public Health Department)', typescript (1943).

[25] Perkin, *Rise of Professional Society*; McDonald, 'Municipal Service'.

[26] Heggie, 'Health Visiting and District Nursing', p. 404.

The chapter begins by exploring the development of municipal public health in Birmingham, with particular focus on the sanitary section. From its origins in borough inspection and nuisance, through the more sanitary interventionist period of 1872-1920 with its shift from the environmental and sanitarian model to education and welfare of the individual. It then turns to look more closely at professionalisation through the gendered posts of sanitary inspector and health visitor and the experiences of some of the city's public health workers. Finally, it considers insights that the expansion of municipal public health in Birmingham can offer into the changing focus of public health in the early twentieth century and what workers' experiences can tell us about how class and gender interacted in the professionalisation of public health.

Municipal Public Health

This section looks at the development of the council's department with a focus on the sanitary division. It explores some of the key roles and the level of staffing as boundaries and population increased. It seeks to establish to what extent there was a shift to the new style of public health and a definite turn away from the environmental and sanitarian model (continued in Chapter Eight).[27] At the same time, it examines what key roles can tell us about professionalisation, status and class struggles during the period.

[27] Berridge, *Public Health*, p. 60.

From Borough Inspection to Sanitary Intervention

As Anne Hardy points out in her examination of London's MOHs, there were no medical careers in public health before 1846.[28] The Town Improvement Clauses Act of 1847 and the Public Health Act (PHA) of 1848 gave powers to local authorities to establish Local Boards of Health with two key public health officials, the MOH and ION.[29] Each role had set duties and powers, but not equal status due to differences in education and qualifications. The MOH was a medically trained male professional: focusing particularly on the physical environment, these men reported on sanitary conditions in their respective districts.[30] The activity of the ION, a non-professional role centring around the inspection of the physical environment, is described by Hamlin as 'the bottom layer of local public health administration'.[31] These early Acts of the 1840s were not compulsory and there was adaptation with some local authorities opting for one officer, while others had one individual perform both jobs. In Birmingham, when the council took over responsibilities from the Street Commissioners in 1852, there was an ION and an honorary medical officer, who resigned very soon afterwards.[32] From 1860, the first Adulteration of Foods and Drugs Act compelled the engagement of a professional public analyst. The analyst had to have 'competent medical, chemical and microscopial knowledge' to analyse

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[28] A. Hardy, 'Public Health and the Expert: The London Medical Officers of Health, 1856-1900', in R. MacLeod, *Government and Expertise: Specialists, Administrators and Professionals, 1860-1919* (Cambridge, 1988), pp. 128-142, p. 129.
[29] Brimblecombe, 'Historical Perspectives on Health', p. 125. See Appendix 1: Index of Persons, for more information about Birmingham's Medical Officers of Health (MOHs) and Inspectors of Nuisances (IONs).
[30] M. Gorsky, 'Local Leadership in Public Health: The Role of the Medical Officer of Health in Britain, 1872-1974', *Journal of Epidemiology and Community Health,* 61, 6 (2007), pp. 468-472, p. 469.
[31] Hamlin, 'Nuisances and Community', p. 347.
[32] J. Postgate, *Lethal Lozenges and Tainted Tea: John Postgate and the Crusade for Safe Food* (Studley, 2001), pp. 35-57; J. M. Brian, 'The Local Implementation of the Sale of Food & Drugs Act 1875' (Unpublished PhD Thesis, The Open University, 2006), pp. 66-69, 73.

food and drugs, and individuals from Birmingham had been instrumental in bringing about the passing of this Act.[33] Reporting to their local authority employers, these officials were at the head of public health workforces around the country. Marjaana Niemi suggests that ratepayers and councillors in Birmingham believed that an MOH was 'a luxury' Birmingham 'could not afford' and the council did not follow the lead of Liverpool and London, when they appointed an MOH in 1846 and 1848 respectively.[34] The costs of engaging a medical professional were obviously a deterrent and for this reason appointing an MOH continued to be fiercely resisted by the dominant Economist element of Birmingham's council. In 1867, local resident Thomas Plant appealed in a letter to a local newspaper for the matter to come before the council again. Plant described the city as being 'like a ship without a captain or pilot. We have no sanitary leader'.[35] The council argued that the job was already being performed by the ION and the Borough Analyst.[36] The city's analyst was Dr Alfred Hill, who twelve years later would become Birmingham's first MOH, when the council was finally compelled to appoint one by the 1872 PHA.[37] It is perhaps understandable that councillors resisted as their analyst was a medically trained professional and it was not a full-time exclusive post, which kept costs to a minimum and still complied with obligations. Surprisingly, when the opportunity for salary assistance from the Local Government Board came with the 1872 PHA, the majority vote of the council rejected the government grant, perhaps fearful of central

[33] Birmingham surgeon, John Postgate and the Liberal MP for the borough, William Scholefield. Postgate, *Lethal Lozenges and Tainted Tea*, pp. 35-57; Brian, 'The Local Implementation of the Sale of Food & Drugs', pp. 66-69, 73.
[34] M. Niemi, 'Public Health Discourses in Birmingham and Gothenburg 1890-1920' in S. Sheard and H. Power (eds), *Body and City: Histories of Urban Public Health* (Aldershot, 2000), pp. 123-142, p. 127.
[35] *Aris's Birmingham Gazette*, 21 September 1867.
[36] Birmingham's first ION was James Bliss, see Appendix 1: Index of Persons.
[37] Porter, *Health Civilisation and the State',* pp. 77, 127, 135.

interference. However, after the 1875 PHA brought greater obligations, Hill took on the role of MOH on a full-time basis, relinquishing his former commitments for a salary of £1000 per annum, supported by the government grant.[38]

The 1872 PHA also made the council an Urban Sanitary Authority and at that point the sanitary workforce totalled thirteen, with eleven male inspectors, the ION and MOH.[39] For a population of just over 350,000 this equated to a ratio of one inspector to 30,000 people. At that point Birmingham had fallen behind other large towns in the provision of public services. Leeds and Bristol had much lower ratios, but Manchester had the highest number of inspectors with a ratio of one to 8,000 people.[40] After the passing of the 1875 PHA, and as a result of the council's own sanitary census, committees were reorganised and received mandates for their new responsibilities.[41] In 1876 the number of Birmingham's sanitary inspectors increased to sixteen, giving one for each ward,[42] and dedicated inspectors were added for smoke, lodging houses and the removal of infectious patients. Additional staff were also employed for whitewashing and the new disinfecting station, located in Bacchus Road. Disinfecting stations were a key strategy used by some authorities to stop the spread of infectious disease; they subjected bedding and clothing to extremely high temperatures, generated by the new steam-powered machines designed especially for the purpose. Graham Mooney has explored this in greater detail using Birmingham as a case

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[38] Bunce, *History of the Corporation II*, pp. 96-97; Porter, *Health Civilisation and the State,* pp. 77, 103, 126, 127, 135.

[39] At this point the council's Borough Inspection Committee became the Sanitary Committee.

[40] In Leeds it was one to 13,000 and in Bristol it was one to 12,000; see Bunce, *History of the Corporation II*, pp. 96-99. At this point, nightsoil was still the responsibility of the Public Works Committee.

[41] In 1876 the Sanitary Committee was renamed the Health Committee and its mandate increased with the addition of the town's waste management. In 1911 the Health Committee was again renamed to become the Public Health Committee and due to the Greater Birmingham Act it absorbed many of the surrounding districts' medical institutions.

[42] This altered the ratio in Birmingham to approximately one sanitary inspector for every 20,000 people.

study.[43] The responsibility for nightsoil and interception systems was added from 1876, and the first female health visitors were introduced in 1899.[44] By 1901 a total of 657 workers, including those working at hospitals, were recorded as employed by the Health Committee, with a sanitary subdivision of thirty sanitary inspectors, eight health visitors, fifteen court cleansers, 109 pan collectors, 138 ashmen and seventeen clerks.[45]

This expansion had been driven by national legislation and local initiatives and municipal public health continued to expand over the first two decades of the twentieth century. A useful source *A Handbook for Birmingham and the Neighbourhood* (1913*)* helpfully outlines the full extent of the department at that time (see Table 7.1)*.*[46] It offers a good picture of how a public health department for a large municipality was staffed at that time, detailing the type of roles and the public work encompassed. It shows that the nursing and domestic staff of the council hospitals and new sanatoria formed the largest proportion of the Birmingham's Public Health Department, but the sanitary section also expanded considerably, not merely in respect to the number of employees but also the number of roles. Departmental

[43] Bunce, *History of the Corporation II*, p. 101. See also Chapter 5, 'Disinfection, Domestic Space and the Laboratory' in G. Mooney, *Intrusive Interventions: Public Health, Domestic Space, and Infectious Disease Surveillance in England, 1840-1914* (Rochester, 2015), pp. 121-153. Mooney examined the number of articles disinfected in Birmingham and Nottingham, taking data from the MOH Annual reports. Graphs showing the number of articles disinfected in Birmingham and reports of infectious disease and the number of houses disinfected between 1876-1900 can be found on pp. 130 and 144.

[44] C. A. Vince, *History of the Corporation of Birmingham, Vol. III* (Birmingham, 1902), p. 414.

[45] BAC, BCC1/AR/1/1/22 – Health Committee Minutes, June 1901 - Oct 1902, Report for Council Meeting 30 July 1901 (printed report pasted inside minute book). The report was produced to answer criticisms after the *Scenes in Slum Land* articles and a deputation of clergy was received by the Lord Mayor and urged enquiry and action to the sanitary state of the poorer parts of the city.

[46] G. A. Auden (ed.), *A Handbook for Birmingham and the Neighbourhood* (Birmingham, 1913), pp. 167-169. The editor, George Augustus Auden, was Birmingham's first School Medical Officer from 1908 and Professor of Public Health at University of Birmingham. The schools' medical inspection team were not part of the Public Health Department; they were under the authority of the Education Committee. See C. A. Vince, *History of the Corporation of Birmingham, Vol. IV* (Birmingham, 1923), pp. 315-320.

changes and the introduction of new roles had tended to follow key events or personnel changes. A significant point was reached in 1904 with the arrival of the city's new MOH, Dr John Robertson, who reorganised and introduced the assistant MOH position. A second major change occurred after the 1911 boundary extensions which meant that the Public Health Department was no longer responsible for interception and nightsoil.[47]

A total of 492 employees were directly employed by the department (Table 7.1) but some services, like bacteriological analyses and water examinations, were outsourced to the University of Birmingham. The contribution of groups employed by other council committees is also noted, for example: the Veterinary Superintendent and his three assistants devoted part of their time to public health even though they were employed by the Stables and Lighting Department. Similarly, eight inspectors were employed by the Markets and Fairs Committee for meat inspection, but they acted on behalf of public health.[48] This demonstrates that everything connected with public health could not be neatly subsumed into a single committee, the make-up of which changed over time. However, other separate departments were also integral to public health, such as waste management, sewer building, water supply and the school medical service, so the municipal workforce involved in supporting the citizens' health was far greater than might be suggested by public health employment numbers. [49]

[47] Nightsoil and interception were transferred to the Lighting, Refuse and Stables Department in 1911.
[48] Auden (ed.), *A Handbook for Birmingham*, pp. 167-169.
[49] For instance, the Public Works Department, responsible for building the sewers and laying of pipes for water supply in 1884, employed 624 men, and the Water Department a further 280 men. It could be argued that the staff of the Drainage Board and the Public Baths Department were also eligible for inclusion. Bunce, *History of the Corporation II*, p. xl.

How the department was staffed also reflects the shifting approaches to public health. In terms of inspection and visiting, between 1901 and 1913 the male inspection staff had increased from thirty to fifty-two and female visiting staff from eight to thirty-seven.[50] With the extension of the city's boundaries, new legislation and local initiatives saw the introduction of more roles for women, including infant and tuberculosis visitors and an inspector of midwives. A housing section, formed by the new Housing and Town Planning Committee in response to the 1909 Act, had similar repercussions.[51]

[50] BAC, BCC/1/AR/1/1/22, Health Committee Minutes, June 1901 - October 1902, Report for Council Meeting 30 July 1901 (printed report pasted inside minute book); Auden (ed.), *Handbook for Birmingham*, pp. 167-169.
[51] Auden (ed.), *Handbook for Birmingham*, pp. 167-169.

Number of Employees	Job Title	Role
1	Medical Officer of Health	
1	Senior assistant MOH	For housing and general purposes
4	District assistant MOH	
1	Lady assistant MOH for infant mortality	
1	Chief sanitary inspector	(Formerly the ION role)
8	District sanitary inspectors	For general purposes
24	Assistant sanitary inspectors	For general purposes
3	Foods and drugs inspectors	
2	Milkshops and dairies inspectors	
4	Smoke abatement inspectors	
1	Common lodging-house inspector	
1	Inspector of houses lodgings and boats	
4	Inspectors of factories and workshops	
4	Inspectors for Shops' Act	
1	Lady inspector of midwives	
1	Lady superintendent of health visitors	
1	Assistant superintendent of health visitors	
19	Health visitors	
4	Special infant visitors	
10	Tuberculosis visitors	
Housing Staff 1	Chief inspector	
1	Assistant inspector	
2	Building inspectors	
1	Draughtsman	
2	Clerks	
15	Disinfectors and drivers	
13	Court cleansers	
18	Clerks	
1	City analyst	
3	Analytical assistants	
1	Laboratory assistant	
1	Laboratory clerk	
Hospital Staff 6	Medical officers	
215	Nursing and domestic staff	
55	Male staff	
Sanatoria 5	Medical officers	
44	Nursing and domestic staff	
13	Male staff	
492	**Total Staff**	

Table 7.1: Birmingham's Public Health Department in 1913
As listed in G. A. Auden (ed.), *A Handbook for Birmingham and the Neighbourhood* (Birmingham, 1913), pp. 167-169.

The shift to the 'maternalist state' is clear, with dedicated maternity and child welfare and the introduction of tuberculosis visitors.[52] More women were working in public health, but there was a clear segregation of the sexes, with female and male roles clearly defined. Although greater attention was paid to the 'environment of the home', the staffing of the department shows that the focus on the urban environment persisted in Birmingham.[53] With the city's acute shortage of accommodation, and back-to-back houses still part of the housing stock, the poor quality of many dwellings remained a major public health problem.[54] As previous chapters have revealed, the improvements in sanitation were not widespread at this point and the city's boundaries had expanded, thus increasing the number of sanitary inspectors to accommodate the new districts. However, as discussed in the next section, there was a clearer definition and greater segregation of medical and sanitary inspection.

Increased responsibilities demanded a larger workforce and this inevitably meant greater expenditure on salaries and wages but also on new infrastructure and transport. To provide a sense of the costs of public health in Birmingham, the annual expenditure for borough inspection in 1870 was just over £12,000, but by 1898 this had risen to almost £99,500.[55] By the end of the century, the total annual wage bill for the Health Committee was just over £45,000.[56] However, it should be remembered

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[52] Porter, *Health, Civilisation and the State*, p. 183.
[53] Berridge, *Public Health*, p. 57.
[54] 'City of Birmingham Central Areas Redevelopment', *The Media Archive for Central England* (otherwise known as MACE) https://www.macearchive.org/films/city-birmingham-central-areas-redevelopment [accessed 3 January 2024]. This short film reveals that out of 29,526 dwellings housing 102,000 people in 1946, 18,000 were back-to-back housing and 20,000 of those dwellings had no separate sanitary arrangements and 4,000 had no internal water supply.
[55] These figures have been calculated within a spreadsheet of financial information taken from the *History of the Corporation II (*pp. 149-151*) & III* (pp. 135). The net expenditure from the rates was £8,450.00 in 1870, rising to almost £90,000.00 by 1889 (the committee generated only a small income from the sale of manure and later from other sources through the processing of the refuse and interception department).
[56] Vince, *History of the Corporation III*, p. 135. This was the figure for 1898-9.

that this included interception and nightsoil, the sanitary section and the borough and isolation hospitals, each having their own set of accounts books. Looking specifically at the sanitary section there was a total expenditure of £9,611 in 1883, which included £711 for wages.[57] By 1913, this section's costs had risen to £42,390 and included a wage bill of £16,200.[58] To emphasise the later expansion of maternity and child welfare, expenditure is recorded in 1915-16 as £6,855, rising considerably to £69,670 by 1920-21.[59] The next section looks at individual employees in the sanitary section to gain further insight into pay, status and the career of public health work.

The Rise and Fall of Public Health Workers

The professionalisation of public health work in the first decades of the twentieth century is explored here via two key resources: the unpublished memoir written by Assistant Sanitary Inspector Hay McDonald, and the local archives research project on Blanche Gardiner, Superintendent of Health Visitors. A particular research question is how gender and class interacted with the professionalisation of their gendered roles. The surviving wage books and council minutes suggest that sanitary

[57] BAC, BCC1/AR/D/1/5/2/1, Sanitary Department Wages Book 1904-5. Some examples of pay: in 1904 the weekly wage bill for the disinfecting station was just under £8 with four or five employees paid between 25s and 32s each per week. In the same year there were 15 employed court cleansers who were paid a day rate of just under 4s, making a total weekly wage bill of £21. The wage book was for employees who were paid weekly; the salaried staff were included in the overall expenditure of the department.

[58] The extension of Birmingham's boundaries in 1892 and 1911 brought surrounding areas under the control of the council and increased Birmingham's population from almost 526,000 to just over 804,000. Each additional area (formerly under the control of another local authority) brought its own hospitals and public health administration and infrastructure which had to be absorbed into Birmingham's existing systems. See W. B. Stephens, 'The Growth of the City', *A History of the County of Warwick, Vol.7, The City of Birmingham* (London, 1964), pp. 4-25 available at: http://www.british-history.ac.uk/vch/warks/vol7/pp4-25 [Accessed 9 February 2019].

[59] J. T. Jones, *History of the Corporation of Birmingham, Vol. V, Part I* (Birmingham, 1940), p. 215. Note: for figures listed in 1920-21 the income had increased through government grants (amount not specified) and increases were noted as inflated prices following war.

inspectors' and health visitors' pay was based on a set scale dependent upon qualifications and length of service in the role.[60]

Sanitary Inspectors

The ION supervised a team of inspectors and up to 1904 worked closely with the MOH and the city's surveyor. It is much harder to piece together a chronology and compile biographical information about IONs than it is for MOHs. The ION is often not listed together with key officers in official handbooks or trade directories, hinting at the difference in status.[61] However, council histories and minute books along with local newspapers have assisted in identifying Birmingham's IONs (see Appendix 1: Index of Persons). The first was James Bliss, while the last to hold the ION post was John Parker, between 1885 and 1904. Unfortunately, there is no record of their educational background or any qualifications, although research suggests that some earlier IONs were former policemen and later incumbents would probably have needed to gain the Sanitary Certificate (see Fig. 7.3). After the retirement of Hill in 1903 and Parker in 1904 there was a restructuring and separation of responsibilities, with the new role of Assistant MOH taking over supervision of some of the inspecting staff in place of the ION. In fact, the title was replaced by Chief Inspector with a reduced starting salary of £175 per annum for supervising the assistant sanitary inspectors.[62] This signalled the split between medical and sanitary inspection work,

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[60] BAC, BCC1/AR/D/1/5/2/1, Sanitary Department Wages Book 1904-5; BCC1/BM/D/1/5/2/6, Child Welfare Wages Book 1918.

[61] Hamlin, 'Nuisances and Community'.

[62] BAC, BCC, BCC/1/AR/1/1/23, Health Committee Minutes 1902-1904; Vince, *History of the Corporation, IV*; see Appendix 1: Index of Persons, Inspector of Nuisances (ION) section. It is noted that the salary for the Chief Inspector could rise to a maximum of £225 after 10 years. The new Assistant MOH appointed in 1904 was Dr McCrindle at a salary of £300 per annum. McCrindle had a Diploma in Public Health and was given responsibility of supervising milkshops inspectors, lodging house inspectors and canal boat inspectors and the disinfecting staff (all formerly under supervision of the ION).

and the start of the shift from purely environmental concerns to the 'bacteriological era', something on which McDonald's memoir sheds light. [63]

Birmingham's sanitary inspectors were either allocated a district or a specific task such as smoke, factories and workshops, or canal boat inspector. Their main task was to identify a nuisance, either by regular spot checks or after reports were received, and then to work to abate that nuisance. This mostly involved issuing an abatement notice, checking that it was complied with and, if not, taking matters further by prosecution with fines set by the magistrates. As both Crook and Hamlin describe, what constituted nuisances evolved over the centuries but during the period of this study, they were primarily environmental offences, for example, overflowing ashpits, broken drains, keeping animals in the domestic space, smoke pollution and offensive trades.[64] In 1877, when there were sixteen inspectors, the rate of pay was between 28s and 32s plus uniform and caps.[65] In 1904-5, for the nineteen inspectors listed, the lowest rate was 32s and the highest 45s, although the majority were paid 36s per week which does not appear to be a significant increase over time.[66] Photographs of the public health department offices taken in 1912 show inspectors at their own desk within the inspectors' room where they could fill out their paperwork, and the uniforms worn at that time (Fig. 7.1).

[63] M. Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain 1865-1900* (Cambridge, 2000), p. 234.
[64] Brimblecombe, 'Historical Perspectives on Health', p. 124; Crook, 'Sanitary Inspection', p. 373.
[65] BAC, BCC1/AR/2/1/2, Health Sub-Committee Minutes 1874-1882.
[66] BAC, BCC1/AR/D/1/5/2/1, Sanitary Department Wages Book 1904/5, week 22 April 1904.



Figure 7.1: Birmingham City Council Sanitary Inspectors at their desks, 1912.

BAC, L45.1/532865, Photographs of Public Health Department. Reproduced with permission of Library of Birmingham.[67]

Parkinson suggests that any difference in status and qualifications, in comparison with MOHs, served local authorities well as this allowed them to set status and pay at a lower level.[68] McDonald's memoir reveals this pattern after he left school at the age of fourteen and started work for the council in 1895. His career with the council started in a storekeeper's office at a public works depot before moving to gain practical experience in sewage and drainage works. After five years he became a

[67] It is likely that Hay McDonald is in this photograph sitting at a desk but unfortunately no sitters' names were included in the album.
[68] Parkinson, 'Inspector of Nuisances', p. 10.

sanitary inspector,[69] as verified by the 1904-5 sanitary section wage book which shows McDonald on that weekly rate of 36s. By 1911, McDonald was still employed by the council and his pay had increased to £2 15s per week.[70] McDonald's experience in building and plumbing had been essential for the job and a 1906 advert for the post of assistant inspector confirms that experience of the building trades was the desired prerequisite for the post.[71] Despite starting so young, with a career of half a century, McDonald's memoir does not suggest a rise through the ranks, but rather the 'rise and fall of the sanitary inspector'.[72] His qualifications are not specified but there is a suggestion of an apprenticeship as McDonald mentions the importance of having papers to establish the rate of pay. It is perhaps significant that qualifications are not specified, intimating that McDonald did not further his prospects by attaining qualifications such as the Sanitary Certificate. It is possible that McDonald's class and level of education put him at a disadvantage to pursue further qualifications at his own expense. McDonald describes the fall of the sanitary inspector in terms of the erosion of status and powers after the introduction of the assistant MOH role, which McDonald considered demoted the sanitary inspectors' position to 'messengers or orderlies'.[73] McDonald also expressed his dislike of the division of roles in contrast to the all-round inspector and complained about the inspector being under 'a lot of chiefs' which included the chief inspector, the MOH, the assistant MOH, and the city's surveyor, analyst or architect.[74]

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[69] McDonald, 'Municipal Service', Chapter 1 'Early Days'.
[70] BAC, BCC/1/AR/D/1/5/2/1, Sanitary Department Wages Book 1904-5; BCC1/AR/2/1/10, Health Committee Sub Committee Book 1906-1911.
[71] *Birmingham Daily Post*, 29 September 1906. The advert stated that experience of plumbing or building trades was required, candidate to be under 35 years of age and the rate of pay 30s per week plus uniform.
[72] McDonald, 'Municipal Service', Chapter 'Rise and Fall'.
[73] McDonald, 'Municipal Service', Chapter 'Rise and Fall'.
[74] McDonald, 'Municipal Service'.



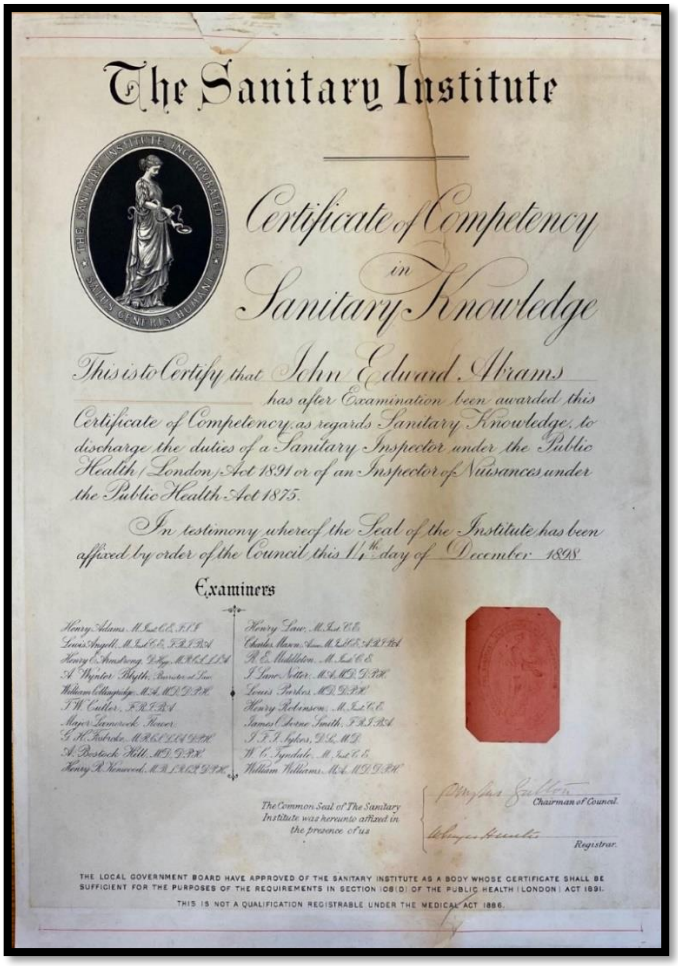
Figure 7.2: Birmingham City Council Assistant Medical Officers of Health in their Office, 1912.

BAC, L45.1/532865, Photographs of Public Health Department. Reproduced with permission of Library of Birmingham.

In contrast, another male council employee, John Edward Abrams, demonstrates how training and certification allowed him to progress. Abrams attained the Sanitary Certificate in 1898, a known fact because his certificate survives in the archives (see Fig. 7.3).[75] Census records reveal that Abrams was born in Hull, Yorkshire and that he had been a grocer, but in a later census he was listed as an architect draughtsman – therefore well educated and apprenticed in a profession. By 1911, he

[75] BAC, MS 1316, Sanitary Certificate, qualification of John Edward Abrams.

was living in King's Norton, Birmingham and was employed by the council as a surveyor.[76] His qualifications were important for promotion, and by 1915 Abrams is listed as the city's Chief Housing Inspector in *Kelly's Directory of Birmingham*.[77] Abrams' class and occupational background offered better opportunities for education and qualifications, enabling him to progress to more senior and better paid positions; in 1913 Abrams' salary is recorded as £325 per annum.[78]



The Sanitary Institute

Certificate of Competency in Sanitary Knowledge

This is to Certify that John Edward Abrams has after Examination been awarded this Certificate of Competency as regards Sanitary Knowledge, to discharge the duties of a Sanitary Inspector under the Public Health (London) Act 1891 or of an Inspector of Nuisances under the Public Health Act 1875.

In testimony whereof the Seal of the Institute has been affixed by order of the Council this 14th day of December 1898

Examiners

Henry Adams, M. Inst. C.E., F.I.I.
Louis Angell, M. Inst. C.E., F.S.I., F.R.I.B.A.
Henry C. Armstrong, D.Sc., M.R.C.S., L.R.C.P.
A. Wynter Blyth, Barrister-at-Law
William Chapman, M.A., M.R.C.S., D.P.H.
T. W. Cutler, F.R.C.P., F.R.I.B.A.
Major Tancock, Royal Engineers
G. H. Bostock, M.R.C.S., L.R.C.P., D.P.H.
A. Bostock Hill, M.D., D.P.H.
Henry R. Kenwood, M.B., F.R.C.P., D.P.H.
Henry Law, M. Inst. C.E.
Charles Mann, Assoc. M. Inst. C.E., F.S.I., F.R.I.B.A.
R. E. Middleton, M. Inst. C.E.
J. Jane Notter, M.A., M.D., D.P.H.
Louis Parkes, M.D., D.P.H.
Henry Robinson, M. Inst. C.E.
James Orme Smith, F.R.I.B.A.
J. F. J. Sykes, D.Sc., M.D.
W. C. Tyndale, M. Inst. C.E.
William Williams, M.A., M.D., D.P.H.

The Common Seal of The Sanitary Institute was hereunto affixed in the presence of us

Chairman of Council.

Registrar.

THE LOCAL GOVERNMENT BOARD HAVE APPROVED OF THE SANITARY INSTITUTE AS A BODY WHOSE CERTIFICATE SHALL BE SUFFICIENT FOR THE PURPOSES OF THE REQUIREMENTS IN SECTION 108 (D) OF THE PUBLIC HEALTH (LONDON) ACT 1891.

THIS IS NOT A QUALIFICATION REGISTRABLE UNDER THE MEDICAL ACT 1886.

Figure 7.3: John Edward Abrams' Certificate of Competency in Sanitary Knowledge 1898.

BAC, MS 1316, reproduced with permission of Library of Birmingham.

[76] The National Archives, Kew (TNA), Census of England and Wales for 1891, 1901 and 1911, accessed via the online database *Ancestry UK* (2002-2022) https://www.ancestry.co.uk/ [accessed 13 February 2022].
[77] *Kelly's Directory of Birmingham* (London, 1915).
[78] BAC, BCC1/BM/1/1/3, Public Health Committee Minutes, 1913-14, 13 June 1913.

Health Visitors

In contrast to the established gendered role of nursing, women did not enter the ranks of Birmingham's sanitary staff until 1899. Prior to that women's involvement in council public health work had been voluntary, through an external female middle-class network.[79] The Ladies' Association for Useful Work was founded in 1876 through subscription and became closely linked to the Health Committee, producing reports that were recorded in council minute books.[80] Its purpose was to deliver lectures on health and sanitary matters to working women. The transfer of some subscribers suggests that this association was a reformed Ladies' Education Association which had previously offered educational classes for university examinations for girls. Subscriber lists reveal that male and female members of the city's elite subscribed with the wives, sisters and daughters of the civic-gospel-inspired Liberal councillors taking on key committee roles in the Association. [81] Mrs Dale, wife of the civic gospel preacher, Robert Dale, gave lectures and presented a paper at the Social Science Congress held in Birmingham in 1881 about the work of the Association.[82] Despite the desire to do useful work, the Association never really reached the women who might have benefited from its advice. By 1880, the Association acknowledged that it was not reaching their 'poorer sisters' and expressed disappointment that their efforts had not been received more readily. However, these elite ladies of the Association were not visiting the courts of back-to-

[79] The female network consisted of the sisters, wives and daughters of the civic-gospel-inspired elite councillors such as Susan Martineau, Mrs Robert Dale, Clara Chamberlain (Joseph's sister). BAC, L46 141567, Ladies' Association for Useful Work (Annual Reports) 1876-1903.
[80] Ladies' Association for Useful Work; BAC, BCC1/AR/1/1/12, Health Committee Minutes 1884-6. For an example of a report, see minutes 18 March 1885.
[81] Ladies' Association for Useful Work; Procter, 'Infant Mortality', pp. 74-75, 77.
[82] BAC, L 20.08, *Transactions of the National Association for the Promotion of Social Science* (Birmingham, 1881), pp. 529-530.

backs; instead, they gave lectures in church halls and rooms in the new board schools opened by the council. Analysis of the Association's annual reports reveals that cookery advice was given, but surviving promotional posters for these classes suggested that people 'could send their cook instead'. There were also written test papers after classes with a charge of a penny for the sanitary pamphlets. All these aspects demonstrate a lack of understanding on the part of the Association ladies about what life was like for their poorer sisters who could hardly have been more different in terms of social class and education. However, the Association did manage to find a niche offering classes for the better educated girls of the upper-working classes and setting up a refreshment room with reading material for shop assistants in the centre of town.[83]

In the hope of reaching out to their poorer sisters there was a change of tactics when the MOH delivered courses of lectures to 'visitors of the poor' – for example, missionaries – to increase their knowledge in order to educate others.[84] Procter agrees that Birmingham's adoption of visiting to reduce infant mortality rates had been influenced by the scheme that been operated for several years in Manchester by a voluntary ladies' association. From 1890 Manchester's local authority started to pay the salaries of some of these visitors.[85] Davies suggests that Birmingham's MOH, Dr Alfred Hill, and his son Dr Bostock Hill, MOH for Warwickshire, were both committed to this area of public health work at the turn of the century.[86]

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[83] Ladies' Association for Useful Work. A poster for cookery classes is loosely inserted into the book. For a detailed analysis of the Association, their health lectures and impact, see Procter, 'Infant Mortality', pp. 76-93.
[84] Ladies' Association for Useful Work.
[85] *Manchester Evening News*, 9 November 1899; Heggie, 'Health Visiting and District Nursing', p. 409; Procter, 'Infant Mortality', p. 74.
[86] Davies, 'The Health Visitor as Mother's Friend', p. 45.

Birmingham's health visiting section began with four female visitors.[87] This suggests the introduction of health visiting on a trial basis to enable councillors to see its potential impact. The initiative expanded, gradually increasing to eight and then to twelve visitors by 1902, with each individual responsible for a specified district that contained approximately 3000 houses. The health visitor was expected to visit those houses with three rooms or less, those where a birth had taken place, and those where cases of 'bad heads were known'.[88] A decade later, as Table 7.1 shows, more women were involved in inspection and the provision of health and welfare services, including two female workshop inspectors as some of Birmingham major trades – the pen trade, in particular – employed mostly women.[89] Appendix 10 offers more details about some of the women working as health visitors in Birmingham, drawing information from census returns, news sources and surviving council records to gain some insight into the social and educational background of these workers.[90]

[87] Vince, *History of the Corporation, III,* p. 414.
[88] FoBAH, *Born in Birmingham*.
[89] 'Brief History of the Birmingham Pen Trade' a booklet produced by the Birmingham Pen Trade Heritage Association to promote knowledge of the trade in September 2000.
[90] BAC, BCC1/AR/D/1/5/2/1, Sanitary Department Wages Book 1904-5; BCC1/BM/D/1/5/2/6 Child Welfare Wages Book 1918; TNA, Census of England and Wales for 1901 and 1911, accessed via the online database *Ancestry UK* (2002-2022) https://www.ancestry.co.uk/ [accessed 13 February 2022].



Figure 7.4: Birmingham City Council Health Visitors at their Desks, 1912.

BAC, L45.1/532865, Photographs of Public Health Department. Reproduced with permission of Library of Birmingham.[91]

The first tentative calls for women to the role in Birmingham expressed the desire for such women to be 'well educated and physically strong'.[92] From the start the role received a lower rate of pay than a sanitary inspector. As Meta Zimmeck highlights, women's lower rate of pay was rooted in the social construct of a 'breadwinner' wage for the male head of a family household and a 'single wage' for unmarried women

[91] The album of photographs of the Public Health Department building taken in 1912, shows that only the Medical Officer of Health and Assistant MOH had offices. The Chief Inspector and Superintendent of Health Visitors had their own desk and space within the inspectors' and visitors' room.
[92] FoBAH, *Born in Birmingham.*

who were never considered to be heads of households.[93] Hill, when asked for comments about employing health visitors in the city, stated that application was open to ladies who were not Associates of the Sanitary Institute, but under the age of thirty-five and with experience among the poor and the sick. He also suggested that they might want to live locally, perhaps in the new Women's Settlement in the town.[94] This suggests that Hill initially considered that educated women from the working classes were the most suitable candidates. The criteria rapidly evolved and by 1900 job advertisements for health visitors in Birmingham started to specify that certificates in 'Sanitary Knowledge and Aid to the Sick' were desirable. The main duties of the role were clearly stated: 'visiting house to house in the poorest parts of the city', checking on cleanliness, giving advice on the rearing of children and the care of the sick. The role also required the distribution and explaining of handbills for the prevention of infectious disease.[95] Further examination of local newspaper job and training advertisements demonstrates the rapid professionalisation of this role during the first part of the twentieth century. By 1913, Birmingham's Municipal Technical School offered courses for public health subjects, including 'Hygiene – for schoolteachers, nurses, health visitors and others'.[96] The following year, adverts specified that nursing experience was required, suggestive of the medicalisation of health visiting.[97] This encouraged those already in the nursing profession to transition to this role, thus raising the question as to whether health visiting was a well-paid

[93] M. Zimmeck, 'The 'New Woman' in the Machinery of Government: A Spanner in the Works?', in R. MacLeod (ed.), *Government and Expertise: Specialists, Administrators and Professionals, 1860-1919* (Cambridge, 1988), pp. 185-202, p. 195.
[94] *The Queen*, 4 March 1899; for more details of Birmingham Women's Settlement, see J. Glasby, *Poverty and Opportunity: 100 years of the Birmingham Settlement* (Studley, 1999).
[95] *Birmingham Daily Post*, 19 March 1900.
[96] *Birmingham Daily Gazette*, 13 September 1913.
[97] *Birmingham Daily Gazette,* 12 December 1914.

occupation for women. This is difficult to calculate as a nurse's wage included accommodation. A district nursing society was established in Birmingham from 1870 and in 1899 nurses were paid £25 per annum plus board and lodging.[98] The average weekly wage for a Health Visitor in Birmingham in 1904 was between 25s and 30s (translating to £78 per annum if paid at the upper scale) plus uniform.[99] Vanessa Heggie, making a comparison between district nurses and health visitors in Manchester based on average costs of board and lodgings at that time, concluded that a district nurse's wages were twenty per cent higher than those of a health visitor, which supports Davies' assertion that pay for health visitors was not good.[100] However, when the role was first advertised in Birmingham it was at a weekly rate of 25s, which was considerably higher than the rate paid by Manchester and Glasgow Corporations, at £1 and 14s respectively.[101]

The census address information suggests that the role attracted the upper-working to lower-middle classes.[102] Some of the women were boarders but others lived with parents who were retired or widowed, a fact that suggests that their income helped to support the household. Further analysis reveals that some had switched profession from teaching to health visiting, perhaps indicating that health visiting attracted better

[98] BAC, Local History Studies, I. H. Morris, 'A Century of District Nursing in Birmingham, 1870-1970' (unpublished typed manuscript).
[99] BAC, BCC/1/AR/D/1/5/2/1, Sanitary Department wages book 1904-5. Sources for nursing during WWI suggest that pay could be £40 per year as a staff nurse; see 'Nursing During the First World War, *British Red Cross* (2024) https://vad.redcross.org.uk/medical-care-during-ww1/nursing-during-the-first-world-war [accessed 8 January 2024].
[100] Davies, 'The Health Visitor as Mother's Friend', p. 52; Heggie, 'Health Visiting and District Nursing', p. 414.
[101] *The Queen*, 4 March 1899. Appendix 9 includes the pay information for Birmingham's health visitors taken from the surviving wage books from 1904-5 and 1918, BAC, BCC1/AR/D/1/5/2/1, Sanitary Department Wages Book 1904-5; BCC1/BM/D/1/5/2/6 Child Welfare Wages Book 1918.
[102] TNA, Census of England and Wales for 1901 and 1911, accessed via the online database *Ancestry UK* [13 February 2022].

pay in Birmingham. Women who made the career choice of nursing or teaching were commonly subject to the marriage bar, which was not removed until 1944, because of the gendered expectation that once married, a woman would not have time to work in addition to household and childcare responsibilities.[103] Job advertisements for health visitors in Birmingham did not expressly state that applicants had to be unmarried, but they did request the marital status of the applicant and specified the age criterion as between twenty-five and thirty-five years. In 1914 the age criterion remained, but advertisements no longer asked for applicants to specify their marital status.[104] With one exception, all the health visitors listed in Appendix 10 were unmarried. As revealed in the 1911 census, the one married member of staff, Mrs Rogerson, was childless. Ellen Riley, one of the city's early visiting staff, was no longer listed by 1904, perhaps suggesting that she left post to marry, and Miss Arnold, who was the superintendent before Gardiner, definitely left post to marry as that fact is recorded in committee minutes.[105] Hence, there was a marked preference for well-educated and unmarried women and the evidence suggests health visitors in Birmingham were better paid than those working for other authorities.

However, health visitors received a lower rate of pay than a male sanitary inspector working in Birmingham. Comparing surviving wages books for 1904-5 and 1918 reveals that Mrs Rogerson, Misses Wright, Miller, Sykes and Montgomery were still in post as health visitors with pay at 44s per week (in 1904 it had been 30s). These women had qualifications in nursing, midwifery and either health visiting or sanitary inspection. For comparison, the weekly pay for McDonald as an assistant sanitary

[103] Zimmeck, 'The New Woman', p. 195.
[104] *Birmingham Daily Gazette*, 12 December 1914.
[105] BAC, BCC1/AR/1/1/26, Health Committee Minute Book 1908-1910, 8 February 1910.

inspector, and whose memoir suggests he served an apprenticeship (as any qualifications are not specified), was £2 15s (or 55s). By contrast, Misses Vaughan, Hillas and Moss were also still employed by the department but had seen their role title changed to infant visitors with a lesser weekly rate of 35s to 37s (in 1904 it had been 27s 6d).[106] The Notification of Births Act 1907, and its subsequent extension in 1915 with powers for extra care of expectant mothers and children under five, created this 'new' role of infant visitor. By 1918 Birmingham's health visiting had been separated into forty-four infant visitors and twenty health visitors, plus a host of other staff due to the proliferation of council and charitable child welfare centres.[107] For the women originally employed as health visitors, who in essence had been demoted to infant visitors, this demonstrates that Birmingham council introduced a system where certification was useful to set status and lower rates of pay. This is despite the fact that they had been doing the job of health visitor previously, although the medicalisation of the role may have had an impact. Even so, the length of service in department suggests that women made the visiting occupation their career and that the pay and professional status for these roles was considered better than other forms of women's work in the city.

The Superintendent's Post

The Superintendent was at the head of the health visitors section and after Miss Arnold left to be married, the post was advertised early in 1910. Florence Wright had been assistant superintendent for four years and it might have been assumed that she could have automatically assumed the role. This was not the case, however, and

[106] BAC, BCC1/BM/D/1/5/2/6 Child Welfare Wages Book 1918.
[107] BAC, BCC1/BM/D/1/5/2/6 Child Welfare Wages Book 1918; FoBAH, *Born in Birmingham.*

Wright had to apply for the post. Council minutes reveal that eight candidates were shortlisted for interview, including Wright and Gardiner, with details of each candidate's qualifications and experience. All candidates were over thirty-five years of age and already employed as either sanitary inspectors or health visitors. In terms of qualifications, all had the certificate of the Sanitary Institute along with a mixture of midwifery, first aid, and nursing qualifications. Only Gardiner had a degree, which she obtained from Bedford College, and further details about Gardiner's background, education and career can be found in Appendix 1: Index of Persons. There is no deliberation in the minutes, purely a record of the decision that Gardiner was appointed at a salary of £150 per annum. Wright had years of experience of the city and the post, was well qualified and had been a former teacher, so why was she overlooked? It is possible that Gardiner may simply have performed better during interview, and as discussed later, was confident delivering lectures. However, it is also possible that Gardiner's more middle-class background and higher education influenced the decision. The committee appears to have chosen the candidate with the highest qualification, with Wright retained in the assistant position as the highest weekly paid health visitor.[108] Gardiner's salary rose to £160 in 1913, but this is perhaps not a significant increase considering the department's expansion after the Greater Birmingham Act of 1911. By 1924, Gardiner was responsible for ninety-four health visitors in the hugely expanded mother and child welfare services. In terms of status within the department, Gardiner did produce her own reports and these were included in John Robertson's MOH annual report, which suggests respect and status

[108] BAC, BCC1/BM/D/1/5/2/6 Child Welfare Wages Book 1918.

for her role.[109] Gardiner remained in post until 1929 and certainly considered herself a public health professional of status within the department as she was salaried and shown respect for her position by male colleagues. Despite this, she never reached the pay scales of her male degree-educated counterparts, nor did she see the wage equality she campaigned for so passionately on behalf of health visitors, as public health work became more defined by gender – an aspect that is explored further in the next section.

Professionalisation and Gender

The rapid professionalisation of health visitors was in part motivated by the battle between the sexes and their contribution to public health work, with conflict between male and female sanitary inspectors over status and pay inequality.[110] Male MOHs and councillors considered females best placed to effectively tackle infant mortality.[111] However, as shown here and in agreement with Heggie, it was the educational role of the better educated women, teaching and instructing the poorer and less educated, that was the key aim of visiting.[112]

These early 'contradictions' about gender identity and the interactions between the classes can be heard through the voice of Rosetta E. Gardiner (no relation to Blanche) at the 1900 Sanitary Institute Congress in Southampton.[113] Rosetta, as one

[109] BAC, BCC1/BM/1/1/2, Public Health Committee Minutes 1912-13. FoBAH, *Born in Birmingham* Booklet, p. 29.
[110] Davies, 'The Health Visitor as Mother's Friend', pp. 39, 41, 47.
[111] Davies, 'The Health Visitor as Mother's Friend; J. R. Haynes, 'Sanitary Ladies and Friendly Visitors; Crook, 'Sanitary Inspection', pp. 369-393; V. Heggie, 'Health Visiting and District Nursing', pp. 403-422.
[112] Heggie, 'Health Visiting and District Nursing', p. 406.
[113] Heggie, 'Health Visiting and District Nursing', p. 404; R. E. Gardiner, 'The Work of a Health Visitor', Conference of Ladies on Domestic Hygiene, *JRSI*, 21, 1 (1900), pp. 164-189, p. 174.

of Birmingham's first health visitors, spoke about 'the work' and emphasised that a visitor 'must, of necessity, be a woman' as they were best placed 'by advice, example and practical sympathy' to 'urge the poorer classes' towards a healthier and more hygienic home and life.[114] Fourteen years later, Superintendent Blanche Gardiner, speaking at a conference, described the 'more varied nature of the work', and referred to her colleagues as 'women public health officials'.[115] Blanche Gardiner's description of the work certainly suggests greater officialdom and bureaucracy and even greater medicalisation of the role, including taking swabs from babies by tuberculosis visitors who were all fully trained nurses.[116] This demonstrates the move away from the 'mother's friend' approach.[117] By 1914, the conversation had moved on to consider the place of female public health workers, their salaries and holiday entitlement. A key point made by Blanche Gardiner was that many women working as health visitors had the same qualification as male sanitary inspectors (just as she herself did), and yet they were paid 'considerably less than […] men of similar education, culture and social status'. She also highlighted that there was great variation in the levels of pay between women public health workers around the country. This might be dependent on location and title or role, as by this time in the larger urban centres, the job title of health visitor had been joined by the infant or tuberculosis visitor.[118] Her arguments were naturally influenced by her experiences working for Birmingham council: Blanche Gardiner exemplifies the struggles within the profession and the importance placed upon class and education.

[114] R. E. Gardiner, 'The Work of a Health Visitor', p. 174.
[115] B. Gardiner, 'The Varied Nature of the Work', p. 511.
[116] B. Gardiner, 'The Varied Nature of the Work', pp. 512-513
[117] Davies, 'The Health Visitor as Mother's Friend', p. 39.
[118] B. Gardiner, 'The Varied Nature of the Work', pp. 511, 514.

This was not the first time that Gardiner had raised the issue of the gender pay gap. In an earlier post working at St Pancras, she 'brought cheers from the assembly' at a session of the Royal Sanitary Institute in 1907, when she challenged an MOH's views on their qualities and work, asking why there was not equal pay for male and female sanitary inspectors.[119] Even earlier in 1904, Gardiner was recorded in the diary of Clara Collet, labour correspondent to the Board of Trade, after a conversation about the rates of pay as a sanitary inspector in St Pancras.[120] Gardiner had haggled over her rate from 30s per week and had requested £2 per week, but she settled for 35s per week, as she stated she was too interested in the work and received assistance from her father.[121] The point about the same qualification was relevant: the women who had been employed by local authorities at the end of the nineteenth and beginning of the twentieth century had taken the same certification exams as their male counterparts. Their concern for recognition was revealed by the formation of the Women's Sanitary Inspectors Association in 1898 in London, and by 1906 the number of women employed as sanitary inspectors or health visitors had increased steadily and the Association expanded its network to include women from the provinces. The first Provincial Centre of the Association was founded in Birmingham in 1912, two years after the arrival of Blanche Gardiner.[122] This suggests that Gardiner was one of the dominant women described by Davies as 'exceptional and

[119] H. Meredith Richards, 'The Aim and Scope of Women's Work in relation to Public Health', *JRSI*, 28 (1907), pp. 193-6 and account of discussion pp. 196-201, as cited in Davies, 'The Health Visitor as Mother's Friend', p. 52.
[120] Clara Collet was a civil servant and promoter of women's employment; see D. Doughan, 'Collet, Clara Elizabeth (1860–1948)', *Oxford Dictionary of National Biography*, https://doi.org/10.1093/ref:odnb/39079 [accessed 6 January 2024.]
[121] From a diary entry of Clara Collet as cited by Haynes, 'Sanitary Ladies and Friendly Visitors', pp. 134-135.
[122] The parent Association was renamed in 1915 as Women's Sanitary Inspectors and Health Visitors' Association, to reflect the greater number of women who were then employed as health visitors. There is an archive held by Wellcome Collection in London (WC), SA/HVA, Health Visitors' Association archive (1902-1990).

determined' and who had 'pioneered in the work of sanitary inspection in London and elsewhere'.[123] By 1918, the Association was affiliated to the National Union of Women Workers.[124]

The situation was not helped when the Royal Sanitary Institute started to set specific examinations in Health Visiting in 1908. This happened at a time of debate and conflict between male and female sanitary inspectors which, Davies suggests, served 'to create a separate sphere of women's work and affirm it by a separate examination'.[125] Women were seen as rivals and could be a cheaper option for local authorities rather than the better-paid male inspectors. However, there were also debates around whether women inspectors should be visiting slaughterhouses with 'petticoats trailing in blood' and taking landlords to task over conditions.[126] Male inspectors did not seem to argue that women held a place in public health, but it was a separate one that encompassed mothers, children and milk depots which fitted with the construct of what was deemed 'women's work'.[127] Zimmeck points out that special women's posts were created to deal separately with women's issues with 'telltale pink bows titles' – hence a lady MOH, a lady factory inspector and lady superintendent of health visitors, as can be seen in Birmingham's 1913 list of department staff (Table 7.1).[128] Blanche Gardiner may have outranked the assistant

[123] Davies, 'Health Visitor as Mother's Friend', p. 52.
[124] Davies, 'The Health Visitor as Mother's Friend', p. 52; J. Wright, 'Early Training of Health Visitors and the Development of the Professional Body', *Born in Birmingham 1914-24* [Blog] https://borninbirmingham.home.blog/2020/05/26/early-training-of-health-visitors-and-the-development-of-the-professional-body/ [accessed 19 January 2022].
[125] Davies, 'The Health Visitor as Mother's Friend', pp. 49-57, p. 51.
[126] Davies, 'The Health Visitor as Mother's Friend', p. 50.
[127] *Ibid*.
[128] Zimmeck, 'The 'New Woman', p. 193.

sanitary inspectors and had higher qualifications, but she was never put in charge of male members of the department.

McDonald's memoir appears to confirm that in Birmingham there was no battle between the sexes over sanitary inspection as the lines between inspection and visiting were drawn right from the start. McDonald does not refer to the city's health visitors in his memoir, reflecting their complete segregation within the department with their separate rooms. However, male sanitary inspectors had their own internal concerns for professional status, a situation into which McDonald's memoir offers insight.[129] As Brimblecombe points out, there were struggles over the organisation of a qualification system, and many senior and older inspectors without certification (but with years of practical experience in the job) felt threatened.[130] Once an organised system was established, it left those without the necessary certification stuck and unable to progress. McDonald's memoir and the surviving council wage records suggest that he fell into this category, possibly accounting for his resentment over 'the rise and fall' of the sanitary inspector. And while he mentions the number of technical schools offering courses in public health, he does not imply that he attended.[131]

It appears that Wright and McDonald, regardless of gender, were both hindered in career advancement due to their class, professional status or lack of specific qualifications. In a period when the goalposts were continually moving in terms of certification, Wright, despite her multiple qualifications taken at Technical Schools,

[129] Parkinson, 'Inspector of Nuisances', pp. 10-13; Brimblecombe, 'Historical Perspectives on Health', pp. 127-128; Crook, 'Sanitary Inspection', pp. 374-375, 380, 382.
[130] Brimblecombe, 'Historical Perspectives on Health', p. 127.
[131] McDonald, 'Municipal Service'.

never had the opportunity for higher education. Conversely, McDonald entered the profession via practical experience after being employed by the council as a young boy. With his more working-class background he had the expectation that apprenticeship and practical experience mattered. Both were examples of the wider shift in English society referred to by Perkin and reiterated by Brimblecombe.[132]

Conclusions

Consideration of the development and expansion of municipal public health has offered insight into how new public health thinking, impacted by the rise of bacteriology, translated into practice. In particular, the sanitary section demonstrates that a diverse workforce was required as the council attempted to meet all its obligations. The findings support Berridge's view that there was no 'instant switch' to the new way of thinking for public health.[133] Despite the introduction of more welfare services in respect to mother and child, Birmingham's department was still heavily staffed for sanitary and housing inspection in the second decade of the twentieth century, although there was increasing segregation from medical inspection with the introduction of the assistant MOH role. The new style of public health was present and expanding in the city, particularly as the city's second MOH, John Robertson, was an exemplar of the modern administrator, with qualifications in bacteriology and ideas about individuals and their habits (discussed further in Chapter Eight). However, the 'Victorian problems' of poor sanitation, slum housing and poverty were

[132] Brimblecombe, 'Historical Perspectives on Health', p. 124 where he cites the work of Perkin, *Rise of Professional Society* (1989).
[133] Berridge, *Public Health*, p. 56.

all still very much present, preventing a complete shift in public health thinking. As will be explored in the next chapter, despite this shift in emphasis to the individual as a vector of transmission of disease, the urban environment remained a problem.[134]

In Birmingham there was a clear gendering of inspection and visiting from the start, with male employees to combat nuisance and insanitary conditions, and female staff to concentrate on infant mortality. This chapter's findings support Parkinson's assertion that the struggles over certification within the professions served to assist authorities in setting lower scales of pay, although there is evidence to suggest that workers in Birmingham were better paid than other municipal workers around the country.[135] The pressures of continually expanding populations and boundaries and their impact on budgets meant that restricting pay was one option to enable the sanitary section to be staffed to a certain level. Due to the scale of the voluntary welfare provision in the city as comprehensively detailed by Procter, municipal child and welfare staffing was never totally adequate until government subsidies arrived with the Maternity and Child Welfare Act 1918.[136]

The study of individual public health workers has offered a unique insight into the professionalisation of public health work. Both sexes experienced similar challenges within a context of class, professionalisation and the organisation of a qualification system.[137] McDonald's view of the rise and fall in status of male sanitary inspectors was valid, particularly for those who were in post before implementation of the

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[134] D. Porter and E. Fee (1992) cited in Porter, *Health, Civilisation and the State*, p. 140.
[135] Parkinson, 'Inspector of Nuisances'.
[136] Porter, *Health Civilisation and the State*, p. 185; Procter, 'Infant Mortality', p. 160.
Procter's research into the voluntary child welfare sector supports this view and suggests that the development of a health visitor service took approximately thirty years to be city-wide and universal.
[137] Crook, 'Sanitary Inspection', pp. 379, 383.

qualification system. Conversely, female health visitors saw their status elevated due to the rising importance of mother and infant welfare services. However, although the qualification system helped to secure women's place in public health work, that rising importance and elevated status did little to bridge the gender pay gap.[138]

Turning next to look more closely at the head of the Public Health Department and the first two MOHs for Birmingham, Chapter Eight considers their influence on municipal policy and their impact on the health of the city.

[138] The first female Assistant MOH, Jessie Gellatly, was appointed in 1914 for Cambridgeshire. Catherine Crane was appointed Assistant MOH at York in 1936 and then went on to become the first female MOH in 1946 at York. See 'History of Public Health Timeline', 1 December 2022, *Association of Directors of Public Health* https://www.adph.org.uk/resources/175th-anniversary-timeline/ [accessed 27 July 2023].

Chapter Eight

Health of a City: The Impact of Birmingham's First Medical Officers of Health, 1872-1927

Introduction

Birmingham's first Medical Officers of Health (MOHs), Dr Alfred Hill (1872-1903) and Sir John Robertson (1903-1927), span the period when public health and its practice was increasingly regulated and brought under legislative control. As heads of local public health administration, they were active participants in local government developments and social reform from the mid-nineteenth century.[1] However, as Michael Worboys explains and this study demonstrates, MOHs were part of a broader public health enterprise that encompassed not only preventative medicine but also science, civil engineering and technological advancements.[2]

An extensive historiography covering MOHs, mortality decline, theories of disease and medical practice has been referred to throughout this thesis, but some key texts have been influential for this chapter. Worboys' *Spreading Germs* (2000) examines British medical theory and practice from the mid-nineteenth century to the start of the twentieth century. Contrary to the prevailing presentation of a linear progressive rise of germ theory through the developments in European laboratories, Worboys detects in Britain a multi-layered transitional period with no single moment of decisive

[1] A. Hardy, 'Public Health and the Expert: The London Medical Officers of Health, 1856-1900' in R. MacLeod (ed.), *Government and Expertise: Specialists, Administrators and Professionals, 1860-1919* (Cambridge, 1988), pp. 128-142, pp. 128-9; M. Brown and C. Kelly, 'Authority' in J. Reinarz (ed.), *A Cultural History of Medicine in the Age of Empire* (London, 2021), pp. 199-218, p. 208.
[2] M. Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain 1865-1900* (Cambridge and New York, 2000), p. 25.

change.[3] David Barnes, in his work on Paris, defines this transition in action as the 'sanitary-bacteriological synthesis' (SBS), with the merging of 'new and old' aetiologies to establish 'its centrality in the development' of understanding disease.[4] In contrast, Graham Mooney's *Intrusive Interventions* (2015) pays greater attention to the 'performative aspects' or everyday practice of public health, something that Worboys later regretfully acknowledged he had neglected.[5] Mooney's exploration of local infectious disease management, with Birmingham as one of the case studies, offers greater contextualisation of the ideology and practice of public health within urban government.[6] This study builds on the work of Worboys, Barnes and Mooney to explore the 'relationship of different kinds of knowledge and practice' through an examination of Birmingham's first two MOHs, each of whom were in post for over a quarter of century. It looks for evidence to support or challenge the SBS and the gradual transition, and whether a significant turning point can be identified in the locality for the shift in public health thinking.[7] It adds to the contextualisation of the ideology and practice of public health by exploring the central and local governmental and cultural environment within which the MOH practised.

Broad surveys of public health chart the shift from 'the environmentalist and sanitarian model' through to germ theory and bacteriology in tandem with the influence of new scientific ideologies and how social 'anxieties' fostered the interest

[3] Worboys, *Spreading Germs*.
[4] D. S. Barnes, *The Great Stink of Paris and the Nineteenth-Century Struggle against Filth and Germs* (Baltimore, 2006), pp. 134-135.
[5] M. Worboys, 'Practice and the Science of Medicine in the Nineteenth-Century', *Isis*, 102, 1 (2011), pp. 109-115; G. Mooney, *Intrusive Interventions: Public Health, Domestic Space and Infectious Disease Surveillance in England, 1840-1914* (Rochester, NY, 2015), p. 4.
[6] Mooney, *Intrusive Interventions*.
[7] Barnes, p. 135; Worboys, 'Practice and the Science', p. 115.

in mother and infant welfare services in the first decades of the twentieth century.[8] Christopher Hamlin discusses the drive for the improvement of populations within the context of 'the emerging science of heredity' or rather the 'science and practice of eugenics'.[9] Hamlin suggests that eugenics exposed a class division as 'it appealed to those with wealth and power'.[10] Conversely, Virginia Berridge suggests that eugenics was a 'creed' and 'a widely accepted way of thinking' in the early twentieth century.[11] Dorothy Porter argues that British public health policy was 'little affected' by 'the plans of eugenics' and disagrees with Greta Jones' argument that eugenics had a public impact through social hygiene which – according to Jones – was the 'marriage' of traditional public health and eugenics.[12] Chris Renwick agrees with Porter that there was little progress, apart from the 1913 Mental Deficiency Act, on national political policy. However, he does highlight a relationship between eugenics and quantitative social mobility research, an important area of sociology.[13] Similarly, Patricia Garside explores 'the penetration' of the town planning movement by eugenic ideas. At a more local level, as John Welshman points out, little attention has been given to the influence of eugenics beliefs on local MOHs or on local policy,[14]

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[8] V. Berridge, *Public Health: A Very Short Introduction* (Oxford, 2016), pp. 55-60. For a more detailed discussion on the quality of population, family welfare, eugenics and social policy, see D. Porter, *Health, Civilization and The State: A History of Public Health from Ancient to Modern Times* (London and New York, 1999), pp. 165-195.
[9] D. B. Paul (1995) and D. Kevles cited in C. Hamlin, 'The History and Development of Public Health in Developed Countries', in R. Detels, M. Gulliford, Q. A. Karim and C. Chuan Tan (eds), *Oxford Textbook of Global Public Health,* 6th Edition (Oxford, 2015), p. 29.
[10] Hamlin, 'The History and Development of Public Health', p. 29.
[11] Porter, *Health, Civilisation and the State,* pp. 168-182; Berridge*, Public Health*, p. 58.
[12] Porter refers to G. Jones, *Social Hygiene in Twentieth Century Britain* (London, 1986) in D. Porter, '"Enemies of the Race": Biologism, Environmentalism and Public Health in Edwardian England', *Victorian Studies,* 34, 2 (1991), pp. 159-178, pp. 162-163.
[13] C. Renwick, 'Eugenics, Population Research, and Social Mobility Studies in Early and Mid-Twentieth-Century Britain', *The Historical Journal,* 59, 3 (2016), pp. 845-6., pp. 849, 848
[14]P. L. Garside, '"Unhealthy Areas": Town Planning, Eugenics and the Slums, 1890–1945', *Planning Perspectives,* 3, (1988), pp. 24-46, p, 42. J. Welshman, 'Eugenics and Public Health in Britain, 1900-40: Scenes from Provincial Life', *Urban History*, 24, 1 (1997), pp. 56-75, p. 56.

This study looks more closely at the influence of eugenics at the local level by exploring to what extent there was engagement with eugenic ideas by the MOH and those administering local government.[15]

Marjaana Niemi's study into urban municipal public health policy compares Birmingham with Gothenburg in Sweden and focuses on multiple social interventions in the first decades of the twentieth century, where MOHs played a crucial role. Niemi explores housing, mother and child welfare and tuberculosis in both municipalities and identifies differing approaches in dealing with the physical environment, with Birmingham's focus on 'unhealthy areas' or slums and Gothenburg authorities' focus on people and houses.[16] Although Niemi offers valuable detail on municipal policy in Birmingham and highlights its targeting towards the individual and, in particular, the mother and child, there is a lack of discussion on the potential influences for that policy.

In addition to Mooney and Niemi, there are other studies that have included or specifically explored the work of Birmingham's MOHs.[17] Mostly they focus on a single

[15] Birmingham Archives and Collections, Library of Birmingham (BAC), L50.7/220665, Birmingham and Edgbaston Debating Society Addresses, Valedictory Address by Albert Lucas, 'Heredity and Eugenics', 29 September 1909; Bham Inst/D27/229788, Birmingham Heredity Society, tickets, circulars and cuttings 1911; L50.6/237900, Annual reports of Birmingham Heredity Society 1910/11; 1911/12; 1912/13; 1913/14.

[16] M, Niemi, 'Public Health Discourses in Birmingham and Gothenburg 1890-1920' in S. Sheard and H. Power (eds), *Body and City: Histories of Urban Public Health* (Aldershot, 2000), pp. 123-142; M. Niemi, *Public Health and Municipal Policy Making: Britain and Sweden, 1900–1940 (*Aldershot, 2007).

[17] N. Williams and G. Mooney, 'Infant Mortality in an 'Age of Great Cities': London and the English provincial cities compared, c. 1840-1910', *Continuity & Change*, 9, 2 (1994), pp. 185-212; Niemi, 'Public Health Discourses in Birmingham and Gothenburg'; C. Galley, 'Social intervention and the Decline of Infant Mortality: Birmingham and Sheffield c. 1870-1910', *Local Population Studies*, 73 (2004), pp. 29-50; C. Galley, 'Health Visitors: How much difference did they make? – a reply to Michael Drake', *Local Population Studies*, 76 (2006), pp. 69-75; Niemi, *Public Health and Municipal Policy Making*; J. Wacher, "'Lessening Our Greatest Scourge": Management of the Tuberculosis Milk Problem in Birmingham at the Turn of the Nineteenth Century: Midland History Prize Proxime Accessit 2006', *Midland History,* 33, 1 (2008); R. J. Procter, 'Infant Mortality: A Study of the Impact of Social Intervention in Birmingham 1873 to 1938', (Unpublished MPhil Thesis, University of Birmingham, 2011); John Robertson's efforts to tackle TB while MOH for Sheffield (his post before Birmingham) are discussed in G. Mooney, *Intrusive Interventions: Public Health, Domestic Space and Infectious Disease Surveillance in England,*

public health issue such as infant mortality or tuberculosis (TB). Various methodological approaches have been used to assess the effectiveness of the social interventions to tackle these problems. Chris Galley analysed MOH reports to compare the decline in Infant Mortality Rates (IMR) between Birmingham and Sheffield.[18] In contrast, Ruth Procter's broader examination of infant mortality specifically in Birmingham also considered the social interventions of the voluntary sector.[19] Galley's and Procter's separate studies lay a considerable portion of personal blame with Birmingham's first MOH for his attitude and ineffectiveness at tackling Birmingham's high IMR.[20] They consider that Hill 'failed the infants of Birmingham' and that he 'distanced himself from any responsibility'.[21] In contrast, Robertson is more celebrated for his 'campaigns' on infant mortality, TB, and housing, although these were a key focus for all MOHs and authorities at that time.[22] This suggests that assessments were made under the assumption that MOHs held substantial powers to impact the heath of the city and influence council policy; this chapter explores the truth or otherwise of that assumption.

On the problem of infant mortality more broadly, Naomi Williams and Graham Mooney investigate the causes in English provincial cities and include statistical data

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1840-1914. (Rochester, New York, 2015), pp. 159-162; D. Low, 'Infant Mortality' in Friends of Birmingham Archives and Heritage (FoBAH), *Born in Birmingham: Maternity, Midwives & Infant Welfare 1914-1924* (Birmingham, 2020), pp. 8-9. John Robertson's report on Child Welfare in 1913 is discussed and Low, a retired consultant paediatrician and FoBAH volunteer, recalculated and reinterpreted MOH reports (1914-1924) to attempt to answer whether Robertson was successful in reducing infant mortality.

[18] Galley, 'Social Intervention'. Since that paper, Galley has continued to research infant mortality and has produced a recent book that now considers some of the more recent research referred to throughout this thesis; C. Galley, *Infant Mortality in England, 1538-2000* (Local Population Studies Society, 2023).

[19] Procter, 'Infant Mortality'.

[20] Galley, 'Social intervention', pp. 30, 33; Procter, pp. 153-158.

[21] Galley cited in Procter, p. 157.

[22] 'Death of Sir J. Robertson', *Birmingham Daily Gazette*, 17 December 1936; S. Sturdy, 'Robertson, Sir John (1862-1936)', *Oxford Dictionary of National Biography (ODNB)* available at https://doi.org/10.1093/ref:odnb/57203 [accessed 15 August 2023].

from Birmingham. Although their study did not seek to offer 'any new answers', it highlights 'interpretive difficulties' due to variability in levels of infant mortality between English towns between 1840 and 1910. Instead, Williams and Mooney looked for patterns, such as 'the extent to which towns behaved in a similar manner over time'.[23] Williams and Mooney's findings expanded and broadly agreed with an earlier study by R. I. Woods, P. A. Watterson and J. H. Woodward into the rapid decline in infant mortality between 1861 and 1921.[24] In particular, they considered the effect of long hot summers and each town's specific environmental management methods.[25] There are several local studies of late nineteenth- and early twentieth-century infant mortality, including Barbara Thompson's on Bradford and Naomi Williams' on Sheffield highlighting both socio-economic status and environmental conditions. Nigel Morgan's work on Preston has already been discussed in Chapter Six and research by Galley, Williams and Mooney, and Morgan has been influential in shaping studies of Hemsworth (Yorkshire) and Dublin (Ireland) and others covering English counties, such as Durham.[26] Chapter Six of this thesis build upon these studies by further demonstrating the impact of the chosen methods of waste

[23] Williams and Mooney, p. 186.
[24] Williams and Mooney expanded and broadly agreed with a study by R. I. Woods, P. A. Watterson and J. H. Woodward, 'The causes of rapid infant mortality decline in England and Wales, 1861-1921. Parts I and II', *Population Studies*, 42 (1988), pp. 343-366, and *Population Studies,* 43 (1989), pp. 113-132, which included Birmingham in the analysis.
[25] Williams and Mooney, pp. 205-207.
[26] Studies are too numerous to list exhaustively here but key works consulted include: B. Thompson, 'Infant Mortality in Nineteenth-Century Bradford' in R. Woods and J. Woodward (eds), *Urban Disease and Mortality in Nineteenth-Century England* (London, 1984), pp. 120-147; N. Williams, 'Death in its Season': Class, Environment and the Mortality of Infants in Nineteenth-Century Sheffield', *Social History of Medicine*, 5 (1992), pp. 71-94; N. Morgan, 'Infant Mortality, Flies and Horses in Later-Nineteenth-Century Towns: A Case study of Preston', *Continuity and Change*, 17 (2002), pp. 97-132; L. M. Davies, 'The Conquest of Infant Mortality: The Case of Hemsworth, 1871-1911' (Unpublished PhD Thesis, The Open University, 2007): C. Breathnach and B. Gurrin, 'A Tale of Two Cities: Infant Mortality and Cause of Infant Death , Dublin 1864-1910', *Urban History*, 44, 4 (2017), pp. 647-677; D. Bonham, 'From the Mouth of Babes: Infant Mortality and Medicalised Motherhood in County Durham, England, 1892-1914' (Unpublished MA Thesis, University of Saskatchewan, 2018) – this latter was of interest as it refers to the county MOH, T. Eustace Hill, son of Alfred Hill.

management and the connection with the annual plague of flies in the summer months. This chapter adds to these findings by considering medical knowledge at the end of the nineteenth century and reassesses some of the earlier interpretations and conclusions about Birmingham's MOHs' efforts to tackle infant mortality.

The chapter begins by looking at the MOH role and the medical background of Hill and Robertson, before assessing their individual tenures to establish how their medical knowledge translated into medical practice, drawing out primary focuses, challenges and contributions. It then reviews previous assessments of social interventions for infant mortality before drawing conclusions on the impact and influence of Birmingham's first two MOHs.

The Medical Officer of Health for Birmingham

Martin Gorksy describes the role of the MOH as a varied one. Primarily in the nineteenth century it encompassed not only medical aspects such as disease and causes of death, but also the physical environment and what effects that had on the health of the public.[27] Public health medicine changed markedly from the early 1870s due to legislation that brought a change in central government control from the Privy Council to the Local Government Board (LGB).[28] Other studies have focused on the tenure of an individual MOH, or the work of MOHs in a particular place.[29]

[27] M. Gorsky, 'Local Leadership in Public Health: The Role of the Medical Officer of Health in Britain, 1872-1974', *Journal of Epidemiology and Community Health,* 61, no. 6 (2007), pp. 468-472, pp. 468-469.
[28] Worboys, *Spreading Germs*, p. 110.
[29] A. Wilkinson (now Hardy), 'The Beginnings of Disease Control in London : the Work of the Medical Officers in Three Parishes, 1856-1900', (Unpublished PhD Thesis, University of Oxford, 1980); A. Tanner, 'Thomas Orme Dudfield: The Model Medical Officer of Health', *Journal of Medical Biography*, 6 (1998), pp. 79-85; D. Amos, 'Prevention is better than cure': the work of the early Nottingham Medical Officers of Health, 1873-1929',

MOHs became compulsory for all sanitary authorities from 1872, but there are only a few major biographical studies, for example, those relating to John Simon, the first Chief Medical Officer (CMO), Arthur Newsholme, MOH for Brighton and the LGB, John Niven, MOH for Oldham then Manchester, and Edward Ballard, MOH for Islington and the LGB.[30] A search of the *Oxford Dictionary of National Biography* database for the specific occupation title 'MOH' produces only eleven entries, and yet a broader search removing the exact job title offers over 100 entries, including physicians and epidemiologists who at one time served as MOH in a locality. MOHs active in the twentieth century are more often referred to as public health administrators, as is the case for Robertson.[31]

MOHs were shaped by their medical education, prevailing theories of disease and approaches to medical practice. Those active from the mid-nineteenth to the first decades of the twentieth century had to navigate changing theories and ideas during their careers.[32] Using a variety of sources, the following sections place each MOH in their correct context in terms of disease theories and medical practice and then look

Journal of the Royal Institute of Public Health, 122 (2008), pp. 568-577; A. Grace, 'Liverpool's Dr Duncan – Britain's First Medical Officer of Health', *Culture Liverpool* (2023) available at https://www.cultureliverpool.co.uk/liverpools-dr-duncan-britains-first-medical-officer-of-health/ [accessed 12 August 2023].

[30] A. Lambert, *Sir John Simon and English Social Administration* (London, 1965); also the biographical entry by C. Hamlin, 'Simon, Sir John (1816-1904), *Oxford Dictionary of National Biography* (*ODNB)* http://doi.org/10.1093/ref:odnb/36097 [accessed 17 June 2020]; J. Eyler, *Sir Arthur Newsholme and State Medicine* (Cambridge, 1997); J. Mottram, 'Niven, James (1851–1925)', *ODNB,* available at https://doi.org/10.1093/ref:odnb/57128 [accessed 15 August 2023]; S. Sheard and L. Donaldson (Sir), *The Nation's Doctor: The Role of the Chief Medical Officer 1855-1998* (Oxford, 2006); J. Steere-Williams, 'Edward Ballard and the Practice of Epidemiology in the 19th-Century United Kingdom', *American Journal of Public Health,* 108, 12 (2018), pp. 1632-1638.

[31] The *ODNB* database https://www.oxforddnb.com/; Sturdy, 'Robertson, Sir John'. There is no entry in *ODNB* for Dr Alfred Hill.

[32] Also see Appendix 1: Index of persons for biographical information on Hill and Robertson.

more closely at their tenures and what each brought to the role, and their impact on the health of the city.

Medical Backgrounds

Joan Lane offers a useful overview of medical practitioners eighteenth- and nineteenth-century England, highlighting the various paths of training and qualifications before a more 'structured system of medical education' emerged.[33] The different pathways also meant separate licensing bodies for surgeons, apothecaries and physicians, and Roy Porter discusses the resulting frictions in the early nineteenth century and the professionalisation and standardisation of medical practice, training and licensing. The Medical Act of 1858 brought the medical register of approved medical men (not women at that time), and this registration was necessary for public employment.[34]

Hill held the position of Borough Analyst for eleven years before he was appointed MOH after the Public Health Act 1872. He had an interest in chemistry as a schoolboy and was articled to his uncle, a surgeon in Staffordshire, at the age of sixteen. He passed his examinations for the Royal College of Surgeons and Society of Apothecaries in 1851 and took his doctorate in medicine at Aberdeen in 1854. Following his MD qualification, Hill was able to register after 1858 and was already practising, teaching and employed in a public post before the appearance of special postgraduate diploma courses in public health from about 1870. However,

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[33] For more about medical training in the early nineteenth century, see J. Lane, chapter 1 'Medical Practitioners in Eighteenth- and Nineteenth-Century England' in *A Social History of Medicine: Health, Healing and Disease in England, 1750-1950* (London, 2001), pp. 11-31, p. 29. Also, J. Lane, *The Making of the English Patient: A Guide to Sources for the Social History of Medicine* (Stroud, 2000), particularly 'Medical Apprenticeship and Training', pp. 1-30.

[34] R. Porter, *The Greatest Benefit to Mankind: A Medical History of Humanity from Antiquity to the Present* (London, 1997), pp. 354-358.

specialised qualifications in public health did not become mandatory for new appointments until 1892.[35] One of Hill's posts as Chair of Chemistry and Toxicology at Birmingham's Sydenham College Medical School, later Queen's College, was influential for his appointment as Analyst and he retained this teaching post until 1876, when the MOH role was made exclusive and full-time. To entice Hill to give up all his other commitments and devote all his energies exclusively as Analyst and MOH for Birmingham, he was paid a salary of £1000 which, Mooney points out, was 'probably greater and more secure than any of his provincial colleagues'.[36]

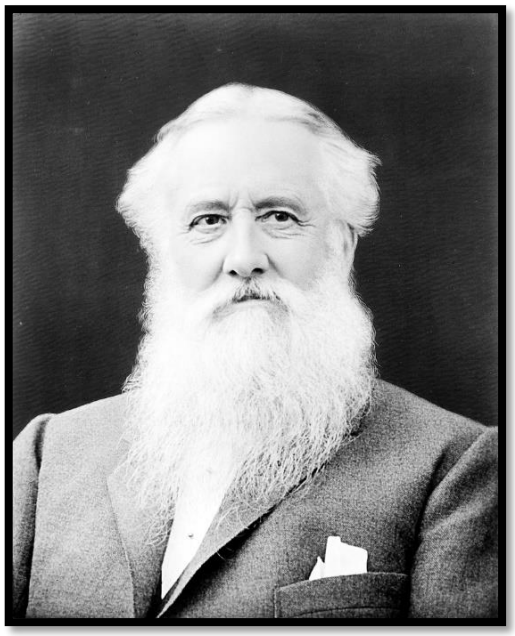


Figure 8.1: Portrait of A. Hill, 1826-1922. President of the Society of Medical Officers of Health 1886-1888.

From the photograph in the Society. Medical Officer of Health of the City of Birmingham 1872-1903. Wellcome Collection. Attribution 4.0 International (CC BY 4.0).

[35] Lane, *A Social History of Medicine*, p. 29; Worboys, *Spreading Germs*, p. 110.
[36] Mooney, *Intrusive Interventions*, pp. 54-5. For the MOH role in Birmingham the salary was £850.00, and this was supported with a grant from the Local Government Board.

Over a long career Hill produced numerous council reports, sanitary surveys and special investigations for the city's 1871 Sewage Inquiry and 1875 Improvement Scheme. Hill's published papers reveal his interests and equally which issues were principal problems in Birmingham: water supply; house drainage; sewage disposal and crops grown on sewage farms; infectious diseases such as diphtheria and smallpox; and infant mortality.[37] Professionally, Hill was well respected by his peers and he became a founder member and president of the Society of Public Analysts and president of the Society of Medical Officers of Health (SMOHs). At his presidential address to the SMOHs in 1888, Hill stressed the need for compulsory legislation in many areas of public health, firmly believing that the SMOHs were strongly positioned to bring pressure on the government to act accordingly.[38] At the time of his death in 1922 at ninety-five he was the oldest surviving English public analyst and oldest member of the British Medical Association, having been elected in 1853.[39] Through active participation in professional societies and their regional branches, Hill kept himself informed on relevant theories and practice and often included this new knowledge in his annual reports, offering councillors details of schemes in other towns, plus reports from prominent MOHs such as Simon or Ballard.[40] Worboys points out that as MOHs were always looking for the causes of

[37] A. Hill, *What is the relation of water supply in large towns to the health of the inhabitants?* (Birmingham, 1868); BAC Lp45.32/233600, A. Hill, *The Dangers of Defective Drainage* (Birmingham, 1883). Various articles include A. Hill. 'Milk Standards', *The Lancet*, 20 May 1876; 'Remarks on Sewage-Farm Milk and Butter', *The Analyst* (August 1885); Proceedings of The Society of Public Analysts**:** 'Polluted Drinking Water and the Closure of Wells', *The Analyst* (August 1888), pp. 141-149; 'Infantile Mortality in Birmingham'*, Public Health*, 6. 66 (1893); 'Some remarks on Diphtheria', *The Lancet*, 12 September 1896.
[38] Hardy, 'Public Health and the Expert', p. 132.
[39] 'Alfred Hill, M.D, Formerly Medical Officer of Health for Birmingham', *British Medical Journal*, Vol 1 No. 3193 (Mar 11, 1922), pp. 417-8; Obituary: Alfred Hill, *The Analyst*, Vol. XLVII., No. 555 (June 1922).
[40] A. Hill, *Annual Report of the Medical Officer of Health for Birmingham 1873-1903* (hereafter *Report [year]*) available via the Wellcome Library see https://wellcomelibrary.org/moh/about-the-reports/about-the-medical-officer-of-health-reports/ [accessed 26 August 2023].

contagious disease and were responsible for its control in the community, they were far more open to evolving theories on germs and contagions than private practitioners.[41] Many, as Barnes suggests, merged old and new theories with dirt- and filth-proliferating 'poisons' or bad air alongside living germ theories in the wake of new diseases like cholera.[42] For instance, there was growing medical understanding between the 1870s and 1890s that infected milk supplies could spread diseases such as diphtheria, typhoid, scarlet fever and, significantly, tuberculosis (TB).[43]

In contrast, Robertson became an MOH for the first time in 1891, almost twenty years after Hill. Robertson's first post was at St Helens, Merseyside, and then at Sheffield before taking the post at Birmingham towards the end of 1903.[44] Robertson pursued a more formal training pathway (including bacteriology) and qualified as MD at Edinburgh University in 1887. His thesis was entitled 'The distribution of phthisis in England', based on a statistical analysis of tuberculosis mortality returns that he conducted at the Museum of Hygiene in London.[45] He gained another degree in Public Health in 1889, and so had the necessary qualifications before they became compulsory. Robertson represented the new generation of public health professionals as the understanding of diseases, such as TB, changed from 'heredity to infection'. As Worboys explains, previously TB had been considered an ' inherited,

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[41] Worboys, *Spreading Germs,* p. 112.
[42] Worboys, *Spreading Germs,* pp. 112-113; Barnes, pp.134-135.
[43] Both Anne Hardy and Joseph Wacher offer explanations of the different forms of TB, caused by the bacillus *Mycobacterium tuberculosis,* as discovered by Robert Koch in 1882. There are five types, but only two (human and bovine) cause disease in humans; see Hardy, *The Epidemic Streets: Infectious Disease and the Rise of Preventative Medicine* (Oxford, 1993), p. 212; J. Wacher, "'Lessening Our Greatest Scourge"', pp. 115-30. Also see Hardy, *The Epidemic Streets,* pp. 78-9, 90-1, 157, 159, 167, 212 for milk and other diseases.
[44] No image of Robertson was traced via the Wellcome Collection or Birmingham Archives and Collections, Library of Birmingham (BAC). A photograph exists that is reproduced in articles which presumably is from a personal collection. This photograph can be seen in 'Obituary', *The Lancet*, 228, 26 December 1936.
[45] *The Lancet*, 228, 26 December 1936.

constitutional condition', and therefore not a public health disease of concern to earlier MOHs.

After Hill's retirement, Robertson inherited the city's large department at a starting salary of £1000 per year, rising to £1200 in 1908.[46] Robertson's personal publications and special reports to the council demonstrate that his early research interests were focused primarily on infant mortality, TB and milk supply. Later, his attention was absorbed by housing and town planning.[47] Robertson was professor of Public Health and Bacteriology at Sheffield University before taking the post of Professor for Hygiene and Public Health at the University of Birmingham, in which role he continued after his retirement as MOH in 1927. Professionally well-respected during his career, he served as president of the SMOHs between 1916 and 1917 and was a specialist medical advisor during the First World War. He was a member of consultative committees for the new Ministry of Health and was awarded an OBE in 1919 and knighted in 1925.[48]

Birmingham's MOHs need to be understood through their medical education and specialisms, as well as their interests and professional networks. Hill followed a

[46] BAC, Birmingham City Council Collection (BCC), BCC1/AR/1/1/26, Health Committee Minutes 1908-1910, 29 July 1908.
[47] J. Robertson, *Annual Report of the Medical Officer of Health for Birmingham 1904-1926* (hereafter *Report [year]*) available via the Wellcome Collections https://wellcomecollection.org/collections; BAC, L45.11/185257, J. Robertson, *Special Report of the MoH on Infant Mortality in the City of Birmingham* (Birmingham, 1904); Various other reports can be found in the minutes of the Health/Public health and Housing Committees or with annual MOH report, *Further Measures for the Prevention of Consumption in the City of Birmingham* (1906); BAC AX310 / Vol 35 / 212402, *Salterley Grange Sanatorium* (1908); BAC Birmingham Corporation Documents E/6 / 219066, *Report on the Spread of Tuberculosis by Indiscriminate Spitting* (1909); BAC AX310/Vol 19/223791, *Report on the Industrial Employment of Married Women and Infantile Mortality* (1910), BAC L/acc./524284, *The Milk Supply: Report on a Visit to American Cities in Regard to Milk Supply* (1922); J. Robertson, *Housing and Public Health* (London, 1919); J. Robertson, *The House of Health: what the Modern Dwelling Needs to Be* (London , 1925); Professor Sir John Robertson, 'The Slum Problem', *Journal of the Royal Sanitary Institute* (51) 1930-1931, pp. 279-84.
[48] 'Death of Sir J. Robertson', *Birmingham Daily Gazette*, 17 December 1936; Sturdy, 'Robertson, Sir John'.

broader path than Robertson to become medically qualified and had a keen personal interest in chemistry. As an MOH, Hill was a practitioner of sanitary science, his career ending as bacteriology was changing medical practice. In contrast, Robertson was at the forefront of the new bacteriology generation and had specialised in public health. The following sections look more closely at each man's tenure to explore how their training and specialisms translated into MOH practice and impacted the health of the city.

The Hill Era, 1872-1903

Worboys classifies public health medicine between 1866 and 1880 as being based on sanitary science, which broadly encompassed statistics, chemistry, meteorology, geology as well as medicine. The 'cornerstone' of this science was 'epidemiology'.[49] This is explained by Jacob Steere-Williams as the practice of MOHs locating where disease exists and then formulating reasons why it was present there.[50] Once this process was completed, preventative measures could be put in place. Jonathan Reinarz summarises some of the key features of the period when Hill was MOH for Birmingham as: the closing of contaminated wells, improvements in the quality of food sold at markets, and attention to outbreaks of infectious disease.[51]

In his first annual report to the council for 1873, Hill made comparisons between Birmingham and other large towns and included considerable statistical information. The sections of that report reveal the major concerns of the city's first MOH: the need

[49] Worboys, *Spreading Germs*, p. 111; most recently see J. Steere-Williams*, The Filth Disease: Typhoid Fever and the Practice of Epidemiology in Victorian England* (Rochester, 2020).
[50] Steere-Williams, 'Edward Ballard', p. 1365.
[51] J. Reinarz, 'Industry and Illness: Investing in Health and Medical Provision', in C. Chinn and M. Dick, *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 239-259, p. 254.

for an isolation hospital; sewage and waste disposal issues; water supply and polluted wells; and poor ventilation in certain types of housing.[52] Hill noted that Birmingham's overall death rate was lower than that of most large towns, a point which had often been made by councillors to defend conditions in the city. However, Hill emphasised that overall figures did not present a true picture and highlighted that it was completely the reverse in terms of zymotic or infectious disease, where Birmingham had one of the highest rates in comparison with other large towns.[53] As Reinarz highlights, in the early years of Hill's tenure approximately forty-three per cent of deaths in Birmingham 'resulted from six diseases: measles, scarlet fever, whooping cough, typhoid fever, diarrhoea and phthisis'.[54] There could be variation depending on prevalent epidemic disease, for example, Hill's first annual report for 1873 reveals there were 8,990 deaths in Birmingham with diarrhoea the 'most destructive' cause at 728 deaths; followed by 587 deaths from scarlet fever; 203 from fever, 169 from whooping cough; 125 from smallpox; 123 from measles; 107 from diphtheria.[55] This high zymotic disease rate saw Hill push through his plans for the prevention of infectious disease through notification, isolation and disinfection. Before the end of 1876, the following were operational in the town: a voluntary notification scheme, before it became compulsory in 1899; the establishment of a fever hospital (the Borough Hospital) to isolate patients; and a permanent disinfection station.[56]

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[52] Hill, *Report 1873*.
[53] Hill, *Report 1873*. See Appendix 3 for Overall Death Rates.
[54] Reinarz, 'Industry and illness', p. 254.
[55] Hill, *Report 1873*, p. 6. Fever at this point was classified as typhoid, typhus and 'simple continued'.
[56] Reinarz, 'Investing in Health and Medical Provision', p. 254. For more information on notification and disinfection, see Mooney, *Intrusive Interventions,* pp. 54-57, 143.

Another medical focus for Hill was the closure of Birmingham's polluted shallow wells (see Chapter Five) and, as a keen chemist, Hill's reports featured extensive water analyses. At a time of debate over best analysis methods, Hill openly declared in his first report his preference for the 'Frankland and Armitage' method and reproduced Edward Frankland's explanations for the term 'previous sewage or animal contamination'.[57] As the city's Analyst, food safety was also a major interest: Hill expressed serious concern at Birmingham having 301 private slaughterhouses and suggested emulating the example of Paris and Manchester by establishing one or two large municipal abattoirs instead.[58] His continued advocacy for municipal abattoirs over many years suggests that meat unfit for consumption was a problem in Birmingham which had too many slaughterhouses to inspect properly. Hill also pushed for public baths to be made cheaper for the poorest, on the basis that if they were more affordable, more people would use them.[59] The amount of sanitary work required became evident after the Sanitary Survey of 1875; Hill's inspection department increased to thirty-eight and sanitary work remained a prominent feature throughout his tenure.[60]

Each year, Hill's annual reports featured more sections outlining new obligations in response to legislation or expatiating more extensively on a particular problem that

[57] Hill, *Report 1873*, pp. 17-19. See C. Hamlin, *A Science of Impurity: Water Analysis in Nineteenth Century Britain* (Bristol, 1990) and C. A. Russell, 'Frankland, Sir Edward (1825-1899)', *ODNB*, https://doi.org/10.1093/ref:odnb/10083 [accessed 23 August 2023]. See also chapter 2, J. Steere-Williams, 'A Good Working Theory: Water and the Methods of Outbreak Investigation before 1860' in *The Filth Disease*, pp. 77 – 127.

[58] Hill, *Report 1873,* p. 20.

[59] Hill, *Report 1873*, p. 20.

[60] Mooney, *Intrusive Interventions*; note that on p. 55 Mooney refers to 38 sanitary inspectors – there were 38 staff in department but that included the chief inspector, 16 Sanitary Inspectors, 2 Lodging House Inspectors, 2 Smoke inspectors, 1 Removing inspector and 16 Whitewashers and disinfectors. The removing inspector role was to remove infectious patients to isolation at the hospital.

year.[61] As Chapter Seven revealed, by 1901 the health department had expanded considerably, with activities separated into hospital staff, the sanitary section and nightsoil and interception. Although Hill's late nineteenth-century role may have been typical of that of other MOHs, this thesis has emphasised just how much his role and any initiatives were framed by Birmingham's environmental difficulties with sewage pollution, waste management, water supply and the poor quality of the city's back-to-back housing.

Enid Gauldie suggests that late nineteenth-century legislation for housing introduced within the framework of public health may have been part of the drive to prevent disease but was also 'restrictive and destructive'.[62] With the focus on closure and demolition, there was little policy to 'construct or create' before the inter-war years. Housing problems were not addressed by sanitation improvements and the problem became more acute.[63] Hill's sanitary section was never large enough to cope with the constant problems within the city's courts but sanitary work was the only tool at his disposal to deal with poor housing.[64] In the last decade of the nineteenth century and first decade of the twentieth century 'the housing question' was a contentious issue within the council.[65] The Health Committee and Hill were criticised in 1901 after the *Scenes in Slum Land* scandal and a deputation by local clergy demanding that the

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[61] Examples of extended reports included epidemics, infant mortality, mortuaries, public baths or sanitary censuses. For an overview of public health in Birmingham during Hill's time, see council histories: J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885*),* pp. 95-151; C. A. Vince, *History of the Corporation of Birmingham, Vol. III* (Birmingham, 1902), pp. 105-136; C. A. Vince, *History of the Corporation, Vol. IV* (Birmingham, 1923), pp. 127-132.

[62] E. Gauldie, *Cruel Habitations: A History of Working-Class Housing 1870-1918* (London, 1974), p. 141.

[63] Gauldie, p. 141.

[64] Hill, *Report 1897.* Hill refers to the demolition of all bad housing and building of new homes but points out that this was simply too costly. Sanitary work included the removal of nuisances, whitewashing, ashpits and drains. Hill's annual reports list the amount of sanitary work completed for that year offering insight into what sanitary work involved.

[65] For more on the housing question, see Vince, *History of the Corporation III*, pp. 351-363.

council do something about conditions.[66] However, Hill's response was that he could close many houses but where would the tenants go if there were no new houses cheap enough for workers to rent? He argued that they would move into the remaining courts and Hill considered that overcrowding and house-sharing in existing poor properties would be more dangerous in terms of spreading disease.[67] With the council following a non-interventionist housing policy, Hill suggested towards the end of his career the demolition of some end houses to open up the courts and increase ventilation as a prelude to improving the remaining houses in any way possible.[68] This was the policy adopted by the council in the Robertson era (see Fig. 8.3 for an example shown in the MOH Report for 1904). The physical environment dominated Hill's work as MOH, and therefore it is unsurprising that Hill linked it so prominently to health, even if he did not fully understand the dynamics of that relationship.

At the same time, Hill was not ignorant of the changes in theories of disease and practice as he continued to be active in professional societies where the latest theories and developments in bacteriology were shared. On Hill's recommendation, the new medical practices of diphtheria testing and antitoxin treatment were introduced to Birmingham's citizens in 1897.[69] However, that did not mean that Hill had abandoned sanitary science altogether, as there is evidence of what Barnes'

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[66] See Chapter Six. *Birmingham Daily Gazette* investigated the conditions in Birmingham's slums. In 1901 it published a series of articles, *Scenes in Slum Land*, which detailed the dreadful living conditions and accused the chair of the Health Committee, Alderman Cook, of being 'a slum landlord'. Cook sued for personal damages and won a small payout. The Health Committee produced a report answering some of the key issues raised at that time when a deputation of clergy chaired by the Bishop of Worcester urged the council to enquire into and act over the sanitary state of the poorer parts of the city. BAC, BCC/1/AR/1/1/22, Minutes of the Health Committee, June 1901 - Oct 1902; BAC LF41.8 / 156671, J. C. Walters, *Scenes in Slum Land*, *Pen Pictures of the Black Spots in Birmingham*, 2 volumes (Birmingham, 1901).
[67] BAC, BCC1/AR/4/1, Health Committee sub-committee records
[68] Hill, *Report 1897*, p. 25; Niemi, *Public Health and Municipal Policy*, p. 74.
[69] Vince, *History of the Corporation III*, pp. 108-136. Hardy, 'Diphtheria' in *Epidemic Streets*, pp. 80-109.

suggests was commonplace practice in the 1890s, namely the 'sanitary-bacteriological synthesis' (SBS) and the 'marriage' of the old and new. Hill's address at the conference of MOHs in Newcastle in 1896 offers a 'composite example' in action.[70] Hill admitted that he was 'at a loss to account for the sudden increase' in cases of diphtheria in Birmingham. He discussed the history of the disease, explaining that his investigations explored possible links to elevation, waste management and school attendance but at the end of his address he suggested that the best course of action for prevention was to:

> embrace notification, isolation, exclusion of diphtheria cases from scarlet fever wards, disinfection of clothing, bedding, furniture etc, strictly regulated school attendance, supervision of milk supplies and the boiling of all milk, removal of dampness, darkness and other insanitary conditions from sites and dwellings; careful observation of cases of sore-throat, however mild; the destruction, or […] disinfection of sputa; and finally bacteriological examination of all cases of sore-throat and […] bacterial cultivation during convalescence […] until the microbe can no longer be detected.[71]

The following year, Hill returned to explanations of climate and sanitary conditions as the cause of the city's diarrhoea epidemic and referred to a report by Ballard on the density of buildings and deficiency of ventilation. He quoted Ballard's view that better ventilation of 'polluted air' would 'lessen the energy of a present contagium'.[72] This suggests that the reason for the SBS and the gradual transition, rather than a 'bacteriological revolution' as argued by Worboys, is because MOHs on the ground – such as Hill and Ballard in their everyday practice – were still dealing with much

[70] Barnes, *The Great Stink of Paris*, pp. 134-135. The composite example is the integration of practices for filth and germs with a new germ-centred focus on contamination and laboratory testing for microbes.
[71] Hill, 'Some Remarks on Diphtheria', *The Lancet*, 3811, 12 September 1896.
[72] Hill, *Report 1897*, p. 24. Ballard was obviously the inspiration for Hill's suggestion to remove houses to increase ventilation in the courts.

environmental sanitary work at the close of the nineteenth century.[73] This view supports Barnes' argument that the very act of labelling the synthesis of new and old aetiologies emphasises the importance of understanding just how contemporary practitioners understood disease.[74]

Hill's 1899 MOH annual report offers an example of epidemiology in practice and how MOHs identified links to how disease was spread and yet fell short of a complete understanding (vectors of transmission are discussed later). In the report Hill argued for the abolition of the pan privy, convinced that it was the cause of higher death rates from typhoid fever and diarrhoea. He produced a graph to highlight the difference in death rates between the wards correlated against the number of WCs in each ward (see Fig. 8.2) and suggested that the council should bear some of the costs of conversion.[75] Two of the city's unhealthiest areas, the wards of St. Mary's and St. Bartholomew's, as discussed in Chapter Six, showed the highest death rates and had the lowest number of WCs. Here is evidence of Worboys' suggestion that reports were used as political documents 'intended to shame local authorities and galvanise action'.[76] However, as this study has revealed, specific local conditions and municipal policy often prevented *non-medical* remedial action, thus hampering the efforts of the MOH in making any significant impact on health. In 1899, the Elan Valley Scheme was over budget, the water supply was under immense pressure, and the council still

[73] Worboys, *Spreading Germs*, p. 278; Barnes, *Great Stink of Paris*, p. 134-139.
[74] Barnes, p.134.
[75] Hill, *Report 1899*. There was a similar situation in Nottingham, where the city's MOH also linked pail closets to higher death rates by making a comparison to Leicester where water closets were being adopted more quickly see Amos, 'Prevention is better than cure', p. 573.
[76] Worboys, *Spreading Germs*, p. 112.

operated under a non-interventionist policy that might have supported a more rapid transition to WCs.

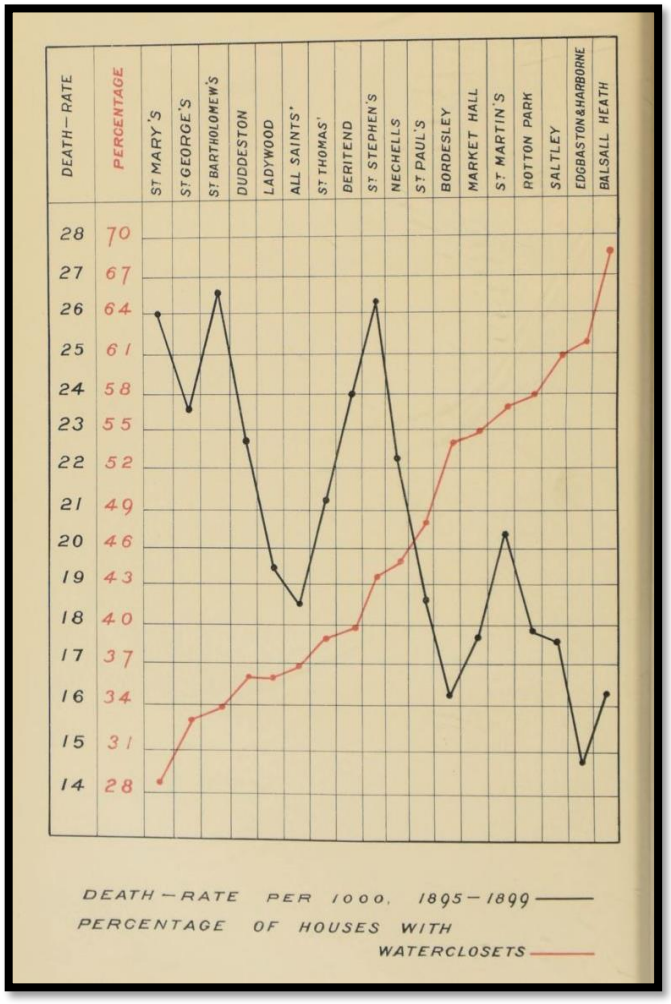


Figure 8.2: Graph showing death rate per 1000 for each ward between 1895 and 1899 compared with the percentage of houses with WCs.

[Report 1899] / Medical Officer of Health, Birmingham. Wellcome Collection. Public Domain Mark

Hill resigned on 30 June 1903 at the age of seventy-six after forty-four years' service as Analyst and MOH and enjoyed a long retirement on the Isle of Wight. When Hill's

tenure ended, he was not in post when the answer to the city's sanitation problems arrived with the new water supply from Wales. Hill left a large municipal health department staffed heavily for the sanitary work required (Chapter Seven): much housing in Birmingham remained poor whilst the council pursued a largely non-interventionist approach towards housing improvement, believing that matters should be left to landlords and private enterprise. Hill was a local resident, practising and teaching in the city before his appointment. The next MOH was not appointed locally and brought experience working as a MOH for other localities; he was one of the new generation of public health administrators who had been trained in bacteriology.

The Robertson Era, 1904 - 1927

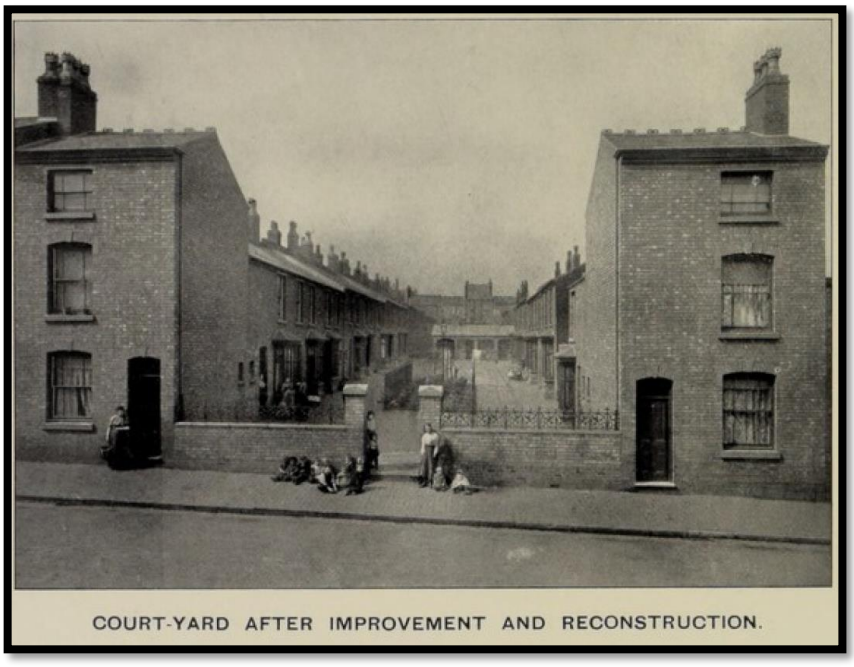


Figure 8.3: Courtyard Improvements in Birmingham, 1904.

Shows the opening-up of the courts with removal of end houses. Wellcome Collection. Attribution 4.0 International (CC BY 4.0)

Joseph Wacher and Graham Mooney discuss Robertson's earlier MOH work at St. Helen's and Sheffield, shaped by his early training in bacteriology and specialist interest in TB.[77] Robertson quickly continued this work on TB at Birmingham, but another early focus was infant mortality.[78] In his 1904 special report on infant mortality Robertson suggested attending to the city's milk supplies, following on from his work at Sheffield. [79] As Wacher suggests, Robertson may have seen cleaning up Birmingham's milk supply as an appropriate solution to tackle both infant mortality and the spread of bovine TB.[80] Initially, Robertson had planned to introduce infant milk depots in Birmingham, as a means to encourage parents to feed their children 'good milk', but this was dropped after trial milkshops revealed depots 'did not pay their way'.[81] Consequently, his attention focused on the prevention of milk supplies becoming infected with TB. Wacher's study details the efforts of Robertson and chief veterinary officer, John Malcolm, to clean up Birmingham's milk supply.[82] Improvements were quickly made to the supply from within the city's boundaries but supplies coming from outside proved more difficult as neither Robertson nor Malcolm had any powers to inspect.[83]

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[77] J. Wacher, "'Lessening Our Greatest Scourge": Management of the Tuberculosis Milk Problem in Birmingham at the Turn of the Nineteenth Century: Midland History Prize Proxime Accessit 2006', *Midland History,* 33, 1 (2008), pp. 115-130, pp. 121-124; Mooney, *Intrusive Interventions*, pp. 159-162.
[78] For an overview of public health in the city during Robertson's era, see council histories, Vince, *History of the Corporation IV,* pp. 127-161; J. T. Jones, *History of the Corporation of Birmingham, Vol. V* (Birmingham, 1940), pp. 119-217.
[79] Robertson, *Special Report on Infant Mortality* (1904).
[80] Wacher, "Lessening our Greatest Scourge", p. 125.
[81] Vince, *History of the Corporation IV*, p. 147; Niemi, Public *Health and Municipal Policy*, p. 92.
[82] Niemi, *Public Health and Municipal Policy*, pp. 113-158; Wacher, "Lessening our Greatest Scourge".
[83] Vince, *History of the Corporation IV*, pp. 147-149.

Robertson's focus was not exclusively on the milk supply but also how to prevent the spread of pulmonary TB. The council supported Robertson's voluntary notification scheme for this disease, as instigated by him in Sheffield, even though nationwide compulsory notification of TB did not come into force until 1911. The council had a history of supporting medical interventions such as these, with the voluntary notification scheme for infectious disease in 1875 under Hill. [84] The council also authorised the testing of samples at the city's university bacteriology laboratory.[85] Robertson was resolute that this bacteriological disease could be prevented at a time when most of the profession was opposed to notification for TB.[86] The role of dried sputa in spreading TB was debated from the mid-1890s and notices warning against the habit of spitting were posted in streets and on trams. Eventually in 1911 it was made an offence to spit in public places in Birmingham.[87] In 1909 the first municipally owned and run sanatorium, Salterley Grange in Gloucestershire, was opened but as Niemi points out, it was not intended for those considered to be incurable.[88] Niemi suggests that Robertson was a keen advocate of this form of treatment at a time when the medical profession was divided on its effectiveness.[89] From the second decade of the twentieth century, after the expansion of Birmingham's boundaries and government grants, more sanatoria became operational and services expanded with dedicated TB visitors and a dispensary.[90] As Chapter Seven reveals, by 1913 Birmingham's Public Health Department was still heavily staffed for housing

[84] Mooney, *Intrusive Interventions*, p. 55.
[85] Vince, *History of the Corporation IV,* p. 132-133.
[86] Hardy, *Epidemic Streets*, p. 262.
[87] Vince, *History of the Corporation IV*, p. 133.
[88] Niemi, *Public Health and Municipal Policy*, p. 140.
[89] Niemi, *Public Health and Municipal Policy*, pp. 138-144.
[90] Niemi, *Public Health and Municipal Policy*, p. 143

inspection but Robertson had introduced greater segregation between *medical* and *sanitary* inspection due to his understanding of bacteriology and also because of the greater professionalisation of public health work. MOHs and assistant MOHs had qualifications in public health, directing them in 'medical, person-centred and disease-centred work' and leaving the 'broad sanitary agenda' to sanitary inspectors and engineers.[91]

Porter suggests that bacteriology was influential in persuading MOHs to believe that education was needed to prevent the spread of TB.[92] Hill had always linked cases of infectious disease to bad housing and the environment, emphasising the need for new healthy homes. Robertson too wanted new homes but also differentiated this from the supposed behaviour of the inhabitants as contributory to disease. In his first special report on the unhealthy conditions in the Floodgate Street area, Robertson not only commented on the area as 'typical poverty-stricken' and listed the 'insanitary' conditions, but also made more moral judgements on people's behaviours. He suggested that the 'ignorance and carelessness of the people' was 'catching' and that 'degenerates' could contaminate others who would otherwise lead 'clean and healthy lives'.[93] Niemi makes the point that the discovery of disease-causing microbes and the consequent shift towards improving the behaviour of the individual was useful for the council as it relegated the socio-political problem of housing to a secondary position.[94] Porter suggests that it was 'around 1907' that advocates of preventative

[91] Worboys, *Spreading Germs*, p. 239.
[92] Porter, 'Biologism, Environmentalism and Public Health', p. 170.
[93] Robertson, *Report 1904* which includes *MOH Report on Unhealthy Conditions in the Floodgate Street Area and the Municipal Wards of St. Mary, St. Stephen and St. Bartholomew* (Birmingham, 1904), pp. 9, 18.
[94] Porter, 'Biologism, Environmentalism and Public Health', p. 170; Niemi, *Public Health and Municipal Policy*, pp. 123-130. The 'housing question' occupied Birmingham council for many years and there was at times bitter division over policy. More details can be found in the council histories; 'The Improvement Scheme' in Bunce, *History of the Corporation II*, pp. 455-506; Vince, *History of the Corporation III*, pp. 340-363; *Vol IV*, pp. 181-204

medicine joined with town planners to call for housing reform. Robertson's interests in the relationship of slum housing and its effects on health and society intensified as the town planning movement grew and through his engagement with eugenic ideas.[95]

Robertson was a founding committee member of the Birmingham Heredity Society (BHS), formed in 1910 'for the study of heredity and its bearings on the human race'.[96] Four surviving annual reports contain membership lists and reveal that in its second year, the BHS became affiliated to the Eugenics Education Society (EES), later known simply as the Eugenics Society.[97] The BHS was formally launched at a meeting at the Council House and in its first year held a large public meeting at the Midland Institute on 1 March 1911 with between 900 and 1000 people present. In its first year it recorded 206 members which, as Patricia Garside points out, was not unique to Birmingham:

> By 1914, eugenics was seen as complementary to the traditional aims of better housing and sanitation through the shared objective of greater public well-being and efficiency. Its message was embraced across a wide social and political spectrum: its strongholds lay in certain aristocratic families, notably the Cecils, and in the middle

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and Jones, *History of the Corporation V*, pp. 302-315. At the time of writing, the author of this thesis is aware of doctoral research being undertaken into municipal housing in Birmingham by Robert Brown, PhD candidate, University of Birmingham.

[95] Porter, 'Biologism, Environmentalism and Public Health', p. 168; Porter, *Health, Civilization and the State*, p. 160. The same year that Robertson's tenure at Birmingham began saw the publication of the *Report of the Inter-departmental Committee on Physical Deterioration* (London, 1904), available online via the Wellcome Collection https://wellcomecollection.org/works/uy7sevtp [accessed 21 July 2022].

[96] Annual reports of Birmingham Heredity Society 1910/11; 1911/12; 1912/13; 1913/14.

[97] Birmingham was the largest branch; see Welshman, 'Eugenics and Public Health in Britain, 1900-40, pp. 56-75, p. 56. For more about eugenics see L. A. Farrell, *Origins and Growth of the English Eugenics Movement, 1865-1925* (London, 2019). This publication is a facsimile of the original typed thesis submitted to Indiana University, 1969; Porter, *Health, Civilization and the State*, pp. 165-195; Wellcome Library Digital Collections, G. Ferry, 'Genetics in Context', *Wellcome Library, Codebreakers: Makers of Modern Genetics* (2021) https://wellcomecollection.org/works/ba6786qg [accessed 14 January 2024]; P. Bowler, 'How the history of genetics charts the rise and fall of eugenics', [Blog] 1 August 2019, *The British Academy* (2022) https://www.thebritishacademy.ac.uk/blog/how-history-genetics-charts-rise-and-fall-eugenics/ [accessed 27 August 2022].

class, particularly the professional groups, voluntary organizations and women philanthropists.[98]

Dorothy Porter highlights disagreements between scholars over the reception of eugenics, with some hinting that it appealed more to middle-class professionals whereas others, such as Greta Jones, suggest greater engagement from the commercial and entrepreneurial middle classes.[99] The BHS committee and ordinary members included councillors from some of the leading families in the city, plus a mixture of medical professionals, academics and clergy, implying that in Birmingham the appeal was to both groups. Notable supporters included Neville and Norman Chamberlain, Dame Elizabeth Cadbury and Dr George A. Auden, Birmingham Schools Medical Officer, and from the university, Margery Fry and Dr Stanley Barnes.[100] The ordinary members list reveals that most lived in the Edgbaston and Moseley areas of the city where many of the middle to upper-middle classes lived. This seems to support Jones' argument and Hamlin's view of class divisions at play.[101] However, it cannot be known if all members were active adherents of this new thinking or had merely subscribed to join their peers. Comments in the 1911/12 report point to a poor response from members for requests to complete the 'Galton

[98] Garside, p, 29.
[99] Porter, 'Biologism, Environmentalism and Public Health', p. 163.
[100] All those mentioned except Elizabeth Cadbury were BHS committee members, Cadbury was an Ordinary Member; for more information on these individuals, see A. J. Crozier, 'Chamberlain, (Arthur) Neville (1869-1940)' , *ODNB*, https://doi.org/10.1093/ref:odnb/32347; Elizabeth was the wife of George Cadbury (1839-1922), see S. Delamont, 'Cadbury [née Taylor], Dame Elizabeth Mary (1858–1951)', *ODNB* https://doi.org/10.1093/ref:odnb/45784 ; T. L. Hodgkin, revised by M. Pottle, 'Fry, (Sara) Margery (1874-1958)', *ODNB*, https://doi.org/10.1093/ref:odnb/33286 [all accessed 24 August 2023];
See *Royal College of Physicians* (2019) for 'George Augustus Auden (1872 -1957)', available at https://history.rcplondon.ac.uk/inspiring-physicians/george-augustus-auden and Arthur Stanley Barnes (1875-1955) https://history.rcplondon.ac.uk/inspiring-physicians/arthur-stanley-barnes [accessed 27 July 2022]
[101] Hamlin, 'The History and Development of Public Health', p. 29.

Laboratory Schedule for the Hereditary Transmission of Disease and Temperament with the facts of their own or some other family'.[102] This suggests that the city's elite may have been interested in the idea but were happy for other classes to be the subject of investigation and not themselves.

Although Porter and Renwick agree on the limited influence of eugenics on British policy, Renwick acknowledges that eugenics was widely discussed in the two decades after the EES was formed in 1907. This is evident in Birmingham as between 1910 and 1914 a significant number of the civic elite and the two principal medical officers, for the city and schools, were engaging with eugenic literature and lectures.[103] In particular, eugenics was supported by members of the Education Department who looked after school medical services, special schools and policies for those categorised as 'feeble minded'.[104] In 1911 a Hygiene sub-committee was formed within the Education Committee, chaired by Elizabeth Cadbury.[105] As Niemi argues, Birmingham's policy to tackle infant mortality lay in education and the reinforcement of 'gender' roles, particularly the importance of the full-time mother.[106] Cadbury fits Garside's category of women philanthropists and she continues to be celebrated for her philanthropic work with women and children in Birmingham today.

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[102] Annual reports of Birmingham Heredity Society 1910/11; 1911/12; 1912/13; 1913/14.
[103] Annual reports of Birmingham Heredity Society 1912/13. Lectures given to members of the Society between 1912 and 1913 were: Inheritance of some Human Diseases and Abnormalities by Mr Leonard Doncaster; Economic Conditions and Eugenics by W. C. Marshall; The Negative Aspect of Eugenics by Sir James Barr; The Study of the Causes of Insanity by Dr Mott; Fertilisation by Professor Peter Thompson.
[104] See Welshman, 'Eugenics and Public Health in Britain'.
[105] BAC, BCC, BCC/1/BH/10/1, Hygiene Sub-Committee 1911-1949. For more about Dame Elizabeth Cadbury and her role as Chair of this committee, see chapter 4 in H. V. Smith, 'Elizabeth Taylor Cadbury (1858-1951): Religion, Maternalism and Social Reform in Birmingham**,** 1888-1914' (Unpublished PhD Thesis, University of Birmingham, 2012), pp. 166-227.
[106] Niemi, *Public Health and Municipal Policy*, pp. 90-92.

However, the influence of a pre-war interest in the science of eugenics or the wider social hygiene movement is missing from analysis of her importance.[107]

The BHS did not regroup after the First World War, suggesting that the council's association with eugenic ideas dissipated and supporting what Berridge describes as the 'lessening importance' of genetics and heredity.[108] However, through its affiliated status, former BHS members could continue a membership with the EES. Analysis of the member lists of the Eugenics Society, available from 1926, do not suggest a large Birmingham-based contingent.[109] However, a few individuals continued membership, including Robertson who was listed as Fellow in 1928 and again in 1931.[110] Obituaries for Robertson also reveal that he was, for a number of years, Chair of the Birmingham branch of the British Social Hygiene Council, which before 1925 was known as the National Council for Combating Venereal Diseases.[111] This places Robertson in his intellectual context as he moved increasingly towards an interest in housing and town planning, producing two books on housing, and being involved at a national level with town planning Acts.[112]

During Robertson's first decade as MOH the housing problem grew more acute as more houses became unfit and insufficient new houses were built, as highlighted by Robertson in his 1912 report.[113] Housing formed a key part of his annual reports between 1910 and 1914, influenced by the passing of the Housing and Town

[107] Garside, p. 28; Smith, 'Elizabeth Taylor Cadbury'.
[108] Berridge, *Public Health*, p. 63.
[109] Wellcome Library, SA/EUG/A73-81, Eugenics Society, List of Officers, Fellows and Members 1926-1977, available online at https://wellcomecollection.org/works/xumbfwu8 [accessed 21 Sept 2021].
[110] Eugenics Society, List of Officers, Fellows and Members, 1928, 1931, 1934.
[111] *Birmingham Post,* 18 December 1936 and *Birmingham Mail*, 17 December 1936.
[112] Sturdy, 'Robertson, Sir John'.
[113] Robertson, *Report 1912*.

Planning Act 1909, council debates and the enlargement of Birmingham's boundaries. The chair of the Housing Committee for Birmingham council between 1901 and 1911 was John Sutton Nettlefold who was against municipal housing.[114] In 1910 Robertson described how he had watched the progress of the 'town planning movement' with interest and offered his opinion to the Public Health and Housing Committee that more attention should be paid to housing in central areas rather than the suburbs where the artisan class 'can and do look after themselves'. He wanted attention devoted to the 'population amenable to betterment', who were living among those who Robertson considered were not; this echoed his views in 1904.[115] Robertson was able to offer his opinions publicly at the council's Special Housing Enquiry conducted between 1913 and 1916, and his assistant MOHs and the Superintendent of Health Visitors also submitted evidence.[116] As part of that enquiry, surveys were sent to various associations and the statement of one witness summed up why houses were not being built in central Birmingham. Mr S. Jacobs, Secretary of the Hebrew Board of Guardians stated:

> I cannot suggest any remedy in Birmingham without extra burden to charity or the rates. It is practically impossible to supply decent, cheap, sanitary central houses on a commercial basis at the present prices of labour, material and land value.[117]

[114] For more on John Nettlefold, see M. James, 'John Sutton Nettlefold, Liberalism and the Early Town Planning Movement', *Journal of Liberal History*, 75 (2012). For more and image, see 'Councillor J. S. Nettlefold JP', *Connecting Histories* (2015-2023) https://www.search.connectinghistories.org.uk/Details.aspx?&ResourceID=1418&PageIndex=1&KeyWord=nettlefold [accessed 27 August 2023]
[115] Robertson, *Report 1910.*
[116] Robertson, *Report 1914*.
[117] BAC, BCC, BCC/1/BR/1/1/1, Housing Enquiry Committee Book, 1913-1916, Witness No. 10 The Hebrew Board of Guardians: Representative Mr S Jacobs, Secretary of the Board.

Since Hill had voiced his concerns twenty years earlier about the problem of condemning houses with no new ones to replace them, the situation had only grown worse.

Garside points out that there was a shift after the First World War with 'an emphasis on heroes' and that a new definition of 'deserving and undeserving was being posed' as to who should be allocated council housing.[118] In *Housing and Public Health* (1919) Robertson stated that 'no single condition in the lives of the masses has such a damaging effect on health or does harm in so many other ways, as bad housing'.[119] He estimated that there was a shortage of 12,000 houses and almost nine percent of the houses in the city were empty, as they were classified as unfit for habitation. Additionally, he reported that 600 consumptive soldiers were visited and that '107 were living in houses with two families because when the soldier left for the war the family gave up their house and moved into cheaper lodgings'; upon their return there were 'no houses to be had'.[120] This illustrates what Garside calls the post-war 'housing famine'.[121] Throughout the second and third decades of the twentieth century, town planners, social hygienists and eugenicists debated whether the presence of slum housing or the people living in the slums made for unhealthy conditions.[122] Roberston was concerned for the poorest classes and the lack of decent affordable housing; he believed that poor housing was not only bad for health but also that it was part of a 'vicious circle of drink, vice, poverty, dirtiness and

[118] Garside, p. 31.
[119] Robertson, *Housing and Public Health*, preface.
[120] Robertson, *Housing and Public Health*, pp. 141, 143.
[121] Garside, p. 30.
[122] Garside, p. 25,

ignorance'.[123] He believed that the reason for so many 'army rejects', those not considered 'A1' for army recruitment, was because of the 'unwholesome conditions under which they had lived and worked'. He added that those from slums were 'unhealthy in mind as well as underdeveloped in body'.[124] Robertson appeared to have held some 'hereditarian' views but strongly advocated the 'environmental' argument against slums, and he repeated in 1931 that 'slums produce something more than bad health – they make bad citizens'. Robertson retired from public health administration in 1927 but continued with his professorship at the university and to publish in journals.[125]

Garside suggests that the overlapping of planning and eugenicist and social hygiene groups is 'a highly significant', yet 'neglected phenomenon'.[126] At the same time as being a founding committee member of the BHS, Neville Chamberlain was chair of the council's Town Planning Committee and both he and Robertson continued their interests and became involved in policy making at a national level.[127] Robertson was a member of the consultative committee for the new Ministry of Health and Town Planning, giving evidence to the Unhealthy Areas Committee 1919-1921. This committee was chaired by Neville Chamberlain, after he had entered national politics in 1918.[128] Legislation in 1919 and 1924 and government grants saw Birmingham council taking the lead in local authority house building. Chamberlain, when

[123] Robertson, *Housing and Public Health,* p. 6.
[124] Robertson, *Housing and Public Health*, pp. 17-18.
[125] Professor Sir John Robertson, 'The Slum Problem', *J.R.S.I.* (51) 1930-1, pp. 279-284, quoted in Garside, p. 35.
[126] Garside, p. 42.
[127] Crozier, 'Chamberlain (Arthur) Neville, 1869-1940'.
[128] S. Pepper and P. Richmond, 'Homes Unfit for Heroes: The Slum Problem in London and Neville Chamberlain's Unhealthy Areas Committee, 1919-21', *The Town Planning Review,* 80, 2 (2009), pp. 143–171.

Chancellor of the Exchequer, opened the 40,000th municipal house on the Weoley Castle Estate in Birmingham in 1933.[129]

The examination of Birmingham's first two MOHs has placed each within a context of changing medical knowledge, local government practice and a shift towards an increasingly interventionist approach to public health. The next section reassesses the impact of Birmingham's MOHs on infant mortality. It argues that previous assessments have ignored aspects of the social, political and cultural environment in which Hill and Robertson operated as the council pursued broader public health measures and policies; and equally have not considered medical knowledge and new understandings of how disease was spread.

Reassessment of MOH Impact on Infant Mortality

Galley and Procter assess the impact of interventions to tackle infant mortality and compare the roles of Hill and Robertson. They argue that the responsibility and resulting success or failure in tackling IMRs lay primarily with the MOH. Both historians conclude that Hill's record on infant mortality was poor whereas Robertson's record was more exemplary.[130] These judgements may have been influenced by contemporary commentaries, such as obituaries for Robertson, which make special mention of his schemes for TB and infant mortality,[131] and also because one of his first major reports in 1904 was about infant mortality in the city.[132]

[129] 'The Weoley Castle Estate, Birmingham: 'Everything that science and ingenuity can provide', *Municipal Dreams* [Blog] posted 4 November 2014 see https://municipaldreams.wordpress.com/ [accessed 14 January 2024].
[130] Galley, 'Social Intervention', p. 34; Procter, pp. 154, 156-157.
[131] 'Death of Sir J. Robertson', *Birmingham Daily Gazette*, 17 December 1936.
[132] Robertson, *Special Report on Infant Mortality 1904*.

However, Hill also produced reports on infant mortality, but the national focus on that issue did not gather strength until the first decade of the twentieth century.

The IMR for Birmingham remained high during Hill's era in comparison with the falling IMR during Robertson's, but this picture was consistent with the national trend.[133] Galley in particular is critical of Hill's record on IMRs and suggests that Hill 'effectively put the blame for high IMRs on the mothers themselves and he distanced himself from any responsibility'.[134] However, Galley then contradicts this in acknowledging that Hill, as early as 1877, had identified a suitable strategy to tackle the issue with his suggestions of establishing a visiting society of ladies to offer instruction and nurseries or creches for mothers who work.[135] Galley does not refer to the Ladies' Association for Useful Work who gave reports to the Health Committee and worked closely with Hill (Chapter Seven).[136] This is because the Ladies' Association reports can be found in the minute books of the Health Committee but not in the MOH annual report, highlighting the potential drawbacks of relying on a single source for research. As for laying the blame with mothers, Hill's reports suggest that he despaired at mothers who did not breastfeed and at the stubborn refusal by the poorly educated to take advice, but he was not alone among MOHs in holding those views.[137] As Procter points out, by the second decade of the twentieth century many MOHs 'concurred'

[133] According to Vince, *History of the Corporation IV*, pp. 145-146, the average IMR between 1886 and 1899 was 180, and between 1900 and 1913 the average was 158 (a reduction but still higher than the average for England and Wales). See Procter, 'Infant Mortality' for more about IMR for Birmingham and potential problems with the declared IMR rates and comparisons with other towns, pp. 45-49.
[134] Galley, 'Social Intervention', p. 31.
[135] Galley, 'Social Intervention', p. 31.
[136] This Ladies' Association is discussed in Chapter Seven. Also see Procter, pp. 74-92.
[137] Hill, *Report 1897*, p. 21; Galley, 'Social Intervention', p. 33.

with the opinion that 'maternal habits were more important than any other variable in the issue of infant mortality'.[138]

Galley concludes that Hill had a 'lack of will' to tackle the problem,[139] and Procter supports Galley's view that Hill distanced himself from responsibility.[140] Galley also suggests an underplaying of the issue in Hill's reports through the suggestion that 'an embarrassed Hill' made no mention of the IMR being at its highest in 1897 when an epidemic of diarrhoea afflicted the city. However, Hill discussed the high number of deaths of infants in his report but within a separate section dedicated to the epidemic.[141] This suggests that Galley's conclusions are based solely on IMRs and sections of MOH reports. Galley, in his 2006 study, fails to consider the city's sanitation, council policy or financial resources before and after the point he cites when IMRs start to fall across the city.[142] The broader context of what the council was spending on the purchase of the waterworks, and on infrastructure for sewage and waste management is important. Galley's Table 1 shows that the IMR starts to decline steadily from 1901 but particularly from 1905 which coincides with the change in MOH. However, the decline also coincides with the start of the Elan Valley supply which in turn facilitated a more determined policy for conversion from the privy pan to the water closet in the poorest parts of the city.[143] Galley highlights several important interventions for reducing infant mortality such as child visiting, cleaning up the milk supply and providing access to dried milk, which were implemented during

[138] Procter, p. 24.
[139] Galley, 'Social Intervention', p. 31.
[140] Procter, p. 157.
[141] Hill, *Report 1897*, pp. 20-25.
[142] Galley, 'Social Intervention', pp. 33-4.
[143] Galley, 'Table 1: Infant Mortality Rates in Birmingham, 1871-1910' in 'Social Intervention', p. 31.

Robertson's tenure. However, some of this was driven by national priorities and legislation. Galley has continued to explore infant mortality in England and, writing in 2023, he acknowledges the need for more in-depth local studies and refers to the importance of the work of Nigel Morgan in respect to his argument about the relationship between the horse population, flies and higher rates of enteric disease. Galley also points to the huge scope for future local research as more records from the twentieth century become accessible.[144]

As discussed in Chapter Seven and covered by Procter, the increase in the provision of mother and child welfare services took time, but the first female health visitors in the city were introduced during Hill's era.[145] Davies, in her study of Hemsworth in Yorkshire, makes particular reference to Birmingham, concluding that there was 'insufficient will to make available the necessary finances' to tackle the problem.[146] It is difficult to comment on 'will' but as Chapter Five has revealed, the scheme for water was well over budget by that point, restricting council financial resources. Alternatively, Procter suggests that Hill considered social problems to be beyond the remit of his department, and in one sense this was true since the role of the MOH at that time was to prevent the spread of disease in the community.[147] Many MOHs felt powerless to control or rectify social issues of poor education, poverty and bad housing.[148]

As the first MOH for Birmingham, Hill started from scratch on all aspects of public health. In line with the rest of the nation, the priority both nationally and locally during

[144] Galley, *Infant Mortality*, p. x and pp. 163, 272-274.
[145] See Chapter 7 and Procter, 'Infant Mortality'.
[146] Davies, p. 123.
[147] Procter, p. 83; Berridge, *Public Health*, p. 52.
[148] Galley, 'Social intervention', pp. 30-31.

the second half of the nineteenth century was sanitation, an objective that absorbed much local government resource through major and expensive improvement schemes. As has been demonstrated in this study, water supply, the sewage crisis and infectious disease occupied much of Hill's time. Although MOHs had some legislative powers to operate, they could not spend local authority funds at will: they were employed officers who reported and recommended actions, but it was a local authority decision to approve schemes and authorise expenditure.[149] Hence, it would be fairer to suggest that Hill's work fell in line with national and local priorities and available financial resources. However, the relevance of contemporary medical knowledge and practice should also be considered.

Chapter Six argues that the perfect environment for a plague of flies every summer was created by the city's municipal waste management; the prevalence of ashpit and pan privies; and the sheer number of horses and stables in the city. This supports other studies that highlight the meteorological impact of climate, the proximity of animals to living space and the influence of individual towns' waste management.[150] This is important in debates about the success of tackling the IMR in Birmingham and

[149] Procter acknowledges this to a greater extent than Galley.

[150] Williams and Mooney, pp. 185-212. This expanded and broadly agreed with a study by R. I. Woods, P. A. Watterson and J. H. Woodward, 'The causes of rapid infant mortality decline in England and Wales, 1861-1921. Parts I and II', in *Population Studies*, 42 (1988), pp. 343-366, and 43 (1989), pp. 113-132, which included Birmingham in its analysis. Other studies include: N. Rogers, 'Germs with Legs: Flies, Disease, and the New Public Health', *Bulletin of the History of Medicine,* 63, no. 4 (1989); A. Hardy, *The Epidemic Streets: Infectious Disease and the Rise of Preventative Medicine* (Oxford, 1993), pp. 184-186; N. Morgan, 'Infant Mortality, Flies and Horses in Later-Nineteenth-Century Towns: A Case Study of Preston', *Continuity and Change,* 17 (2002), pp. 97-132; C. French and J. Warren, 'Medical Officers of Health and Infant Mortality: The Case of Kingston-Upon-Thames in the Late Nineteenth and Early Twentieth Centuries', *Local Population Studies*, 73 (2004), pp. 61-72; C. French and J. Warren, 'Infant Mortality in the Canbury Area of Kingston Upon Thames, 1872–1911', *Continuity and Change,* 22, 2 (2007), pp. 253-78; P. Atkins, 'Animal Wastes and Nuisances in Nineteenth-Century London' in P. Atkins (ed.), *Animal Cities: Beastly Urban Histories* (Farnham, 2012), pp. 19-51, pp. 42-3; N. Davie, '"An Unbidden Guest at Your Table": Purity, Danger and the House-Fly in the Middle-Class Home, c. 1870-1910,' *Cahiers Victoriens & Edouardiens*, 85 (2017), unpaginated, available at https://doi.org/10.4000/cve.3151A. Webb Jr, *The Guts of the Matter: A Global History of Human Waste and Infectious Intestinal Disease* (Cambridge, 2020), pp. 75-76.

explains why IMRs remained so high during Hill's tenure. It was well known that hot, dry summers affected water supply and impacted upon IMRs. Hill in 1902 was pleased to report a reduction in the number of infant deaths from diarrhoea but acknowledged that the IMR was much lower due to a cool summer.[151] Warm weather quickly spoiled food and milk without refrigeration and all MOHs despaired of filthy feeding tubes; however, Danika Bonham also makes the point about mothers feeding babies with condensed milk, which is sweetened and attractive to flies.[152] In Hill's annual reports there was a notable absence of any reference to the nuisance of flies, this was also observed by French and Warren in their analysis of the MOH reports for Kingston upon Thames.[153] The appreciation of the fly as a vector of disease was not common medical knowledge until the early decades of the twentieth century.[154] Hence, Hill was operating in an intellectual climate where flies were not recognised as a vector; this explains why he did not consider this annual plague worthy of mention in his reports. In the last quarter of the nineteenth century public health advice on the dangers of flies was simply not available.

In his 1904 special report on infant mortality, occasioned by the rise in death rates that year,[155] Robertson concluded that general sanitary work had done little to reduce infant deaths and instead suggested that local feeding customs, passed from mother

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[151] Hill, *Report 1902*, pp. 26-27.
[152] Bonham, 'From the Mouths of Babes', pp. 24, 43.
[153] French and Warren, 'Infant Mortality in the Canbury Area', p. 272.
[154] N. Rogers, 'Germs with Legs: Flies, Disease, and the New Public Health', *Bulletin of the History of Medicine,* 63, 4 (1989), pp. 599-617; Morgan, 'Infant Mortality, Flies and Horses in Later-Nineteenth-Century Towns', pp. 97-132; Atkins, 'Animal Wastes and Nuisances in Nineteenth-Century London', pp. 19-51, pp. 42-3; A. Hardy, *Salmonella Infection, Networks of Knowledge and Public Health in Britain, 1880-1975* (Oxford University Press, 2015), pp. 68-69; N. Davie, '"An Unbidden Guest at Your Table": Purity, Danger and the House-Fly in the Middle-Class Home, c. 1870-1910,' *Cahiers Victoriens & Edouardiens*, 85 (2017), unpaginated, available at https://doi.org/10.4000/cve.3151 [accessed 19 July 2022]; Webb Jr, *The Guts of the Matter,* pp. 75-76.
[155] The number of infant deaths reported in the MoH Annual Report for 1904 was 1,139 in comparison with 731 in 1903, pp. 15-16.

to daughter, were the major cause; Hill had also commented on this aspect back in 1877.[156] Robertson, like Hill before him, described the unclean conditions within courtyards, with health visitors often reporting that these areas needed urgent attention. Robertson blamed the tenants, citing 'everybody's duty is nobody's', and consequently the courtyards were only ever cleansed by the rain in between visits from the council court cleansers which started in 1899.[157] He too made no mention of flies. Robertson recommended that personal cleanliness, education of females in laws of health, and a clean milk supply were essential to reduce infant mortality, adding that reducing drunkenness would mitigate poverty.[158] These were common suggestions voiced by many MOHs around the country and beyond. Interestingly, a study examining twenty-six cities in the USA between 1910 and 1930 found little evidence to support the view that municipal interventions, such as purifying water and milk supplies, contributed to the reduction in summer diarrhoea.[159]

During the first two decades of the twentieth century, public information literature in Europe and the USA transformed the fly from a summer pest to 'germs with legs', a dangerous bringer of disease to the home and killer of babies.[160] By 1915 handbills on 'Protecting Babies during Hot Weather' and 'Prevention of Flies' were distributed to all houses in the poorest areas in Birmingham.[161] Although not a Birmingham example (none appears to have survived in the archives), Figure 8.4 shows a 1927 example of a public health poster declaring that the fly is 'man's greatest enemy'. The

[156] Hill, *Report 1877*; Galley, 'Social Intervention', p. 131.
[157] Robertson, *Special Report on Infant Mortality 1904.*
[158] *Ibid*.
[159] D. M. Anderson, D. I. Rees, and T. Wang, 'The Phenomenon of Summer Diarrhoea and Its Waning, 1910-1930', *Explorations in Economic History,* 78 (2020).
[160] Rogers, p. 601.
[161] Low, 'Infant Mortality' in *Born in Birmingham*, p. 9.

key advice was to cover food, especially milk, keep rubbish under lids, and crucially to catch and exterminate flies and protect babies and young children.[162]

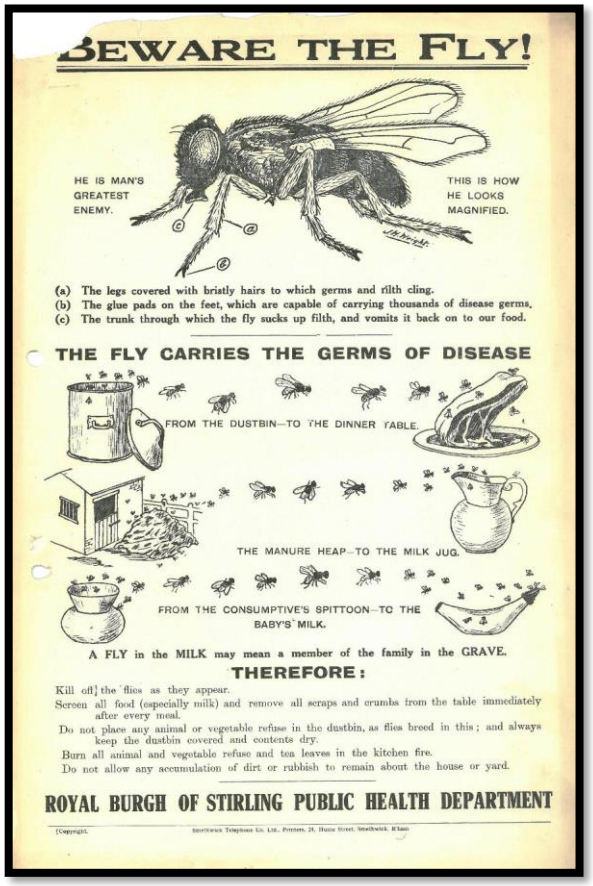


Figure 8.4: Beware the Fly! Public Health Information Poster, Stirling Burgh, 1927.

Image and permission to reproduce Stirling Council Archives, Stirling Burgh Collection.

It was well over a decade after Hill's retirement before Robertson confidently referred to flies as a danger to health in *Housing and Public Health*:

> We now know the part played by accumulations of refuse in causing disease on the one hand allowing flies to breed and transfer filth from the ashplace to food, and on the other hand, by such filth, when dry, being carried as dust into the dwelling. Nothing is more instructive than to watch the way in which flies pass from their

[162] Anne Hardy charts the development of medical entomology *in Salmonella Infection,* pp. 68-69.

> breeding places in filth to food inside the houses. If flies are caught, let us say in a stable manure pit and dusted with flour, it is possible to trace them into neighbouring houses at regular intervals during the day.[163]

Hence, when making comparisons between Hill's and Robertson's record in respect to IMRs, this fuller context is important. Robertson and his public health officials were armed with a new understanding of how disease was spread. Robertson's tenure also spanned a period which saw the rapid expansion of child welfare services which educated mothers in new hygiene practices.[164] In Britain, the battle with the common house fly became the focus of a national campaign to prevent and reduce infant deaths, promoted in the new Infant Welfare Centres and in initiatives such as National Baby Week, which began in 1917.[165] An important element in that battle with the fly, however, was better sanitation with the transition from pan privies to water closets made possible after the Elan Valley Scheme between 1905 and1915. The eventual reduction in infant mortality was due to many variables – sanitation, inspection, welfare and education on infant feeding, and cleaning and management of milk supplies.[166] Much of this materialised after Hill's retirement with the advent of new knowledge and changing national priorities when the expansion of public health services was made possible with state support.[167] Furthermore, the significance of horse manure and waste management practices, as detailed in this study, and their connection to flies and their contamination of milk and food, has been

[163] Robertson, *Housing and Public Health*, p. 57.
[164] Galley and Procter both correctly concluded that health visiting did little to influence IMRs in the first decades of the twentieth century until the service was considerably expanded.
[165] FoBAH, *Born in Birmingham*, p. 18.
[166] Berridge, *Public Health*, p. 59.
[167] Berridge, *Public Health*, pp. 61-65.

underappreciated as a major factor contributing to Birmingham's persistently high IMR at the end of the nineteenth century.

Conclusions

Critical assessment of Birmingham's first two MOHs has revealed changes in the thinking that underpinned the practice of public health. Hill and Robertson together span the shift away from the purely sanitarian and environmental model to a focus on the education of the population and the individual, particularly the mother, to pursue 'healthier' habits.[168] Hill's long career with Birmingham council as Analyst and MOH saw changing theories of disease and medical practice but overall, his entire career was defined by the city's environmental and sanitation problems. Hill is offered as an exemplar of what Barnes has termed the SBS – practising preventative medicine with the bringing together of old and new aetiologies to explain the causes of disease.[169] Equally, Hill's tenure supports Worboys' view of a gradual transition rather than an abrupt revolution triggered by the rise of bacteriology, because in everyday practice there was much more sanitary work to do.[170] Robertson inherited and continued with environmental and sanitary work but equally was an exemplar of the modern public health administrator, driven by the possibilities of the new field of bacteriology but also by the need to educate behaviour.[171] His tenure was defined by the national campaigns to reduce infant mortality and the prevention and treatment of TB. Other MOHs, most notably James Niven, MoH for Oldham, and Arthur Ransome, MoH for Manchester, are often credited as pioneers when the focus of the public health

[168] Niemi, 'Public Health Discourses', p. 129; Berridge, *Public Health*, p. 59.
[169] Barnes, *Great Stink of Paris*, p. 134-135.
[170] Worboys, *Spreading Germs,* p. 25.
[171] Hardy, *Epidemic Streets*, p. 255; Porter, 'Biologism, Environmentalism and Public Health', p. 170.

movement was at its height with a concern for TB.[172] However, following Mooney and Wacher, greater recognition should also be accorded to Robertson's work at Sheffield as one of the first places to introduce voluntary and then compulsory notification for TB, and for his work on cleaning up milk supplies in co-operation with veterinary colleagues in both Sheffield and Birmingham.[173] Examination of Robertson's interests and involvement with local societies revealed the influence of eugenics and social hygiene and how this interplayed with the city's acute housing crisis, to shape Robertson's views on the link between housing and social behaviour and his eventual support for 'environmental reform'.[174] Equally, the chapter has highlighted the level of engagement with eugenic thinking by those in positions of civic authority or influence in the first decades of the twentieth century through the forming of their own society. This in turn influenced municipal policy as council members applied this thinking to health and society, housing reform and town planning.[175]

Judgements about effective interventions to tackle infant mortality in the city have been reassessed within the context of medical knowledge at the time, council priorities on sanitation and waste management, and the national drive for mother and child welfare. It is argued that single public health issues within a locality should not be examined in isolation. A fuller contextual understanding of local specific conditions and medical knowledge and practice should be considered in any analysis.

Council policy was influenced by a mixture of priorities and by the economic situation at the time. Overall, councillors appeared willing to support the *medical*

[172] Hardy, *Epidemic Streets*, pp. 254-259.
[173] Wacher, "'Lessening Our Greatest Scourge", pp. 121-124; Mooney, *Intrusive Interventions*, pp. 159-162.
[174] Garside, p. 42.
[175] Berridge, *Public Health*, pp. 58-59.

recommendations of the MOHs for disease notification, isolation hospitals and sanatoria and laboratory testing. Targeted strategies for the physical environment and education, such as court cleansing and female health visitors, were supported but only in a limited way at first, suggesting that the MOHs often had to prove the benefits of their schemes to councillors before they agreed to increased expenditure.[176] Some schemes, such as the milk depot, were not supported, partly because of cost but also due to attitudes in the council towards mothers working and infant feeding.[177] This corroborates Michael Brown and Catherine Kelly's view of the 'complex negotiation of sanitary practice' and that medical practitioners were often not 'the principal drivers of public health'.[178] In matters of *non-medical* policy, such as waste management and conversion to WCs, the MOH had little influence. As this thesis shows, multiple factors were at play that were beyond the control of a medical practitioner. Similarly, the complex socio-political issue of housing for the working classes was too great for MOHs to have any impact locally.[179] Robertson realised that it would take state intervention to improve housing and he could only keep arguing the case on advisory committees until local and national policy changed significantly in the inter-war years.

[176] Niemi, *Public Health and Municipal Policy,* p. 182.
[177] *Ibid*., p. 92.
[178] Brown and Kelly, 'Authority', p. 210.
[179] F. Huw, 'Understanding Medical Officers of Health', *Public Health*, 102 (1988), pp. 545-553, p. 552.

Chapter Nine

Conclusion

This thesis explores the municipal responses to poor sanitation and river pollution in Birmingham between the 1840s and 1920s. It is a history of the urban environment that overlaps with the social history of medicine.[1] Equally, it is a contextualised history of sanitation in Birmingham which offers the first thorough academic analysis of municipal policy towards public health during that period. It sets out to examine the effectiveness of those responses for the health of the city, challenges some previous assessments by historians, and addresses gaps in histories of the city. It is what Shane Ewen terms a 'place-in-context' study but by extension it brings insights into the history of public health and British urban and social history, through its examination of local urban government, society, housing and lived experience.[2]

As a study of sanitation it contributes to urban environmental history and advances understanding of river pollution in the nineteenth century.[3] It adds new knowledge to the development of the water industry in England and Wales and shows how this influenced the development of municipal waste management systems.[4] It also

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[1] A. Wohl, *Endangered Lives: Public Health in Victorian Britain* (London, 1983); B. Luckin, *Death and Survival in Urban Britain: Disease, Pollution and Environment, 1800-1950* (London, 2015); T. Crook, *Governing Systems: Modernity and The Making of Public Health in England, 1830-1910* (California, 2016).
[2] S. Ewen, *What is Urban History?* (Cambridge, 2016), p. 23.
[3] L. Rosenthal, *The River Pollution Dilemma in Victorian England: Nuisance Law Versus Economic Efficiency* (London, 2014).
[4] J. A. Hassan, 'The Growth and Impact of the British Water Industry in the Nineteenth Century', *The Economic History Review* 33, 4 (1985), pp. 531-547; A. Hardy, 'Parish Pump to Private Pipes: London's Water Supply in the Nineteenth Century', *Medical History*, Supplement No. 11 (1991), pp. 76-93; B. Millward, 'Emergence of Gas and Water Monopolies in Nineteenth-Century Britain: Contested Markets and Public Control' in J. Foreman-Peck (ed.), *New Perspectives on the Late Victorian Economy: Essays in Quantitative Economic History, 1860–1914* (Cambridge, 1991), pp. 96-124; H. Barty-King, *Water, The Book: An Illustrated History of Water Supply and Wastewater in the United Kingdom* (London, 1992); S. Sheard, 'Water and Health: The Formation and Exploitation of the Relationship in Liverpool, 1847-1900', *Transactions of the Historic Society of Lancashire and*

illuminates the changing environment and lived experience of the inhabitants of Birmingham's back to backs.[5] As public health legislation placed greater responsibility for improvement on local authorities, this study examines the responses in Birmingham, the influences on municipal policy, and the impact of local government policy. It considers not only the councillors who administered but also the employees who worked in public health departments. Birmingham's first two Medical Officers of Heath (MOHs), the city's civil engineers and sanitary workers were crucial players and this thesis considers the importance of these key individuals. They are analysed in terms of their careers and the influence of social class and gender, medical knowledge, ideologies and evolving scientific advancements. The thesis also explores how the municipal responses were received by Birmingham's citizens and the nature of resistance to improvements. Significantly, this history allows for a reassessment of contemporary views about the city, its governance and the reputation of one of the city's key political figures, Joseph Chamberlain.[6] It offers

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Cheshire, 143 (1993), pp. 141-163; J. A. Hassan, 'The Water Industry 1900–51: A Failure of Public Policy?' in R. Millward and J. Singleton (eds), *The Political Economy of Nationalisation in Britain 1920-1950* (Cambridge, 1995), pp. 189-211, pp. 191-192; J. Hassan, *A History of Water in Modern England and Wales* (Manchester and New York, 1998); J. Brioche, 'Water and the Modern British City: The Case of London, 1835-1903' (Unpublished PhD Thesis, Stanford University, 2005); D. Spar and K. Bebenek, 'To the Tap: Public Versus Private Water Provision at the Turn of the Twentieth Century', *Business History Review*, 83, 4 (2009), pp. 675-702; L. Tomory, 'The Question of Water Quality and London's New River in the Eighteen Century', *Social History of Medicine,* 27, 3 (2014), pp. 488-507; G. O'Hara, *The Politics of Water in Post-War Britain* (London, 2017); L. Tomory, *The History of the London Water Industry, 1580-1820* (Baltimore, 2017); D. Lewis Brown, *The Elan Valley Clearance* (Eardisley, 2019); N. Higham, *The Mercenary River: Private Greed and Public Good, A History of London's Water* (London, 2022).

[5] C. Upton, *Living Back-to-Back* (Chichester, 2005).

[6] See the chapter 'Birmingham: The Making of a Civic Gospel' in A. Briggs, *Victorian Cities* (Middlesex, 1968), pp. 184-240; E. P. Hennock, 'Part II: The Municipal Gospel' in Book 1 Birmingham, *Fit and Proper Persons: Ideal and Reality in Nineteenth-Century Urban Government* (London, 1973), pp. 61-176; D. Fraser, 'Joseph Chamberlain and the Municipal Ideal', *History Today*, 37, 4 (1987); T Hunt, 'Joseph Chamberlain and the Municipal Gospel' in *Building Jerusalem: The Rise and Fall of the Victorian City* (London, 2004), pp. 313 – 380; J. P. Gherke, 'A Radical Endeavour: Joseph Chamberlain and the Emergence of Municipal Socialism in Birmingham', *The American Journal of Economics and Sociology*, 75 (2016), pp. 23-57;); R. Vinen, 'Chamberlain's Birmingham, in *Second City: Birmingham and the Forging of Modern Britain* (London, 2022), pp. 69-110.

other interpretations that challenge long-held views which have become embedded in the city's memory of this period.

These conclusions draw out the main findings from Chapters Two to Eight, before providing answers to the main research questions. Suggestions are then offered for future research and final comments.

Chapter Findings

Chapter Two addresses the absence of historiography on public health in Birmingham between 1842 and 1872. At a time of rapid urbanisation and industrialisation, it explores common urban problems, analysing housing, waste management and water supply; it places Birmingham in context in terms of sanitation.[7] It reveals the impact of Birmingham on the natural environment and how nature impacted the city.[8] A key research question was to ascertain conditions and look for motivating factors for change. The findings reveal poor sanitation throughout the city, with little systematised waste management and great inequalities between the social classes in terms of their access to and the quality of the water supply. The conditions in Birmingham's courts of back-to-back housing were particularly poor with overflowing ashpits and polluted wells. Environmentally, the council was legally challenged for its 'sewage nuisance' and pollution of the River Tame after the

[7] Ewen, *Urban History,* p. 23.
[8] Ewen, *Urban History*, pp. 79-80.

construction of two new sewer mains in the early 1850s resulted in direct discharges into the river, a problem that reached crisis point by 1871.[9]

Moving beyond the local, the chapter assesses the importance of external motivating factors and whether the Public Health Acts of 1872 and 1875 were the major influences for change. In fact, public health legislation was not the main initial motivation; instead, a succession of influential events much earlier in 1868 proved to be important. A long hot summer with drought conditions, a dispute with the privately-owned Birmingham Waterworks Company, and the hosting of the Social Science Congress brought the problems of poor sanitation and public health to greater civic and political attention. Birmingham is an excellent example of the impact of the public health reform movement, given the 'special attention' paid to host towns at congresses.[10] This chapter argues that 1868-69 provided the turning point in Birmingham's sanitation history, not merely because of the events of that year, but also because two key individuals were galvanised to shape the city's sanitation story for the next twenty-five to thirty years. Birmingham's Analyst, Dr Alfred Hill, was motivated to begin his campaigns for the closure of polluted wells; and Thomas Avery (councillor, alderman and mayor) was inspired to call for public ownership of the waterworks and lead the response to the city's sewage crisis, another primary influence on change before the passing of public health legislation of the 1870s.[11]

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[9] Birmingham Archives and Collections, Library of Birmingham (BAC), L.45.4.2107, *Report of the Sewage Inquiry Committee* (Birmingham, 1871); Rosenthal, *River Pollution Dilemma*, chapter 5.
[10] The National Association for the Promotion of Social Sciences, more commonly known as the Social Science Association. R. K. Huch, 'The National Association for the Promotion of Social Science: Its Contribution to Victorian Health Reform, 1857-1886', *Albion*, 17, 3 (1985), pp. 279-299, p. 279.
[11] BAC Lp45.32/233600, A. Hill, *What is the relation of water supply in large towns to the health of the inhabitants?* (Birmingham, 1868); BAC L43.3/31078, T. Avery, *The Corporation of Birmingham and the Water Supply of the Town: A Statement Addressed to Members of the Town Council* (Birmingham, 1869).

This turning point was separate from the political changes taking place with the rise of the Birmingham Liberal Association, and Chapter Three explores this aspect of local politics.[12] It sets out to answer why municipal socialism and sanitation came to be so strongly associated with an image of Birmingham, its governance and its leading politician, Joseph Chamberlain, and considers whether this view is justified. This question is discussed more fully later in overall conclusions.[13] Further, it explores urban culture and tests the validity of the label a 'Liberal golden age' in the town, culminating ultimately in the much-repeated accolade that Birmingham was the 'best-governed city in the world'.[14] To answer these questions, the following avenues are examined: the influence of the civic gospel and liberalism; the rise of Joseph Chamberlain in local government; and motivating factors for municipalisation. Others have highlighted that Chamberlain was not a pioneer of gas and water municipalisation,[15] but this chapter goes further by making a stronger argument for the contemporary building of a 'sanitary' narrative around Chamberlain, which was reinforced by his key speeches, pro-Chamberlain newspapers, monuments and council histories written by Chamberlain's admirers. Chamberlain's mayoralty coincided with the national passing of Public Health Acts, which provided the fortuitous opportunity for Chamberlain to appear as the local government leader on sanitation and public health. Derek Fraser suggests that the simultaneous attainment

[12] R. Ward, 'Birmingham: A Political Profile, 1700-1940' in C. Chinn and M. Dick (eds), *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 159-191, pp. 171-4.
[13] Vinen, *Second City,* p. 96.
[14] J. Ralph, 'The Best-Governed City in the World', *Harper's Magazine*, 81, 481 (1890); Ward, 'Birmingham: A Political Profile', pp. 171-174; Ewen, *Urban History*, pp. 92-113.
[15] 'Birmingham: The Making of a Civic Gospel' in Briggs, *Victorian Cities*, pp. 184-240; Hennock, 'Part II: The Municipal Gospel', *Fit and Proper Persons,* pp. 61-176; Hunt, 'Joseph Chamberlain and the Municipal Gospel', in *Building Jerusalem,* pp. 313 – 380; Gherke, 'A Radical Endeavour'; Vinen, 'Chamberlain's Birmingham, in *Second City,* pp. 69-110.

of the Gas and Water Acts assisted the view that there was a coherent social policy in Birmingham.[16] The findings of this study highlight that this was not the original intention, as the Gas Act was hindered by resistance, but the passing of these two Acts seemed to support this view. This chapter also evaluates the manifestation of civic pride through its buildings and monuments, some promoting public health provision, during the so-called Golden Age. It identifies a change in council priorities, because of a disastrous fire that struck right at the heart of the institutional symbol of the civic gospel. The burning down of the Central Library in 1879 motivated a shift in prioritising water supply for firefighting – a purpose that ran counter to the original reasons for the compulsory purchase of the waterworks for reasons of public health. This shift delayed the planned construction of a new reservoir and essential connections to the system over a three-year period. The chapter concludes that Ralph's accolade was given out of his admiration for businessmen councillors, such as Chamberlain, who adopted business principles in municipal affairs; in reality, however, Ralph had little knowledge of the true situation in the city.[17] The image of a Golden Age existed in the hearts and minds of the middle-class civic gospel-inspired councillors, but was not necessarily mirrored in the majority of the working classes who continued to live with difficult sanitary conditions.[18]

The next three chapters look beyond the Chamberlain mayoralty and examine more closely the municipal responses to environmental and sanitation problems and the impact of those responses. Chapter Four illustrates how effectively an urban local authority tackled the 'sewage question' and responded to environmental pollution

[16] Fraser, 'Joseph Chamberlain and the Municipal Ideal'
[17] Ralph, 'The Best-Governed City in the World'.
[18] Ward, 'Birmingham: A Political Profile', pp. 171-174.

through the development of waste management systems.[19] Birmingham had reached a point of crisis by 1870 when two legal cases were directed against the council for sewage nuisance of the land and pollution of the River Tame.[20] The findings of this chapter build upon the work of Leslie Rosenthal, revealing the dilemmas facing local authorities because of legal cases for sewage nuisance and river pollution.[21] Rosenthal highlights the longevity of the dispute with Charles Adderley, later Lord Norton, but in combination with Chapters Five and Six, the greater impact of this dispute is highlighted as it continued to influence council decisions on dry and wet waste management systems and domestic sanitation until the beginning of the twentieth century. Using Birmingham as a case study, the responses to the sewage crisis are examined: additionally, this thesis looks at the relevance of applying John Sheail's four-stage model for sustainability to the local experience. Sheail assesses the relationship between town and country and the concept of sustainability in terms of the management of urban wastes and rural or agricultural use. The first stage involved the channelling of 'filth' into sewers, polluting rivers and streams and prompting study of the potential of the land to 'cleanse the effluents'. The second stage was to adapt to an alternative 'dry' disposal system that could also be utilised in some form on the land. The third stage envisaged the development of sewage farming as a specific method of treatment to process waste. The fourth stage was

[19] [19] For more on the 'sewage question', see T. Crook, *Governing Systems: Modernity and the Making of Public Health in England, 1830-1910* (California, 2016), pp. 169-76; and for waste management, see pp. 289, 291-2; L. Rosenthal, *River Pollution Dilemma*.

[20] L. Rosenthal, 'Economic Efficiency, Nuisance and Sewage: New Lessons from Attorney- General v. Council of the Borough of Birmingham, 1858-95', *Journal of Legal Studies*, 36 (2007), pp. 27-62; Rosenthal, *River Pollution Dilemma*, pp. 57-90.

[21] Rosenthal, *River Pollution Dilemma*, pp. 57-90.

characterised by land-space capacity for processing being 'outstripped'.[22] These four stages are present, although some stages happened later than Sheail suggests and two ran concurrently.[23] The stages as manifested in Birmingham reveal the development of interconnected organised disposal for both wet and dry systems that incorporated new technology and actively sought to be sustainable and recycle as much as possible; this also extended to energy. It is concluded that Birmingham council developed an effective system to deal with disposal of waste. The findings provide parallels between the nineteenth-century sewage question and present-day debates surrounding the water industry, sustainability and recycling schemes.[24]

A significant response in 1877 was the formation of the Birmingham Tame and Rea District Drainage Board (BTRDDB), an organisation that has previously been little explored. Despite Rosenthal's extensive examination of Birmingham's sewage crisis, he did not devote detailed attention to the BTRDDB, as it was beyond the scope of his legal study. However, the formation of this early drainage board is important and contributes new knowledge about the beginnings of the water industry in England and Wales, illustrating especially how local authorities dealt with river pollution.[25] The findings show the interconnection of water supply and waste management once the water supply was municipalised, despite the administrative separation of these two facets. One motivation for the establishment of the board was to control what was being discharged into rivers by other local authorities, so as not to encourage

[22] J. Sheail, 'Town Wastes, Agricultural Sustainability and Victorian Sewage', *Urban History,* 23, 2 (1996), pp. 189-210, pp. 208-9.
[23] *Ibid.*
[24] H. Irving, 'The War on Waste: Using Urban History to Inspire Behavioural Change', *Urban History,* 48 (2021), pp. 307-319.
[25] Wohl, *Endangered Lives*, pp. 233-256; Hassan, 'The Growth and Impact of the British Water Industry', pp. 531-547.

additional litigation that would complicate Birmingham's ability to deal with river pollution. This meant bringing smaller local authorities' waste management under the board's control and is suggested as a major explanation for the boundary extensions that saw these smaller authorities absorbed into Birmingham from the 1890s.[26] Examination of BTRDDB rediscovers the important contribution of individuals, such as Avery and William Harris, who took ownership of the issue on behalf of the council for over thirty years, and the pioneering civil engineering of John Duncan Watson who designed the country's first large-scale percolating plant in the Tame Valley between Saltley and Minworth from 1903 to 1910.[27]

Chapter Five is dedicated to water supply: it fills a gap in the historiography of Birmingham and adds to knowledge about the beginnings of the water industry in England and Wales. It seeks to assess how effectively the council addressed the issues of quality and quantity once the city's only waterworks was municipalised.[28] To answer this question, the previously little-explored period between municipalisation in 1876 and the start of a new supply from mid-Wales in 1904 is closely examined. The findings show that the council actively worked to address both quality and quantity issues, but their efforts were consistently challenged due to weather extremes and the reliance on local sources of supply within the industrial basin. Equally, waste from the mains supply was a particular problem due to faulty pipework. The theme of resistance to policies continues to be explored and the thesis asks whether the public

[26] J. S. Nettlefold, 'Birmingham: City Extension and Town Planning', *The Town Planning Review*, Vol. 2, 2 (1911), pp. 99-112.
[27] For details of Watson's work at BTRDDB, see J. D. Watson, *The Works of the Birmingham Tame & Rea District Drainage Board* (Birmingham, 1912) and A. E. Harris, *History of the Birmingham Tame and Rea District Drainage Board* (Birmingham, 1927).
[28] Hardy, 'Parish Pump to Private Pipes'; Luckin, *Death and Survival,* p. 106.

ownership of the water supply made a difference. Ratepayer resistance challenged the water rating system and how it was calculated.[29] These findings expand upon the work of Vanessa Taylor and Frank Trentmann on 'ratepayer politics' by considering the relevance of the Archibald Dobbs' legal case against London's private Grand Junction Waterworks Company in 1881. This case was important for landlords of rental properties as it clarified whether water rate assessment should be on 'net' or 'gross' annual property value.[30] A similar action taken against Birmingham council appears to pre-date this, suggesting co-ordinated national action, but the Birmingham case ultimately had to wait for the outcome of the higher-profile Dobbs case before it was resolved in 1883.[31]

Chapter Five also examines the motivations and preparations for the major civil engineering scheme for a new supply from the Elan Valley in Wales. It analyses the little-explored economic aspects of sanitary investment and uncovered a more complex package of financial measures to generate the necessary funds. This included not only borrowing money through a local Act of Parliament but also water rate increases based on engineer revenue forecasts and predicted savings in operational costs through gravitational infrastructure design.[32] However, there was considerable overspend for the first stage: this necessitated a reappraisal of finances and forced the council to break its original promises to ratepayers and customers. This led to higher local rates, including further water rate increases for customers

[29] V. Taylor and F. Trentmann, 'Liquid Politics: Water and the Politics of Everyday Life in the Modern City', *Past and Present*, 211 (2011), pp. 210-41, p. 201.
[30] Taylor and Trentmann, 'Liquid Politics'; Higham, *The Mercenary River,* pp. 310-311.
[31] J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885), p. 432; Taylor and Trentmann, 'Liquid Politics', p. 206; Higham, *The Mercenary River,* pp. 310-311.
[32] T. Barclay, *The Future Water Supply of Birmingham* (Birmingham, 1898); A. McTominey, "Waterworks, Municipal Government and the Environment in Twentieth-Century Britain', *Urban History, First View* (2023), pp. 1-16, p. 14.

after 1915. Despite this, the project was successfully completed for the benefit of future generations.[33] These findings highlight the difficulty in using broad datasets, such as the total value of loans for sanitary investment, in any attempt to establish links with mortality decline. The experience in Birmingham demonstrates that drawing on statistical data sets alone cannot paint a full picture for a locality.[34] A further aspect involves the transition from private to public ownership and considers how important public ownership was for sanitary investment. It was crucial in enabling access to more favourable terms for borrowing and the burden was shared across a larger pool of ratepayers and water customers.[35] Parallels can be drawn between nineteenth-century and present-day debates around the ownership of water companies in England and Wales and how investment should be funded.[36]

Birmingham's courts of back-to-back housing notoriously had the poorest sanitation in the city, and Chapter Six analyses how the municipal responses to the environmental and sanitation problems impacted those inhabitants. It sheds new light on living conditions in courtyards and offers a different perspective from what traditionally had been a Whiggish progressive history.[37] The chapter sets out to assess whether the chosen responses by the council had any positive effect on the

[33] W. Bradford, J. Bridgeman, and M. Gaterell, 'A Review of the 1892 Water Demand Forecast for Birmingham', *Proceedings of the Institution of Civil Engineers. Engineering History and Heritage,* 163, no. 1 (2010), pp. 39-49. https://doi.org/10.1680/ehah.2010.163.1.39 [accessed 31 May 2023].
[34] B. Harris and A. Hinde, 'Sanitary Investment and the Decline of Urban Mortality in England and Wales, 1817–1914', *The History of the Family,* 24, 2 (2019), pp. 339-376; T. S. Aidt, R. J. Davenport and F. Gray, 'New Perspectives on the Contribution of Sanitary Investments to Mortality Decline in English Cities, 1845–1909', *The Economic History Review,* 76, 2 (2023), pp. 624-660, p. 657.
[35] Hassan, *A History of Water*, p. 19; Harris and Hinde, 'Sanitary Investment and the Decline of Urban Mortality'.
[36] Hassan, *A History of Water.* p. 9.; N. Higham, 'Turning on the Waterworks', *History Today*, 72, 10 (2022).
[37] A term used by historians that is critical of presenting history as progress towards enlightenment, based on the influential work of Herbert Butterfield, *The Whig Interpretation of History* (1931); see A. Wilson and T. G. Ashplant, 'Whig History and Present-Centred History', *The Historical Journal*, 31, 1 (1988), pp. 1–16, p. 1. Examples are the contemporary civic histories; see footnote 74.

city's poorest inhabitants and their health. From the height of the sewage crisis in 1871 to the arrival of water from Wales in 1904 citizens witnessed changes in how water was supplied, with the transition from well to tap, and the installation of a new privy system. The chapter examines this largely forgotten system of interception and the pan privy, introduced between 1873 and 1874 as part of the solution to the city's sewage crisis by reducing river pollution.[38] The solution was initially seen to be replacing ashpit privies and facilitating removal of waste from the domestic environment each week. This system saw a peak of over 38,000 pans in service by the mid-1880s and the findings offer a good case study example of how solutions themselves become contested.[39] Inhabitants had to endure poor collection practices with noisy workers and iron vans and pans at night, plus the terrible smell. Although the system was not added to after 1887, the pan privies remained in service, only gradually diminishing until the system stopped in 1914.[40] In contrast to the findings of Chapter Four on disposal methods, the findings of this chapter suggests that a single system could encompass failing and effective processes simultaneously.[41] The analysis of death rates and an 1885 sanitary survey for the three most 'unhealthy areas' in the city reveal the disastrous impact of the pan system,[42] with the number of people sharing insufficient privy accommodation being a major factor in keeping death rates high. Any benefit arriving from the improved quality of water supplied by

[38] *Report of the Sewage Inquiry Committee.*
[39] Crook, *Governing Systems,* pp. 180-183.
[40] Bunce, *History of the Corporation II*, pp. 147-148.
[41] Crook, *Governing Systems*, pp. 180-183; T. Crook, 'Thinking Ecologically: A Systems Approach to the History of MedEnv', [Blog], *MedEnv Network*, uploaded 10 September 2020, https://medenvnetwork.wordpress.com/2020/09/10/thinking-ecologically/ [accessed 30 September 2020].
[42] M. Niemi, *Public Health and Municipal Policy Making Britain and Sweden 1900-1940* (Hampshire, 2007), p. 124. The three wards determined as the unhealthiest areas because of their high death rates were St. Stephen's, St. Mary's and St. Bartholomew's.

tap to the courtyard was in effect cancelled out. The summer months were a particularly dangerous time as the city's human and animal waste, in both the domestic environment and heaped at canal sides and processing plants around the city centre, offered breeding sites for flies.[43] This chapter also reveals the work of MOH Dr Alfred Hill in trying to find solutions by suggesting alternative closet systems for those living around courtyards with a limited water supply.[44]

Chapter Seven moves away from the environmental problems and breaks new ground by examining the development of a municipal public health department. The early twentieth century marked the beginning of 'the maternalist state',[45] in which the focus moved away from improving the environment towards the role of the individual and in particular, the mother and the home.[46] The chapter seeks to establish when and how that shift in public health thinking translated into practice in Birmingham. The findings support Virginia Berridge's view that there was no 'instant switch' to the new way of thinking on public health.[47] Within Birmingham, the city's welfare services for mother and child expanded, and new posts were created, including an assistant

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[43] Flies as a vector of transmission are discussed in more detail in Chapter Eight. N. Rogers, 'Germs with Legs: Flies, Disease, and the New Public Health', *Bulletin of the History of Medicine,* 63, no. 4 (1989); A. Hardy, *The Epidemic Streets: Infectious Disease and the Rise of Preventative Medicine* (Oxford, 1993), pp. 184-186; N. Morgan, 'Infant Mortality, Flies and Horses in Later-Nineteenth-Century Towns: A Case Study of Preston', *Continuity and Change,* 17 (2002), pp. 97-132; French, C., and J. Warren, 'Medical Officers of Health and Infant Mortality: The Case of Kingston-Upon-Thames in the Late Nineteenth and Early Twentieth Centuries', *Local Population Studies*, 73 (2004), pp. 61-72; French, C., and J. Warren, 'Infant Mortality in the Canbury Area of Kingston Upon Thames, 1872–1911', *Continuity and Change,* 22, 2 (2007), pp. 253-78; N. Davie, '"An Unbidden Guest at Your Table": Purity, Danger and the House-Fly in the Middle-Class Home, c. 1870-1910,' *Cahiers Victoriens & Edouardiens*, 85 (2017), unpaginated, available at https://doi.org/10.4000/cve.3151; J. L. A. Webb Jr, *The Guts of the Matter: A Global History of Human Waste and Infectious Intestinal Disease* (Cambridge, 2020), pp. 75-76.

[44] A. Hill, *Report on the Health of the Borough of Birmingham for the year 1886* (Birmingham, 1887), pp. 45-47; for greater detail on waste-water closets, see H. Jones, 'Slop Closets', *Public Health,* 8 (1895), pp. 362-365.

[45] D. Porter, *Health, Civilisation and the State: A History of Public Health from Ancient to Modern Times* (London and New York, 1999), p. 183.

[46] V. Berridge, *Public Health: A Very Short Introduction* (Oxford, 2016), p. 57.

[47] Berridge, *Public Health*, p. 56.

MOH and tuberculosis visitors.[48] However, as Ruth Procter's study demonstrates, the co-existence of a significant voluntary network demonstrated that public services were understaffed. The breakdown of the Public Health Department's staff for 1913 demonstrates that it was equally staffed for environmental issues such as sanitary and housing inspection. Despite the shift towards the individual, slum housing in the urban environment remained a public health problem. The change in leadership with a new MOH in 1904 brought the introduction of a single assistant MOH and the beginnings of a distinct division between *medical* and *sanitary* inspection. By 1913, there were a total of six assistant MOHs, including a female officer dedicated to infant mortality.[49]

This shift towards welfare and education offered women more employment opportunities and resulted in greater professionalisation of health and social services as a female specialism.[50] Scrutiny of individual department employees reveals this professionalisation of inspection and health visiting roles, through certification, titles and pay. Although some female staff were fully qualified for sanitary inspection, like many men, there was no evidence of a battle of the sexes over inspection roles within Birmingham's department.[51] From the outset, when female health visitors were first introduced in 1899, there was a gendering of roles between sanitary inspector and health visitor, as revealed by piecing together the personal experiences of individuals – made possible in part through a memoir of a Birmingham sanitary

[48] G. A. Auden (ed.), *A Handbook for Birmingham and the Neighbourhood* (Birmingham, 1913), pp. 167-169.
[49] *Ibid*.
[50] Porter, *Health, Civilisation and the State*, p. 182.
[51] C. Davies, 'The Health Visitor as Mother's Friend: A Woman's Place in Public Health, 1900-14', *Social History of Medicine*, 1, 1 (1988), pp. 39-59, pp. 39, 41, 47.

inspector.[52] Both sexes experienced similar challenges within a context of class and certification which affected opportunities for promotion, status and levels of pay. This chapter also examines activism by professional females in the struggle for equal recognition and pay in the first decades of the twentieth century.[53] The findings support Norman Parkinson's suggestion that the struggles over certification within the professions served to assist authorities, such as Birmingham council, in setting lower scales of pay for different roles for both sexes.[54] However, Birmingham's health visitors were paid at a higher rate than those working for other large councils in Britain.[55] Despite the gender pay gap, female health visitors saw their professional status rise as they secured a permanent place in public health work. In contrast, male assistant sanitary inspectors saw their status diminish with the greater segregation of medical and sanitary inspection.

Chapter Eight concentrates on public health through the careers of Birmingham's first two MOHs to explore the shift in disease theories and medical practice and how these translated into the work of a municipal public health department. It seeks to clarify to what extent Birmingham's MOHs influenced the health and municipal policy as a result of their medical education and understanding of the causes and spread of disease in practice. The findings reveal the shift from the singular focus on sanitary

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[52] BAC, L 45 541411, H. McDonald, 'Municipal Service for Half a Century: Autobiography of a Sanitary Inspector (of the City of Birmingham Public Health Department)', typescript (1943).
[53] B. Gardiner, 'The Woman's Part in the Cause and Prevention of Pulmonary Tuberculosis', *Journal of the Royal Sanitary Institute (JRSI)*, 25, 3 (1904), pp. 884-889; H. Meredith Richards, 'The Aim and Scope of Women's Work in relation to Public Health', *JRSI*, 28 (1907), pp. 193-196; B. Gardiner, 'The varied nature of the work of Women Public Health Officials', *JRSI*, 35, 11 (1914), pp. 511-517; Davies, 'The Health Visitor as Mother's Friend', p. 52.
[54] N. Parkinson, '"Inspector of Nuisances" to "Environmental Health Practitioner": A Case Study of Title Change in the Professionalisation Process', *Journal of Environmental Health Research*, 15, 1 (2015), pp. 4-22, p. 10.
[55] Davies, 'The Health Visitor as Mother's Friend', p. 52; V. Heggie, 'Health Visiting and District Nursing in Victorian Manchester; Divergent and Convergent Vocations', *Women's History Review,* 20, 3 (2011), pp. 403-422, p. 414.

conditions and the environment to education of individuals and their behaviour.[56] Dr Alfred Hill, Birmingham's first MOH (1872-1903), worked during a sanitary revolution when environmental aspects of public health took precedence.[57] Hill's tenure reveals the MOH practising preventative medicine using sanitary science and epidemiology.[58] Hill's long tenure supports Michael Worboys' interpretation of a 'multi-layered transitional period' in the move towards germ theory rather than a pivotal shift to bacteriology.[59] Hill's practice is an excellent example of what David Barnes refers to as the 'sanitary-bacteriological synthesis', using both old and new aetiologies to explain the causes of disease.[60] In contrast, Dr John Robertson, Birmingham's second MOH (1903-1927), is an exemplar of the new generation of public health professionals bringing a knowledge of bacteriology to the role. Robertson was excited by its possibilities for tackling TB as the understanding of the causes of this disease evolved from heredity to infection.[61] However, when seen in combination with the findings of Chapter Seven, Robertson's professionalised department by 1913 was operating a combination of public health models.

John Welshman suggests that little attention has been paid to the influence of eugenics on local MOHs or local policy, and Chapter Eight explores the extent of this

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[56] D. Porter, *Health, Civilization and State,* pp. 165-195; M. Niemi, 'Public Health Discourses in Birmingham and Gothenburg 1890-1920' in S. Sheard and H. Power (eds), *Body and City: Histories of Urban Public Health* (Aldershot, 2000), pp. 123-142, p. 129; Berridge, *Public Health,* pp. 55-60.
[57] The 'sanitary revolution' is considered to have begun in the last quarter of the nineteenth century in Western Europe and North America. Luckin*, Death and Survival* includes Luckin's previously published work, 'Evaluating the Sanitary Revolution: Typhus and Typhoid in London, 1851-1900' (1984).
[58] M. Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain 1865-1900* (Cambridge and New York, 2000), p. 111; J. Steere-Williams, 'Edward Ballard and the Practice of Epidemiology in the 19th-Century United Kingdom', *American Journal of Public Health,* 108, 12 (2018), pp. 1632-1638.
[59] Worboys, *Spreading Germs*.
[60] D. S. Barnes, *The Great Stink of Paris and the Nineteenth-Century Struggle against Filth and Germs* (Baltimore, 2006), pp. 134-135.
[61] Hardy, *Epidemic Streets*, p. 255; Worboys, *Spreading Germs,* p. 112.

influence in Birmingham. [62] The findings reveal a significant engagement with eugenic ideas by the city's MOH (Robertson) and leading council members between 1911 and 1914.[63] Robertson was a founding committee member, along with some of the city's prominent councillors, academics and clergy, of the Birmingham Heredity Society (BHS) in 1910, later affiliated to the EES. Exposure to this scientific ideology may have influenced municipal policy towards public health and social hygiene, education policy for those considered 'feeble-minded', and town planning.[64] Robertson continued to engage intermittently with the later Eugenics Society and chaired a local branch of the British Social Hygiene Council. Influenced by eugenic ideas and the housing situation in the city, Robertson's specialist interests shifted towards housing reform and town planning as he believed that slum housing caused not only bad health, but also bad behaviour.[65]

This greater understanding of these two MOHs in their medical context enables a reassessment of the effectiveness of social interventions to tackle infant mortality in Birmingham.[66] Chapter Eight challenges previous judgements and argues that single public health issues in a locality should not be examined in isolation. A fuller

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[62] J. Welshman, 'Eugenics and Public Health in Britain, 1900-40: Scenes from Provincial Life', *Urban History*, 24, 1 (1997), pp. 56-75, p. 56.
[63] *Ibid.*
[64] BAC, L50.7/220665, Birmingham and Edgbaston Debating Society Addresses, Valedictory Address by Albert Lucas, 'Heredity and Eugenics', 29 September 1909; Bham Inst/D27/229788, Birmingham Heredity Society, tickets, circulars and cuttings 1911; L50.6/237900, Annual reports of Birmingham Heredity Society 1910/11; 1911/12; 1912/13; 1913/14. See P. L. Garside, '"Unhealthy Areas": Town Planning, Eugenics and the Slums, 1890–1945', *Planning Perspectives,* 3, (1988), pp. 24-46; Welshman, 'Eugenics and Public Health in Britain'.
[65] Professor Sir John Robertson, 'The Slum Problem', *JRSI,* 51 (1930-1), pp. 279-284 quoted in Garside, p. 35.
[66] Niemi, 'Public Health Discourses in Birmingham and Gothenburg'; C. Galley, 'Social intervention and the Decline of Infant Mortality: Birmingham and Sheffield c. 1870-1910', *Local Population Studies*, 73 (2004), pp. 29-50; C. Galley, 'Health Visitors: How much difference did they make? – a reply to Michael Drake', *Local Population Studies*, 76 (2006), pp. 69-75; Niemi, *Public Health and Municipal Policy Making*; R. J. Procter, 'Infant Mortality: A Study of the Impact of Social Intervention in Birmingham 1873 to 1938', (Unpublished MPhil Thesis, University of Birmingham, 2011).

understanding of local specific conditions, such as sanitation or council priorities and policy, alongside medical knowledge and practice for the time should be considered in any analysis. In combination with the findings of Chapter Six, it also argues that the impact of waste management systems for the city has been underappreciated. The annual summer plague of flies and its link to the spread of disease and increased infant mortality provided a vector of transmission that was not understood at all by the first MOH, or by the city's second MOH until the second decade of the twentieth century.

Finally, the findings suggest that medical recommendations from MOHs to prevent the spread of disease were mostly supported by the council and implemented. Conversely, recommendations relating to wider social policy and entailing greater expenditure, such as the demolition of slum housing and the building of new 'healthy homes', had little impact.[67] Due to the chronic housing situation in the city, both MOHs had to rely on piecemeal sanitation and building improvements. They could only repeat their calls for new housing in their annual reports, until such time as national policy forced change at a local level through legislation and financial support.[68]

Overall Conclusions

This thesis makes two core arguments. Firstly, that the image of Birmingham closely linked to Joseph Chamberlain and his impact on sanitation and municipal socialism is

[67] A. Hill, *Annual Report of the Medical Officer of Health for Birmingham 1897* (Birmingham, 1898).
[68] S. Pepper and P. Richmond, 'Homes Unfit for Heroes: The Slum Problem in London and Neville Chamberlain's Unhealthy Areas Committee, 1919-21', *The Town Planning Review,* 80, 2 (2009), pp. 143–171.

not justified. That progressive narrative was built upon municipalisation of the gas and water supplies and an improvement scheme that created the commercial area of Corporation Street under the auspices of a Housing Act.[69] As Hennock suggests, there was 'a welding' of public health and civic pride.[70] The significance of the three parliamentary acts enacted during Chamberlain's mayoralty has been exaggerated in respect to sanitation in Birmingham. This study has demonstrated that other council individuals, including Avery, Harris, George Baker and Thomas Martineau, had a greater influence on sanitation than Chamberlain. Similarly, the civil engineers for the city, Water Department and BTRDDB, William Till, John Gray and John Duncan Watson were also important players. [71] Historians Asa Briggs, E. P. Hennock, Roger Ward, Derek Fraser, Ian Cawood, Chris Upton and Andrew Reekes have all critiqued the narrative of Chamberlain, with Richard Vinen most recently pointing out that this image 'was not all that it appeared'.[72] They have highlighted that Birmingham had fallen behind following municipal action already taken by other local authorities, but they have fallen short of offering the evidence to explain why the view of Chamberlain and Birmingham's council being so closely linked with sanitation reform is not valid. There is an absence of a detailed history of Birmingham's sanitation in the period after Chamberlain's mayoralty – a lack which this thesis addresses. After

[69] Briggs, *Victorian Cities* (Middlesex, 1968), pp. 184-240; Hennock, *Fit and Proper Persons*, pp. 61-176; Hunt, 'Joseph Chamberlain and the Municipal Gospel', *Building Jerusalem,* pp. 313 – 380; Gherke, 'A Radical Endeavour', pp. 23-57; Fraser, 'Joseph Chamberlain and the Municipal Ideal'; Vinen, *Second City*, pp. 69-110.
[70] Hennock, *Fit and Proper Persons*, p. 128.
[71] See Appendix 1: Index of Persons.
[72] Briggs, *Victorian Cities*, pp. 184-240; Hennock, *Fit and Proper Persons,* pp. 61-176; Fraser, 'Joseph Chamberlain and the Municipal Ideal'; Ward, 'Birmingham: A Political Profile', pp. 159-169; I. Cawood and C. Upton (eds), *Joseph Chamberlain: International Statesman, National Leader, Local Icon* (Basingstoke, 2016); A. Reekes, *Two Titans, One City: Joseph Chamberlain and George Cadbur*y (Alcester, 2017); A. Reekes, *The Birmingham Political Machine: Winning Elections for Joseph Chamberlain* (Alcester, 2018); Vinen, *Second City*, p. 98.

Chamberlain moved into the national arena, the other individuals involved in the acts of municipalisation and Liberal take-over of the council were left to carry on.[73] Their story is very rarely told or is overshadowed by Chamberlain's role in British politics.[74] The telling of Birmingham's history for that period has tended to follow Chamberlain's career and his impact on party politics, rather than looking closely at the development of local government after he left local administration. It is precisely because the history of sanitation has not been previously explored in detail that the unjustified view has persisted beyond Chamberlain's lifetime into the present day.[75]

This thesis offers a distinctive contribution to scholarship as it encompasses multiple perspectives, looking at those who governed, those who worked for local government, and the inhabitants of Birmingham's back to backs. It unpicks the narrative of achievement and progress that was manifested in new schools, civic buildings and monuments. That was the narrative promoted by the contemporary council histories and images such as H. W. Brewer's *Birds-Eye View of Birmingham in 1886* showing the civic centre of the city.[76] Monuments such as the Joseph Chamberlain Memorial Fountain have acted as shrines to this constructed vision and have ensured its longevity. As this thesis reveals, when the fountain was unveiled in 1880, the council's priority had changed to replacing old fire plugs with hydrants but many of the city's poorest inhabitants were still using polluted wells, although some

[73] Hennock, *Fit and Proper Persons*, p. 129
[74] Ward, Birmingham: A Political Profile', pp. 159-169; Reekes, *Birmingham Political Machine*.
[75] Ward, 'Birmingham: A Political Profile', pp. 174-5.
[76] J. T. Bunce, *History of the Corporation of Birmingham, Vol. I* (Birmingham, 1878); Bunce, *History of the Corporation II* ; C. A. Vince*, History of the Corporation of Birmingham, Vol. III* (Birmingham, 1902); C. A. Vince, *History of the Corporation of Birmingham, Vol. IV* (Birmingham, 1923); J. T. Jones, *History of the Corporation of Birmingham, Vol. V* (Birmingham, 1940). For image, see Birmingham Museums Trust Digital Asset Resource, '1931V554 Birds-Eye View of Birmingham in 1886'
https://www.birminghammuseums.org.uk/collection/picture-library

had been closed. More importantly, the new pan privy system was expanded across the city as part of a policy to discourage water closets (WCs) in response to the sewage crisis and legal action over river pollution.

This feeds into the second core argument as the thesis considers the effectiveness of municipal responses to Birmingham's environmental and sanitation problems and whether those responses reduced mortality. It has argued that after the turning point of 1868, there was a forty-year journey of local government development and investment in sanitary infrastructure before Birmingham had the *capability* to address poor sanitation for all citizens. Those citizens who were fortunate enough to be able to live in properties that enjoyed private domestic facilities, with WCs connected to sewers, experienced better health outcomes, and benefited from the improved quality of the piped water supply. However, as Hill lamented in his MOH 1897 report, the overall death rate for the entire city remained unchanged for fifteen years, due to considerably higher rates in the most densely populated central wards – a fact that of course contributed to the stubbornly persistent overall rate.[77] For the poorest citizens living in back-to-back houses, as Chapter Six reveals, the death rates did not start to decline until after 1907.

When Birmingham received the accolade of 'best-governed city' in 1890 out of admiration for its administration and business principles,[78] this coincided with the start of the most difficult decade for the council and for the inhabitants of the back to backs. Until the water supply issue was resolved, the transition to full water-carriage could not be accelerated and many citizens had to endure an environment that

[77] Hill, *Report [1897*].
[78] Ralph, 'Best-Governed City'.

constituted a danger to their health and life. The diarrhoea epidemic of 1897, compounded by the lack of WCs, was testament to this situation. Despite better quality, the struggling water supply system using local sources was under severe pressure. Climate too played its part in severely disrupting the water service between 1893 and 1895 with a drought, and heavy frosts that resulted in a serious leak from the system (Chapter Five). Although, construction of the new supply had begun in 1893, the expected completion was still a decade away and the first part of the scheme ran seriously over budget, placing the council under great financial pressure.

Hence, the conclusion from this study is that instead of a sanitary revolution in the last quarter of the nineteenth century, there was a sanitary foundational period. This foundational period did not have an immediate positive impact on the health of the city's poorest between 1870 and 1904. Better sanitation was dependent on class, occupation and the type of housing lived in. Because life expectancy in Birmingham from the late 1870s to the late 1880s ranged between thirty-five and forty-three years, it is suggested that the foundational period benefited future generations.[79] This study supports Robert Millward and Frances Bell's point that the year when powers to borrow money were granted is not an indicator of when utilities became active and had an impact.[80] Equally, this thesis demonstrates the importance of understanding local specifics. Although legal challenges over river pollution were responsible for motivating change in Birmingham, they nevertheless hindered progress and an

[79] R. Woods, 'Mortality and Sanitary Conditions in Late Nineteenth-Century Birmingham' in R. Woods and J. Woodward (eds), *Urban Disease and Mortality in Nineteenth-Century England* (London, 1984), p. 191; J. Reinarz, 'Industry and Illness: Investing in Health and Medical Provision', in C. Chinn and M. Dick, *Birmingham: The Workshop of the World* (Liverpool, 2016), pp. 239-259, p. 253-254. Age expectancy of 35 years quoted by Reinarz is based on the MOH Report for 1878.

[80] R. Millward and F. Bell, 'Choices for town councillors in nineteenth-century Britain: investment in public health and its impact on mortality' in S. Sheard and H. Power (eds), *Body and City: Histories of Urban Public Health* (Aldershot, 2000), pp. 143-165, p. 163.

earlier transition to WCs for all citizens. To resolve the problem of environmental pollution, another evil was introduced in the form of the pan privy. That system could not be fully discarded until the new abundant water supply (along with the developments at Saltley and Minworth to treat greater volumes of waste) enabled acceleration of the transition to full water-carriage waste management.

In turn, this thesis contributes new knowledge that feeds into the debates surrounding urban sanitation and its effect on mortality. Woods considered in his study whether the court environment promoted contagious disease and he attempted to make links between specific disease mortality and sanitary conditions. Woods came to no firm conclusions, citing 'the difficulties involved and the complexity of the associations at work'. According to Woods, the associations included poverty, bad housing, bad diet and occupational factors; moreover, he suggested that the degree of association between sanitary condition and mortality variables was lower than one might expect, if the former influenced the latter.[81] This research, considering sanitation and municipal responses rather than specific diseases, suggests a strong link due to *the lack* of proper sanitation and effective waste management. It advances current understanding on the impact of pail systems, on hygiene and on the proliferation of flies increasing the transmission pathways for disease.[82] It was only after more widespread sanitation, coupled with a clearer understanding of how disease and germs are spread, that mortality rates started to decline in the city's central wards. The experience in Birmingham does not fully support suggestions that sanitation was a significant factor in mortality decline in the last quarter of the

[81] Woods, 'Mortality and Sanitary Conditions', p. 200.
[82] Aidt et al., 'New Perspectives on the Contribution of Sanitary Investments', p. 657.

nineteenth century;[83] neither does it substantiate McKeown's suggestion that a quarter of the decline in that period could be attributed to sanitary improvements.[84] Instead, the evidence from Birmingham points to more widespread sanitation being a major factor in reducing mortality in the first quarter of the twentieth century, due to the eventual transition to full water-carriage and the introduction of indoor plumbing and private toilet facilities in new housing. This was important because, in tandem with a reduction in horse-drawn transport, it reduced the number of potential breeding grounds for flies and facilitated better hygiene and waste management practices. Equally, the proliferation of mother and baby services and better education on infant feeding and clean milk helped to reduce infant mortality.[85]

The sanitation history of England's second largest city has underscored the importance of place-specific contextualisation when considering the contribution of urban sanitary investment to mortality decline.[86] For Birmingham, borrowing for sanitary projects proved not to be the whole story: this supports Bernard Harris and Andrew Hinde's suspicion that there is a need for more local research to learn how authorities used financial support and the nature of the challenges they faced.[87] Equally, Birmingham's experience advances current understanding to highlight the

[83] S. Szreter, 'The Importance of Social Intervention in Britain's Mortality Decline c. 1850-1914: A Reinterpretation of the Role of Public Health', *Social History of Medicine*, 1 (1988), pp. 1-37, pp. 22, 25-26. This article was later slightly revised and included as chapter 4 in S. Szreter, *Health and Wealth: Studies in History and Policy* (Rochester, 2005).
[84] McKeown and Record (1962) cited in Woods, 'Mortality and Sanitary Conditions', p. 202.
[85] Hardy, *Epidemic Streets*, pp. 267-294; C. Galley, 'Social intervention and the Decline of Infant Mortality: Birmingham and Sheffield c. 1870-1910', *Local Population Studies*, 73 (2004), pp. 29-50; C. Galley, 'Health Visitors: How much difference did they make? – a reply to Michael Drake', *Local Population Studies*, 76 (2006), pp. 69-75; Niemi, *Public Health and Municipal Policy Making*; J. Wacher, "'Lessening Our Greatest Scourge": Management of the Tuberculosis Milk Problem in Birmingham at the Turn of the Nineteenth Century: Midland History Prize Proxime Accessit 2006', *Midland History,* 33, 1 (2008); Procter, 'Infant Mortality'.
[86] Luckin*, Death and Survival*, p. 117.
[87] Harris and Hinde, 'Sanitary Investment and the Decline of Urban Mortality', p. 369.

importance of the sequence of sanitary interventions and how they can become 'entangled' whilst operating under different administrative structures.[88] In Birmingham, water supply and sewerage were the responsibility of the city council but sewage treatment came under the joint drainage board which involved other authorities before 1911. The quality of Birmingham's water supply improved before the problem of quantity was finally resolved by the new supply from Wales, but this did little to address the multiple pathways of disease transmission in the city's courts of back to backs.[89]

The sanitary foundational period in Birmingham was significant and its history deserves to be better known. It began with a sewage crisis, followed by the development of sewage treatment infrastructure between Saltley and Minworth. Today the latter is one of the largest sewage treatment plants in Europe, serving a population equivalent of 1.75 million, and is currently Severn Trent's largest renewable energy facility.[90] The sanitary foundational period also motivated the ambitious construction of the Elan Valley dams and reservoirs which remain integral to Birmingham's water supply.

Future Research

As a local urban environmental history, this study explores the theme of pollution in the city, but not the impact of atmospheric pollution on health, leaving this as an area

[88] Crook, 'Thinking Ecologically'; Aidt *et al.*, 'New Perspectives on the Contribution of Sanitary Investments', p. 657.
[89] Aidt *et al.,* 'New Perspectives on the Contribution of Sanitary Investments', p. 657.
[90] 'Minworth Thermal Hydrolysis Plant, Severn Trent', *MWH Treatment* (2023) https://mwhtreatment.com/case-study/minworth-thermal-hydrolysis-plant/ [accessed 12 November 2023].

for future research. Donna Taylor in her study of Birmingham's governance between 1769 and 1852 notes the increased environmental problem of smoke due to steam engines.[91] Taylor refers to Alexis Tocqueville in his *Journeys to England and Ireland* in 1835, where he observed that in Birmingham, 'everything is black, dirty and obscure' and that industrious busy people had 'faces brown with smoke'.[92] Taylor also notes that Birmingham Street Commissioners appointed a smoke abatement inspector as early as 1830 and that Birmingham and Manchester took a similar approach in considering smoke 'a "nuisance" relating to comfort rather than public health'.[93] That was before the period examined by the present study when population and industry continually increased throughout the rest of the century. The later council committees relating to borough inspection and public health might reveal much about later municipal attempts to tackle smoke nuisance and how it impacted the health of the city. Furthermore, this thesis can feed into that research as Chapters Four and Five reveal the development of waste management systems with municipal destructors and energy plants. New technology powered by coal was required to deal with the waste of the city. This fact, along with municipal provision of public utilities, essentially made the council one of the major polluters of the air, in combination with the city's industry and domestic users. How did becoming a major producer of smoke fit with being the sanitary authority responsible to control smoke nuisance, and how was this viewed?

[91] D. Taylor, 'Governance and Locality in the Age of Reform: Birmingham 1769-1852', (Unpublished PhD Thesis, University of Birmingham, 2017), pp. 59-65.
[92] Alexis Tocqueville, *Journeys to England and Ireland (*ed. J. P. Mayer*)* cited in Taylor, 'Governance and Locality', p. 61.
[93] Taylor, 'Governance and Locality', p. 62

More broadly, as an urban and environmental history, the analytical framework offered by this thesis can be used for other place-in-context studies to explore responses under similar circumstances or for comparative studies between localities.[94] Primary sources used for this study reveal that Birmingham's chief engineers William Till (city surveyor) and John William Gray (chief engineer to waterworks) visited cities in France and Germany between 1880 and 1881, examining the infrastructure, technology and practices used there. Similarly, in 1905 a deputation of the Housing Committee visited Germany to study housing reform and town planning; this suggests that there is more to explore about British and European urban connections and the transmission of ideas and practices.[95]

Sanitation developments and river pollution in Birmingham offer scope to investigate and focus on the records of central government departments to examine the relationship between central and local authorities and the former's impact on municipal plans and policy making. Similarly, as suggested by Graham Mooney, much remains to explore about the interactions between local authorities and other centralised institutions such as the Local Government Board or the Royal Sanitary Association.[96] Given the interactions with the public health reform movement, the hosting of the Social Science Congress in Birmingham in 1868 suggests that there is scope to investigate, compare and contrast the impact of congresses in other localities.[97] Resistance to sanitary improvement and water supply was explored

[94] A. Wilson, 'Technology and Municipal Decision Making: Sanitary System in Manchester 1868-1910' (Unpublished PhD Thesis, University of Manchester, 1990); S. Sheard, 'Nineteenth Century Public Health: A Study of Liverpool, Belfast and Glasgow' (Unpublished PhD Thesis, University of Liverpool, 1993); Ewen, *Urban History*, p. 23.
[95] Nettlefold, 'Birmingham: City Extension and Town Planning', p. 99.
[96] G. Mooney, *Intrusive Interventions: Public Health, Domestic Space and Infectious Disease Surveillance in England, 1840-1914* (Rochester, New York: University of Rochester Press, 2015), p. 23.
[97] Huch, 'The National Association for the Promotion of Social Science', pp. 282-283.

throughout this study but with a primary focus on Birmingham's ratepayer association. Other ratepayer associations existed in the surrounding areas of Handsworth, Aston Manor, King's Heath and Harborne when they were separate local authorities prior to the boundary changes of the twentieth century: these would merit further investigation if records survive.

Lastly, and perhaps offering the richest source of all, there is scope for further extensive analyses of Birmingham MOH annual reports to glean further insights into local, social and urban history and the social history of medicine.[98] These documents can offer valuable datasets about specific diseases and epidemics, and yield information on housing and population; the impact of climate; details of type of sanitary work undertaken; and the shifting focus of public health.

Final Comments

This study shows the importance of understanding the broad political, social and economic context of a place when looking at the history of public health and sanitation. In 2024, sewage, river pollution and water supply in England and Wales are still being debated. The disposal of ever greater volumes of waste in ways that do not cause environmental harm remains the challenging issue it always has been. At a time when society and those who govern are considering responses to rising populations, climate change, waste management and its environmental damage, how individuals in Birmingham between the 1840s and 1920s responded to similar

[98] Available online via Wellcome Collection https://wellcomecollection.org/collections.

problems, may provide insights and inspire creative solutions to difficulties that continue to beset us in the twenty-first century.

Appendix 1

Index of Persons

An index of the relevant individuals who are referred to in this thesis or held positions relating to public health and sanitation. It has been organised in separate sections to distinguish between administrators and paid officers of the council. These short biographies have been produced, utilising existing biographies (if available) through the *Oxford Dictionary of National Biography (ODNB)* and obituaries from local news sources or professional societies.

Councillors/Aldermen

Avery, Thomas (1813-1894)[1]

Birmingham scale manufacturer, councillor, alderman, mayor and JP.

Born into the long-established Birmingham family of scale makers, the second son of William Avery. Thomas was a traveller for W. and T. Avery all around Britain; the firm in 1851 employed at least 150 men and boys at its premises in Digbeth. He inherited the company with his brother William Henry and established a reputation for his trustworthiness and intelligence, being particularly noted for his aptitude with figures and statistics. Avery was a magistrate for the town and for the counties of Warwick and Worcester and served as governor, trustee or treasurer for a number of local hospitals and institutions (Birmingham and Midland Institute, Mason College and Spring Hill College for the dissenting ministry). He was also elected director of the Birmingham Joint Stock Bank in 1866 (incorporated into Lloyds Bank in 1889).

As a Congregationalist, attending Carr's Lane Church, Avery was an early proponent of the civic gospel. He was encouraged (most likely by the preacher Robert Dale) to join the council for St. Martin's ward in 1862, right at the height of Economist control of the council. By 1864, he withdrew his capital from the family business, leaving his brother as sole proprietor, and committed himself to civic purposes almost to the end of his life. In contrast to the artisans or small business-owning councillors at that time, Avery was from the wealthy elite and was used to dealing with the financial requirements of a large business. In his first years as councillor, he took charge of

[1] For biographical entry, see A. McConnell, 'Avery, Thomas (1813-1894)', *Oxford Dictionary of National Biography (ODNB)* http://doi,org/10.1093/ref:odnb/46576 [accessed 17 June 2020].

the Finance Committee and in 1866, wrote an article, ‘On the Municipal Expenditure of Birmingham’ for the *Journal of the Statistical Society of London*. He quickly made enemies among the Economist faction who dominated the Public Works Committee and was often singled out for particular attack. Avery was elected alderman in 1868, was mayor for a few months in 1867 when the elected mayor stepped down to become an MP, but was subsequently elected mayor in 1868 and again in 1881.

The 1868 Social Science Congress in Birmingham was a transformative experience for Avery during his mayoralty. Always a philanthropic supporter of hospitals, his attention turned to the public health movement, drawn particularly by their use of statistics to define health and disease. Although it involved battles with the Economists, Avery took charge of sanitation reform in the city for many years, and with the help of Chamberlain and other new Liberal councillors achieved municipalisation of the water supply. With his reputation for financial acumen, Avery was entrusted with many of the most expensive improvements (prior to the Elan Valley Scheme). Acutely aware of ratepayer resistance he often worked to source ways to fund the improvements without unnecessarily burdening the ratepayer. Once the Act of Parliament was passed, it was Avery who single-handedly negotiated the final purchase of the waterworks on behalf of the council.

Avery was crucial to addressing the sewage crisis. He took ownership of this issue and from the Sewage Inquiry of 1871 until his retirement, he oversaw the development of the sewage treatment works and the establishment of the united authority, the Birmingham Tame and Rea District Drainage Board, which he chaired from 1877-1892. However, he did not enjoy a perfect record in terms of sanitation reform and he is rightly remembered less favourably for the implementation of the ‘pan’ conservancy system, based on the system in operation in Rochdale. Although attempted in good faith as an alternative to the midden or ashpit system, it was a public health disaster in the overcrowded back-to-backs.

Avery was a moderate conservative but as he shared a common goal for improvements, he formed alliances with Liberal councillors, working closely with William Harris at the drainage board for many years. Avery was at the forefront of Birmingham’s local government for thirty years, leading the municipal response to river pollution and sanitation. He retired in 1892 due to ill health and was granted honorary freedom of the city. He died in 1894 at his home in Edgbaston and left generous bequests to local colleges, hospitals and institutions.

Baker, George (1825 - 1910)[2]

Councillor, alderman, mayor and JP.

Born in 1825 into one of Birmingham's oldest Quaker families. His great-grandfather Samuel was one of the fifty townsmen appointed to the new Street Commissioners in 1769. After education elsewhere, George Baker returned to Birmingham at the age of fifteen to join his father's business. In 1845 he became one of the first teachers at the Severn Street Day School, teaching the illiterate to read and write and learn the scriptures. He became increasingly involved with the public life of the town and was one of the first committee members of the Birmingham Liberal Association. No doubt influenced by the civic gospel he joined the council in 1865 for St. George's ward. Baker was on several council committees, and along with Avery he was a member of the Sewage Inquiry and Sewage Committees and the Drainage Board; he took over as Chair of the Drainage Board after Avery's retirement in 1892. He also took another leading role with the council's Improvement Committee. Baker was elected alderman in 1874 and became mayor after Chamberlain's three successive terms in 1876.

At his death in 1910, he was the oldest member of the council after a civic career spanning 45 years. Always a Liberal in politics (remaining loyal after the split over Home Rule), he was one of the first of the new generation of Liberals to enter the council and was actively involved in the National Education League.

Barratt, Dr Alfred (1828 – 1909)[3]

Physician, councillor, alderman.

Born in Birmingham and medically trained at Queen's College, Birmingham. He joined the council in 1870 as one of the reforming Liberal group for the Hampton Ward (St. George's) while still in private practice and was elected alderman in 1885. Barratt was a member of the Borough Inspection Committee and the Sewage Inquiry, Sewage and Health Committees from their formation and therefore a key member of the group that was concerned with public health reform. Barratt was also involved with the Birmingham Tame and Rea District Drainage Board from its formation, chairing the Works Sub-Committee which was concerned with the management of the sewage farm. He was made Vice-Chair in 1894 but remained involved with other local institutions such as the Board of Guardians. At the time of his death he lived in Edgbaston, where he had resided since retirement from medical practice.

[2] For a more extended biography, see S. Pettitt, 'Baker, George (1825-1910)', *ODNB,* http://doi.org/10.1093/ref:odnb/101111 [accessed 17 June 2020].
[3] *Birmingham Weekly Pos*t, 20 November 1909.

Bunce, John Thackray (1828 – 1899)[4]

Journalist and newspaper editor.

Born in Faringdon, Oxfordshire, Bunce moved to Birmingham when nine years old as his father established a watchmaker and silversmith business in Digbeth. Educated at the Gem Street School he then served a printing apprenticeship with *Midland Counties Herald,* before joining the Tory-supporting *Aris's Gazette* as a reporter and then editor. However, Bunce came to support the Liberals politically, which resulted in his resignation from the *Gazette* in 1862 and the start of a thirty-six-year editorship of the *Birmingham Daily Post* and *Birmingham Weekly Post*. By this stage, Bunce was a key individual in the non-conformist Liberal elite that was energised by the civic gospel and who came to dominance in the town. Despite never becoming a councillor, Bunce was still actively involved in the civic life of the town. His position ensured supportive representation of the Birmingham Liberal Association and the National Education League and of Joseph Chamberlain's political career. After the split over Home Rule, Bunce eventually transferred his support to Chamberlain and the Liberal Unionist cause.

Politics aside, Bunce supported the free libraries movement and was a founder of the Shakespeare Library in the town. He was a trustee of Mason College (later University of Birmingham) and was principally involved in the establishment of the Birmingham Municipal School of Art (the first municipally-run art school in the country). He continued to support the school, establishing scholarships so that students from all social backgrounds could attend, including female students who wished to establish professional careers in art and design. His two surviving daughters attended the school.

Bunce was a keen local historian and can be considered the chronicler of the civic gospel period in Birmingham. He published works on institutions and people and the *History of the Corporation of Birmingha*m, *Vol, I* (1878) and *Vol. II* (1885) which charts the history and development of the town throughout most of the nineteenth century. He retired from journalism in 1898 and was made a Freeman of the City in 1899, dying that year at his home in Edgbaston.

[4] For full biographical entry, see S. Hoban, 'Bunce, John Thackray (1828-1899)', *ODNB,* http://doi.org/10.1093/ref:odnb/104428 [accessed 14 August 2020]; A. Reekes, *The Birmingham Political Machine: Winning Elections for Joseph Chamberlain* (Alcester, 2018), pp. 116-118.

Chamberlain, Joseph (1836 – 1914)[5]

Industrialist and local politician and statesman, MP for Birmingham West (1876-1914)

Born in Camberwell, Surrey, the son of a cordwainer and metal manufacturer. Educated at University College, London, he joined his father, learning the financial side of the business. His father then invested in a venture by his brother-in-law, J. S. Nettlefold, who manufactured wood screws in Birmingham. Chamberlain was sent to look after his father's investment. The venture was successful and Nettlefold and Chamberlain turned Joseph Chamberlain into a successful industrialist. The Nettlefolds introduced Joseph into their Unitarian elite circle which included many prominent families. As was typical for the time, his first two marriages were within this close-knit group of families.

Chamberlain joined the council in 1869 inspired by the civic gospel. Although others had been trying to reform the council before him, Chamberlain's arrival marked the period of the changing of the guard in the council between 1869 and 1876 when the Birmingham Liberal Association gained the upper hand and Chamberlain emerged as their leader. Simultaneously, Chamberlain was a driving force in the National Education League, formed in Birmingham by local businessmen and the preachers of the civic gospel who all shared a liberal vision for civic-controlled elementary schools funded by taxation.

Chamberlain's three successive terms as mayor propelled him and the town into national politics. It was during his mayoralty of 1873-6 that key legislation for municipalising the gas and water was passed, along with a major improvement scheme for Birmingham. Chamberlain, the motivating force behind the gas scheme, generated a new vital source of revenue for the corporation and established his reputation. He played a more assistive role in the water scheme, making key speeches to smooth its passage through the council chamber and Parliament. The Improvement Scheme saw the removal of a slum area and the creation of Corporation Street but it coincided with a depression and the costs attracted much criticism. Chamberlain was the first person to be granted the freedom of the city, in 1888, in recognition of his services to Birmingham and his popularity in the city endured for the rest of his lifetime.

Elected as MP for Birmingham in 1876, Chamberlain entered national politics and his attention turned away from civic matters. However, Birmingham and Highbury (the family home) remained his political power base and his two sons followed him into local and national politics. He did, however, perform one more civic duty to the city that had a lasting legacy when he worked to found and generate funding for the

[5] For a full biographical entry, see P. T. Marsh 'Chamberlain, Joseph [Joe] (1836 – 1914), *ODNB,* http://doi.org/10.1093/ref:odnb/32350 [accessed 17 June 2020].

University of Birmingham (transforming Mason College). The charter was granted in 1900 and Chamberlain was made the first chancellor. The university better served the purposes of an industrial city and its medical school admitted and conferred degrees to female medical students.

Chamberlain was a prominent, but often controversial, politician of the late nineteenth and early twentieth centuries. His first minor cabinet role was as president of the Board of Trade in 1880 but he went on to serve as Colonial Secretary (1895-1903). He was instrumental in two party splits over Home Rule for Ireland (Liberal) and reform of tariffs (Unionist) and was criticised for his imperialist vision and the South Africa War (1899-1902). Chamberlain resigned from the cabinet in 1903 to concentrate on the Tariff Reform campaign but remained MP for Birmingham West until just before his death in 1914, despite having suffered a serious stroke in 1906.

Cook, Sir William Thomas Gustavus (1834-1908)[6]

Industrialist, councillor, alderman, chair of Health Committee 1876-1908

Born in Stroud, Gloucestershire, he undertook an apprenticeship in the pin and wire trade in Birmingham. As an engineer he progressed from workman to being proprietor of Harrison and Cook, Britannia Mills, Princip Street to produce tacks, nails and pins. Elected to the council in 1873, he was made alderman in 1882 and served as mayor in 1883/4. He was involved with Public Works, Improvement and General Purposes committees but most notably as the long-serving chair of the Health Committee, supervising the city's Public Health Department at the time when greater responsibilities were placed upon local authorities. The committee was subject to scrutiny a couple of times under his tenure for scandals involving the interception system and slum housing. However, subsequent internal enquiries absolved Cook and the committee. Cook also served as justice of the peace for the city and for Warwickshire.

Politically, Cook was a Radical Liberal, part of the new wave of councillors promoted by the Birmingham Liberal Association. He was elected as MP in 1885/6 for Birmingham East but lost the seat a year later to the Conservatives. At the Liberal Party split he remained loyal to Gladstone and directed his energies to local government and many other local organisations and societies, primarily the city's Hospital Saturday Fund. Cook was knighted in 1906 and he died in January 1908 at the age of 73 while visiting Blackpool for recuperation after a spell of poor health.

[6] Image can be seen at Birmingham City Council, Portrait Collection https://www.birmingham.gov.uk/info/50139/explore_and_discover/1735/portrait_collection [accessed 25 November 2023].

Harris, William (1826-1911)[7]

Architect/surveyor, councillor, political strategist, clerk to the Drainage Board (1877-1911)

Liberal councillor, member of Sewage Inquiry and Sewage Committees and long-serving clerk to the Birmingham Tame and Rea District Drainage Board (a paid role which his son took over after his death). Inspired through the civic gospel, as a member of George Dawson's Church of the Saviour, he was consistently involved in the civic and cultural life of the town and city until his death in 1911. Although a councillor for only a couple of years, he maintained council involvement as a non-member serving on committees for free libraries, the Shakespeare Memorial Library and the Art Gallery and Museum. He was also a member of the council of the Birmingham and Midland Institute.

Politically, Harris was a founder member of the Birmingham Liberal Association which was formed in 1865 and was extremely influential in the Liberal party after 1868. He was also a founder member of the National Education League. A close ally and supporter of Chamberlain, Harris was responsible for the electoral organisation that gave the Liberal Party the upper hand in Birmingham and his methods were extended nationally. However, at the split over Home Rule, he did not follow Chamberlain, remaining loyal to Gladstone, and he gradually withdrew from politics. Harris's contribution to the city, as the architect of the Liberal takeover of the council, and his civic work in connection with sanitation is often overshadowed by the story of Chamberlain.

Martineau, Sir Thomas (1828 – 1893)[8]

Lawyer, councillor, alderman, mayor.

Born in Birmingham, Thomas Martineau was part of the close-knit Unitarian elite in Birmingham in which many connections through marriage were made between the most prominent families of the town. After his education, Martineau was articled to a maternal cousin, Arthur Ryland, a noted Birmingham solicitor, and entered into partnership.

Like many of his contemporaries on the council, Martineau was a member and president of the Birmingham and Edgbaston Debating Society, where his friendship with Joseph Chamberlain developed. Despite his close Liberal connections, he

[7] Reekes, *The Birmingham Political Machine,* pp.17-18.

[8] For biographical entry, see A. Rowley, 'Martineau, Sir Thomas (1828-1893), *ODNB,* http://doi.org/10.1093/ref:odnb/49348 [accessed 17 June 2020].

concentrated on his legal career and did not enter the council until 1876, representing the Edgbaston ward. He was elected alderman in 1883 and was mayor three times between 1884 and 1887.

With his legal expertise he took responsibility for the Birmingham Consolidation Bill, being instrumental in establishing Birmingham as an assize town, and for the erection of the Victoria Law Courts (he received his knighthood in 1887 after Queen Victoria had laid the foundation stone for the courts). The next major project that required his expertise was the ambitious Birmingham Corporation Water Bill, allowing the purchase of the Elan Valley in Wales. Martineau had been a member of the Water Department and took over from Avery as chair (1887 -1893). He successfully steered the bill through Parliament, attending the House of Commons select committee on the bill which was passed in 1892. Sadly, Martineau never saw the scheme start as he died in July 1893.

Parker, Edward Lawley (1837 – 1908)[9]

Local manufacturer, councillor, alderman, mayor

Parker was born in a rural part of Edgbaston in Birmingham, but the family moved to Hampshire. After his education at Dorchester Grammar School, he returned to the town of his birth and started work at a military ornaments business. He continued in this trade, forming the partnership of Bent and Parker. From the 1870s Parker took on public roles with the Free Hospital for Sick Children and with the council of the Birmingham and Midland Institute. In 1880 he was elected to the council for St. Stephen's ward and joined the Public Works Committee, later becoming chair. He was elected mayor in 1891, serving two consecutive terms and becoming an alderman in 1892. During his mayoralty he became involved with the Water Bill, assisting Thomas Martineau. Upon the death of Martineau, it fell to Parker to take over as chair of the Water Department (1893 – 1908) to see the Elan Valley Scheme through to its successful completion. It was reported that this task affected his health as Parker endured poor health and surgery during that period. He improved sufficiently to be present at the grand royal opening event in Wales. In recognition of his efforts, he was granted freedom of the city in 1904 and died at his home in Edgbaston in 1908.

[9] *Birmingham Daily Gazette*, 14 March 1908.

Tait, Lawson (1845 – 1899)[10]

Pioneering gynaecological surgeon and councillor.

Born in Edinburgh and educated at the university and Heriot's Hospital, Tait became in 1866 a licentiate of the Royal Colleges of Surgeons and Physicians. Tait came to Birmingham in 1870 and soon established good relationships with George Dawson and Joseph Chamberlain, joining them in 1871 at a meeting to launch a new hospital for the treatment of women's ailments. As junior surgeon, Tait went on to develop his radical surgical techniques; he was a pioneer in the field of abdominal surgery and by the 1880s he was an expert in his field. His full biography details his achievements in surgery and the associations and societies he was involved with, such as being President of the Birmingham branch of the British Medical Association and professor of gynaecology at Queen's College.

Tait soon joined the ranks of the Liberal elite that became civically involved with the town and was elected to the council for the Bordesley area in 1876. He immediately joined the new Health Committee, becoming chair, and served on the Asylums Committee. He soon put his medical training to good use and with the MOH, Dr Alfred Hill, produced a report and the first disease map of the borough in 1877. Tait was also particularly interested in waste management, producing a paper, *Utilisation of Town Refuse* (1884), detailing the mechanical and technological processes used to dispose of the privy pan and ash waste and produce 'poudrette'. Tait advocated this method as being better than disposing of waste in tips that when disturbed could contaminate the soil and cause disease.

Tait resigned from the council in April 1885 but went on to contest the Bordesley Division in the General Election of 1886 as a Liberal candidate (supporting Gladstone) but was defeated by Jesse Collings. Tait's later years were marred by poor health and professional decline and disputes. He died in 1899 at his home in Llandudno.

White, William (1820-1900)[11]

Local business owner, councillor, alderman, mayor.

Born and educated in Reading and trained in the printing trade, White and a partner purchased a bookselling business in Bull Street, Birmingham in 1848. The business gradually moved away from bookselling and turned to printing, with larger premises in Moor Street. White joined the Society of Friends and started to teach at the Quaker

[10] Full biographical entry by D'A. Power (revised by J. E. Sewell), 'Tait, (Robert) Lawson (1845-1899), *ODNB,* http://doi.org/10.1093/ref:odnb/26919 [accessed 17 June 2020].
[11] For biographical entry, see S. Pettitt, 'White, William (1820-1900), *ODNB,* http://doi.org/10.1093/ref:odnb/101113 [accessed 17 June 2020].

Severn Street Day School. White was responsible for expanding the number of Quaker Sunday schools, many following his Severn Street model. White developed the teaching of illiterate adults and introduced his students to more diverse subjects which included moral teachings on temperance and gambling.

A total abstainer, White came to the town council through the temperance movement. In 1873 he successfully sought election as the Liberal candidate for St. Mary's ward in opposition to the solicitor to the local victuallers. White joined the ranks of the reforming Liberals on the council and went on to chair committees for public works and baths and parks but, most significantly, the Improvement Committee for five years. This committee oversaw the demolition of the slum area in his ward after his reports on the social deprivation there. The scheme also saw the creation of the commercial thoroughfare of Corporation Street but due to the financial depression in 1876, the planned municipal housing that White hoped for did not materialise. He continued to campaign for more municipal housing and did achieve some modest projects. White was elected alderman in 1883 and served as mayor in 1882/3, remaining on the council until his death in 1900.

Medical Officers of Health (MOHs)

Hill, Alfred Dr (1826-1922)[12]

Borough Analyst (from 1861) and Birmingham MOH (1872-1903)

Hill was articled, at the age of 16, to his uncle, Joseph Heeley, a surgeon at Stone, Staffordshire. A medical student at Birmingham, he graduated M.D. at King's College, Aberdeen in 1854. He was chair of chemistry and later toxicology at the Sydenham College Medical School and Queen's College, Birmingham. First appointed Borough Analyst for Birmingham in 1861, he was then also appointed MOH in 1872.

Author of many papers on public health, published in *The Lancet* and *Analyst* on subjects such as water supply, polluted wells, house drainage, infant mortality and sewage farm butter and milk. His paper, *What is the relation of water supply in large towns to the health of the inhabitants?* read at the 1868 Social Science Congress in Birmingham, was instrumental in motivating an attempt to municipalise the town's waterworks company. He was also instrumental in establishing the town's isolation hospital for infectious diseases and emphasising the importance of infectious disease notification to help combat the spread. During his long career, Hill was well respected

[12] Obituary: 'Alfred Hill, M.D., Formerly Medical Officer of Health for Birmingham, *The British Medical Journal*, Vol. 1, no. 3193 (Mar 11, 1922), pp. 417-418.

in his field and was president of the Society of Public Analysts and the Society of Medical Officers of Health.

Hill was involved with the public health of Birmingham for over forty years, eventually retiring in 1903. Initially a supporter of the pan system as an alternative to the ashpit, he soon saw the problems with the system in the courtyards of the back to backs. Aware of the problems with water supply, Hill advocated a waste-water closet, but technological issues meant that it never totally replaced the pan system. Two of his sons followed him into the profession, with Dr Bostock Hill, becoming MOH for Warwickshire and Dr Eustace Hill, MOH for Durham. Hill's career spanned the period of new discoveries in medical knowledge and he accepted contagion theory early on with the effects of water-borne disease and became an avid campaigner for the closing of wells polluted by sewage. By the end of his career, germ theory was more firmly established but Hill maintained, in addition to new discoveries, the importance of the practice of hygiene for the prevention of disease. He enjoyed a long retirement, moving to the Isle of Wight and died, aged 95, on 22 February 1922.

Robertson, Sir John (1862-1936)[13]

Birmingham MOH 1903-1927

Born in Warminster, Wiltshire, he attended the University of Edinburgh and qualified MBCM in 1884. Drawn to public health he travelled abroad, studying the sanitation systems of other countries, and went on to study and gain a degree in Public Health in 1889. Robertson was first MOH and Analyst at St. Helens where his keen interest in bacteriology brought innovative measures against infectious diseases. He was then appointed MOH at Sheffield in 1897 and became Professor of Public Health and Lecturer in Bacteriology at the new university. It was while at Sheffield that he worked towards a local Act of Parliament to make notification of tuberculosis compulsory. He took the post of MOH for Birmingham after the retirement of Dr Alfred Hill in 1903 and at a time of rapid expansion continued to tackle infant mortality and instigated schemes to deal with tuberculosis before they were made compulsory by national legislation. He was also Chair of Public Health at the University of Birmingham and was knighted in 1925 for his services to the community. Robertson was actively involved in the founding of the Birmingham Heredity Society before the First World War and was for number of years Chair of the Birmingham branch of the British Social Hygiene Council (before 1925 known as The National Council for Combating Venereal Diseases). The terrible housing situation in Birmingham undoubtedly

[13] Biographical entry by S. Sturdy, Robertson, Sir John (1862-1936)', *ODNB,* http://doi.org/10.1093/ref:odnb/57203 *ODNB* entry [accessed 17 June 2020]. Supplemented with various news sources, including obituaries from the *Birmingham Post,* 18 December 1936 and the *Birmingham Mail*, 17 December 1936.

inspired his interest in slum clearance schemes and he was a passionate advocate of town planning on scientific lines. He published two books, *Housing and the Public Health* (1919) and *The House of Health: What the Modern Dwelling Needs to Be* (1925). He retired from the council on superannuation in October 1927 but continued his tenure with the university. Robertson was held in high regard by the Public Health Committee and his colleagues, with a presentation of a silver tea service and a motor car from the staff of the department. At the time of his sudden death at the age of 74 in 1936, he lived in Harborne, Birmingham.

Borough/City Surveyors

Pigott Smith, John (1798 - 1861)[14]

Surveyor to Street Commissioners (1835-1851) and Borough Surveyor (1851-1857).

Born in London, Pigott Smith served his apprenticeship as a surveyor and valuer, and for a time set up his own business and worked on projects with George and Robert Stephenson. His reputation as a surveyor was established with his trigonometrical survey maps of Brighton (1825) and Birmingham (1828). It is believed that he also spent time as a fast-coach driver between London and Birmingham which developed his interest in macadamised roads. In 1835 he was appointed surveyor to the Street Commissioners in Birmingham and oversaw the replacement of cobbled roads and pavements with the new macadam surfaces and improved drainage. This, coupled with a scheme of watering and sweeping that he arranged, meant that the streets were kept in good order. His expertise in the new road surface was sought after by other towns and by the authorities in Paris. His next major project was to improve the sewerage system of Birmingham and he oversaw the building of two sewer mains.

In 1851, when responsibility transferred to the Corporation (town council), Pigott Smith was made Borough Surveyor and had two assistants. He had further ambitious plans for the town's sewage and drainage but his time at Birmingham did not end on good terms. The costs of the planned improvements met with opposition from the Economist faction of the council when spending on municipal projects was reduced. Pigott Smith's relationship with the council, in particular the Economist-led Public Works Committee, soured to such a point that Pigott Smith was removed from his post in 1857. After threatening legal action for libel and his unfair dismissal, Pigott Smith settled out of court and received a payment of £300.

[14] Full biographical entry by P. Bounous, 'Smith, John Pigott (1798-1861)', *ODNB,* http://doi.org/10.1093/ref:odnb/105623 [accessed 17 June 2020].

Price, John (1855 – 1906)[15]

City Surveyor (1896-1906)

Born in June 1855, educated at Manchester Grammar School and Owens College, Manchester. Except for his first appointment, as an engineer on the construction of a railway, Price's career was entirely devoted to municipal work. Between 1876 and 1878 he was employed as Resident Engineer on the Barrow-in-Furness main drainage works; for the next 6 years he occupied the position of Engineer and Surveyor to the Barton Sanitary Authority; and from 1884 to 1895 he acted as Engineer and Surveyor to the Toxteth Urban District Council. In 1895, Toxteth being brought within the city boundaries of Liverpool, Price was appointed Assistant City Engineer.

In 1896 Mr. Price was appointed City Surveyor of Birmingham and his first major project was the reconstruction of the sewerage of Edgbaston and Harborne. During his tenure there was reorganisation of the department due to the size of the city and a number of major works were completed. These included the reconstruction of a section of the Rea main sewer; the improvement and diversion of the River Rea, near Calthorpe Park; extensive wood paving; the construction of underground lavatories; the extension of Corporation Street; and the construction of Small Heath Viaduct. Mr. Price was a Fellow of the Surveyors' Institution and was connected with various municipal societies. He was elected an associate member of the Institution of Civil Engineers in 1879 and a member in 1897. He died suddenly after an operation in 1906.

Stilgoe, Henry Edward (1867 – 1943)[16]

City Engineer (1906 – 1919)

Educated at Christ's College, Finchley, and following engineering training at the Crystal Palace School of Engineering, he was articled to Kirk and Parry, public works contractors. He acted as assistant engineer on the construction of the Barking and Pitsea Railway extension. He was assistant surveyor for Lewisham District Board of Works (1887-1893) and then surveyor to Sandgate Local Board, Kent. After his work on house, sewer and water mains he was appointed Borough Engineer and Surveyor and Water Engineer for Dover. In 1906 he became City Engineer of Birmingham and was responsible for large town-planning schemes. After the war in 1919 he took the position of Chief Engineer to the Metropolitan Water Board.

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[15] Information from 'John Price (1855-1906)', *Grace's Guide to British Industrial History* (2020), https://www.gracesguide.co.uk/John_Price_(1855-1906) [Accessed 11 November 2020].

[16] 'Obituary: Henry Edward Stilgoe (1867-1943)', *Journal of the Institution of Civil Engineers*, 20, 7 (1943), pp. 202-203.

Till, William Spooner (1830 – 1898)[17]

Borough/City Surveyor (1858-1896) and engineer to the Drainage Board (1877-1896).

Born in Birmingham and educated at King Edward's School. In 1846 Till was articled at the age of 16 to John Pigott Smith, surveyor to the Birmingham Street Commissioners. When Pigott Smith was made Borough Surveyor in 1852, Till was appointed assistant and succeeded Pigott Smith to the role of Borough Surveyor in 1858. Till's career spanned a period of enormous change in the town and many improvements were completed under his direction. They included street improvements; joint sewerage schemes; new tramways; the development of Corporation Street; diversion works on the River Rea and River Tame; plant for interception and destructor works; and new parks and recreation grounds. Hence, the surveyor's department expanded considerably under Till; by 1889 it was declared that there were 199 miles of public sewers and a total of 7,326 lamps.

In 1877, at the formation of the Drainage Board, the role of engineer to the Board was also added to Till's list of duties. For the Drainage Board, he oversaw the extensions of the sewage farm irrigation schemes in 1881 and 1896. In 1880 he visited Paris (with waterworks engineer John Gray) to investigate the street watering systems there. Till's entire career was in municipal engineering at Birmingham until, with failing health, he requested some relief from his duties in 1896. He was retained in the post of Consulting Engineer until his death in 1898.

Utility Engineers

Gray, John William (1828- 1896)[18]

Engineer to Birmingham Waterworks Company/Birmingham Council Water Department

Born in October 1828 at Montrose, where his father carried on business as a general merchant, ship-owner, and flax spinner. He received his early education in his native town, and then at Dr. Cowen's school at Bishop Wearmouth. During his boyhood he took great interest in the flax-spinning mill, which his father started at Balbirnie, near

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[17] 'Obituary: Willam Spooner Till (1830-1898)', *Proceedings of the Institute of Civil Engineers,* Vol. 132 (1898), pp. 388-390; *Birmingham Faces and Places,* Vol. II, No.7 (1889).

[18] From 'John William Gray (1828-1896)', *Grace's Guide to British Industrial History* (2020) https://www.gracesguide.co.uk/John_William_Gray> [Accessed 11 June 2020]; see also, City of Birmingham Water Department, *History of Birmingham Water Department* (Birmingham, 1974). After his father, William Gray had a career of 47 years' service with Birmingham Water Department.

Montrose, and at which he learnt to turn both wood and iron in the lathe, and to understand the working of the machinery. He was articled to Mr John Murray, engineer to the River Wear Commissioners working on the improvements of the river and harbour and on the preparation of marine surveys for the proposed south docks at Sunderland. He then moved to London and for a number of years was employed by other engineers for projects for the New River Company and East London Water Company and also in Russia.

In 1866, after a spell working for himself, he was appointed engineer to the Birmingham Waterworks Company and his first work was to carry out various extensions. He remained as chief engineer after the waterworks were taken over by the Birmingham Corporation in 1876 – the same year that he became a member of the Institution of Civil Engineers. He remained with the corporation for the rest of his career, well-respected for his engineering expertise. In 1880, on behalf of the corporation he visited Paris (with surveyor W. S. Till) to investigate and report back on the water and sewage departments in that city.

The continued growth of Birmingham meant that other sources of water supply were required, and he strongly supported the Elan Valley Scheme. In July 1894 due to failing health he retired after twenty-nine years' connection with the waterworks, although he continued to consult up to his death. His son **William Gray** took over as Distribution Engineer 1894 -1905 for the City of Birmingham Water Department and then as Local Engineer 1905 -1927 (there was a separate post for the Elan supply).

Watson, John Duncan (1860 – 1946)[19]

Engineer to BTRDDB (1899-1923)

Born in Dundee and educated at Dundee High School. Watson trained and acted as assistant to James Watson M.I.C.E., a waterworks engineer, to the city of Bradford. In 1884, Watson became Borough Surveyor to Arbroath council before taking on the role of County Engineer for Aberdeen in 1890. From 1899 until his retirement in 1923, he was engineer to the Birmingham Tame and Rea District Drainage Board where he was a pioneer in the development of sewage purification. He was responsible for the construction of the first large percolating filter plant and experimented with separate sludge digestion and utilisation of methane for power production in gas engines. Respected in his field, he delivered many papers and lectures at various engineering

[19] Obituary from *Proceedings of the Institution of Civil Engineers* (1946); 'John Duncan Watson (1860-1946)', *Grace's Guide to British Industrial History* (2020) https://www.gracesguide.co.uk/John_Duncan_Watson [accessed 22 June 2020].

and sanitary institutions and published *The Works of the Birmingham Tame & Rea District Drainage Board* (1912), detailing the works of the percolating plant.

Upon retirement from the Drainage Board, he joined with his son, David M. Watson, to form the company J. D. and D. M. Watson, consultant engineers. Watson held various positions throughout his career, such as President of the Association of Students of the Institution of Civil Engineers, 1905 and 1906; President of the Association of Managers of Sewage Disposal Works, 1911-1912; President of the Institute of Sanitary Engineers, 1914; President of the Birmingham and District Association of the Institution of Civil Engineers, 1921; President of the Institution of Civil Engineers, 1935-36; Vice-President of the Royal Sanitary Institute; and Chairman of the Association of Consulting Engineers, 1934-35.

Inspector of Nuisances (ION)

There is little personal biographical information to be found about the city's IONs, indicative of their lower status in comparison with other offices of the council. Examination of newspapers and council records has allowed the production of a chronological list of those employed in this role, supplemented with other information about duties and pay.

Bliss, James

An exact date of appointment has not been identified but it was possibly in 1847 after the Nuisances Removal Act 1846 (although this is not listed in the chronology in the council histories). Bliss is listed as ION for the Municipal Council in Rawlinson's 1849 Report. The establishment of the Borough Inspection Committee after the Birmingham Improvement Act of 1851 made permanent the requirement for an ION (sometimes referred to as Chief Inspector). Bliss's salary rose from £175.00 to £200 per annum in 1863. In 1865 Bliss's career ended in disgrace, as along with another inspector in the department, he faced charges of extortion and fraud. The situation resulted in Bliss committing suicide.

Woolley, Robert

Woolley was officially appointed ION in 1865, after the death of former Chief Inspector James Bliss. He was already employed as an inspector by the council but had worked previously for the police department. Woolley was in post at the precise point of key changes in the town; administratively, politically and in terms of sanitary

reform. The Public Health Acts of 1872 and 1875 brought extra duties and saw the Borough Inspection Committee evolve into the Sanitary Committee (as an Urban Sanitary Authority) then to the Health Committee in 1876. In 1874 Woolley was asked by Avery and the sewage committee to oversee the nightsoil department and interception and his salary was increased from £225.00 to £275.00 to cover his extra duties. This suggests that Woolley was respected by councillors and he also had a good working relationship with the MOH, Dr Alfred Hill, with whom he was familiar through Hill's earlier appointment as Analyst. Woolley died in 1878 while in post.

Booker, Frederick

Booker was appointed in 1878 after the sudden death of Woolley. However, due to the expansion of the pan system at this time, his role reverted to being solely that of ION at a salary of £250.00 per annum. A new post of Superintendent of Nightsoil and Interception was established (with William Cale appointed in this role). Booker resigned in November 1880 due to ill health.

Dale, Thomas H. was appointed in February 1881. *Birmingham Daily Post* (2 February 1881) reveals that after Booker resigned at a rate of £250.00 per annum, the committee agreed to advertise the ION role at a rate of £350.00 per annum to attract good quality candidates. The council received 170 applications and after interview appointed Dale. However, Dale had previously been an inspector at Hull at a salary of £175.00 per annum so was offered Booker's rate of £250.00 and he accepted. [The ION role at Birmingham never did achieve the £350.00 per annum].

Parker, John

Parker was appointed ION in March 1885 and resigned in 1904 after 22 years' service with the council. In addition to the title of ION he was also appointed Officer to procure samples of foods and drugs and appointed an Examining Officer under the Canal Boats Act 1877.

Thompson, Frank

Appointed to the new Chief Inspector role after a departmental re-organisation under new MOH, Dr John Robertson. The role of Assistant MOH was introduced, taking over some duties that were formerly within the remit of the ION. This included prevention of infection, supervision of disinfecting staff and inspectors of milkshops, canal boats and lodging houses.

The 'status' of Inspector of Nusiances (which still carried statutory powers under Acts of Parliament) was given to the Chief Inspector who had the direction of district inspectors, smoke inspectors, and court-cleansers and of male inspectors appointed under the Factory and Workshops Act. A lady inspector was appointed under the same act to visit female outworkers and inspect the sanitation of workshops where females were employed.

Superintendent of Health Visitors

Blanche Gardiner (1869 -1953)[20]

Superintendent (1910-1928/29)

The 1901 census shows that Gardiner was living with her parents and siblings in Leicester. From a comfortable middle-class family (her father owned a cotton dying business), Gardiner was well educated and attained a degree. By September 1904 she had left her family and was engaged as a temporary sanitary inspector for the prevention of infant mortality at St Pancras; this role became permanent in 1905 when she was the second female sanitary inspector to be employed by St Pancras Public Health Committee.

In 1910 she applied for the post of Superintendent of Health Visitors at Birmingham. Gardiner's qualifications included the Sanitary Institute for Sanitary Inspection, a degree from Bedford College in hygiene, physiology, bacteriology, chemistry and physics, St John's Ambulance First Aid and Nursing and a certificate of three months' training in midwifery. She had supervisory experience through her organisation and supervision of the voluntary health visitors at St Pancras. Gardiner was also on the executive committee of the St Pancras school for mothers. She had lectured on hygiene and physiology in different towns and read papers at several congresses of the Sanitary Institute. Her papers reveal her as a campaigner for gender equality, pay and holiday entitlement. Gardiner was a fully qualified sanitary inspector, like her male counterparts, and had been engaged as a female sanitary inspector at St Pancras – specifically for the prevention of infant mortality which evolved into the role of health visitor.

[20] [This biographical information was compiled from census returns, newspaper archives and papers delivered at Sanitary Institute congresses.] In the *History of the Corporation of Birmingham, Vol. V* which covers the period 1915-1935, in the section on public health 'Personnel', only the retirement of MOH, Sir John Robertson and the appointment of his successor, Dr H. P. Newsholme is referred to. There is no mention or recognition of Blanche Gardiner's retirement or indeed any change of personnel in the chief inspector role. J. T. Jones, *History of the Corporation of Birmingham, Vol. V (1915-1935) Part I* (Birmingham, 1940), p. 217.

Gardiner began her supervisor career at Birmingham on a salary of £150.00 plus uniform and the 1911 census revealed Gardiner (aged 42) as a boarder in Moseley. She was an active campaigner and speaker, and the first provincial centre of the Women Sanitary Inspectors' and Health Visitors' Association was established in 1912 in Birmingham. Gardiner became Vice-President of this association (listed as such in 1921).

Gardiner continued to live in Harborne, Birmingham, after her retirement (between 1928 and 1929) and she died on 7 April 1953. Sadly, the MOH Annual Reports of the third MOH, make no mention of Gardiner's retirement or career. The 1930 report states that child welfare services were reorganised early in 1929 which suggests that this was the point when Gardiner was no longer in post).[21]

[21] [Report 1929] and [Report 1930]/ Medical Officer of Health, Birmingham. Source: Wellcome Collection.

Appendix 2

Estimate of Expenditure & Income for the Year 1870

Improvement Account - Expenditure[1]		
Salaries & Office Servants	1500.00	1,500.00
Repairing Streets, Men, Horses, Carts etc.	4664.00	
Rowley Rag Stone & break of 40000 tons @ 5/	10000.00	
Gravel nuts & pebbles	2000.00	
Material for repairing the present paved footpaths, flagging & guttering and paving footpaths	12000.00	
Street Plates, House numbers, Fixing & painting	200.00	
Expenses of private drainage	1350.00	30,214.00
Cleansing of streets (Men, horses & carts)	9325.00	9,325.00
Watering of streets (Men, horses & carts)	2332.00	
Water for streets	1100.00	3,432.00
Removing Nightsoil	12000.00	12,000.00
Outlay and repairs on stock, repairing box carts, night-soil carts and barrows, water carts, picks, shovels etc. £750, 12 Horses £500, repairing harness £135, Miscellaneous £200 Painting stables £50, 4 new water carts £140		
4 sets of harness £30, road sweeper £15	1820.00	1,820.00
Stationery & advertising	200.00	200.00
Rent, rates, Water, gas, coal for offices & yards	1400.00	1400.00
Bordesley Wharf, water, gas, wages	75.00	75.00
Petty expenses	1000.00	1000.00
Lighting Public Lamps	10025.00	10,025.00
Total		**70,991.00**

Income

[1] Transcribed from Birmingham Archives and Collections, Birmingham City Council Collection, BCC1/AO/1/1/7, Public Works Committee Minutes 1866-1870.

Night-soil Department	5000.00	
Bordesley Wharf Receipts	40.00	
Repayment of Improvement		
Expenses, including sale of		
Manure £600.00	2200.00	
Iron door or Flap Rents	100.00	
Sale of horses	75.00	7,415.00
Net Estimate of Expenditure		**£63,576.00**

Appendix 3

Number of Deaths and Death Rates for Birmingham 1871-1921

The table below has been compiled from a variety of sources listed at the end. It is followed by images of two pages from John Robertson's 1921 Medical Officer of Health (MOH) report offering useful statistics and comparisons on death rates for Birmingham and individual wards up to 1921.

Year	Population	No. of Deaths	Death Rate Birmingham	Average Death Rate 20 large towns
1867	324,703	8,318	25.60	
1868	329,474	8,548	25.90	
1869	334,245	7,737	23.10	
1870	339,016	7,805	23.00	
1871	**343,787**	8,594	24.90	26.90
1872	349,457	8,048	23.10	24.30
1873	355,157	8,990	24.80	24.40
1874	360,857	9,665	26.80	25.40
1875	366,557	9,668	26.30	25.40
1876	372,257	8,330	22.40	23.60
1877	377,957	9,038	23.90	22.80
1878	383,657	9,662	25.20	24.40
1879	389,357	8,650	21.80	23.20
1880	395,057	8,088	20.50	22.60
1881	**400,774**	7,938	19.70	21.70
1882	408,532	8,425	20.60	22.60
1883	414,856	8,714	21.00	21.70
1884	421,258	9,043	21.10	21.40
1885		8,156	*19.80	20.80
1886		8,499	20.50	21.30
1887		8,536	20.40	21.30
1888		7,835	18.60	19.80
1889		8,352	19.70	19.80
1890		9,561	22.00	22.20
1891	**478,113**	9,317	21.70	22.30
1892		9,642	20.00	
1893		10,445	21.50	
1894		8,946	18.20	
1895		9,863	19.90	

Year	Population	No. of Deaths	Death Rate Birmingham	Average Death Rate 20 large towns
1896		10,405	20.40	
1897		10,668	21.10	
1898		9,936	19.50	
1899		10,524	20.50	
1900		10,882	21.00	
1901	**522,204**	10,402	20.00	
1902		9,672	18.20	
1903		9,123	17.50	
1904		10,340	19.80	
1905		8,718	16.70	
1906		9,172	17.50	
1907		8,879	17.00	
1908		8,992	16.90	
1909		8,691	16.60	
1910		7,777	14.80	
1911	**~840,202**	8,892	17.00	
1916			13.50	#14.40
1917			12.60	14.40
1918		13,175	15.20	17.60
1919		12,000	13.00	13.80
1920		11,409	12.60	12.40
1921	**919,444**	10,361	11.30	12.10

Notes:[1]

*1885-1891 death rates are corrected versions as per C. A. Vince, *History of Corporation of Birmingham, Vol III* (Birmingham, 1902), pp. 124, 127.
~Figure is for area of extended boundaries in 1911 in comparison to figure for area as at 1909 boundaries.
#Average death rates 1916-1921 are for England and Wales as per MOH Report 1921.

[1] Above statistics compiled from J. T. Bunce, *History of the Corporation of Birmingham, Vol. II* (Birmingham, 1885), pp. 110; C. A. Vince, *History of the Corporation of Birmingham, Vol. III* (Birmingham, 1902), pp. 124,127; C. A. Vince, *History of the Corporation of Birmingham, Vol. IV* (Birmingham, 1923), pp. 151; W. B. Stephens, 'The Growth of the City', *A History of the County of Warwick, Vol. 7, The City of Birmingham* (London, 1964), pp. 4-25 available at: http://www.british-history.ac.uk/vch/warks/vol7/pp4-25 [Accessed 9 February 2019]; [Report 1921] / Medical Officer of Health, Birmingham. Source: Wellcome Collection; '1921 census of England and Wales', *A Vision of Britain Through Time* (2023) https://www.visionofbritain.org.uk/census/table/EW1921GEN_M13 [accessed 20 January 2024].

NOTIFICATION OF BIRTHS ACT.

There were 21,484 births notified, out of a total of 22,134, that is to say, 97 per cent. of all the births were notified so early as to enable the Visitors to give advice when this was necessary and thus prevent in many cases the weaning of the infant when this was not required.

STILLBIRTHS.

There were 804 stillbirths reported, against 911 in the previous year. In each of these cases inquiry was made as to the probable cause.

DEATHS.

The deaths of 10,361 persons were registered during 1921, being 5,523 males and 4,838 females. In 1920 there were 11,409 deaths, in 1919 12,000, and in 1918 13,175.

DEATH-RATE.

The death-rate for 1921 was 11·3 per 1,000. As will be seen from the following table this death-rate was the lowest ever registered in Birmingham. It was lower than that in England and Wales and in many of the other great towns.

DEATH-RATES PER 1,000 IN BIRMINGHAM, 1871 TO 1921.

	Birmingham.	England and Wales.
1871-1875 (Old City)	25·2	22·0
1876-1880 ,, ...	22·8	20·8
1881-1885 ,, ...	20·7	19·4
1886-1890 ,, ...	20·2	18·9
1891-1895 ,, ...	20·3	18·7
1896-1900 ,, ...	20·5	17·7
1901-1905 (Present Area) ...	16·5	16·0
1906-1910 ,, ...	15·0	14·7
1911-1915 ,, ...	14·6	14·3
1916 ,, ...	13·5	14·¼
1917 ,, ...	12·6	14·4
1918 ,, ...	15·2	17·6
1919 ,, ...	13·0	13·8
1920 ,, ...	12·6	12·4
1921 ,, ...	11·3	12·1

COMPARATIVE DEATH-RATES IN EIGHT LARGEST TOWNS.

(*From Registrar-General's Figures.*)

Glasgow	15·1 per 1,000
Birmingham	11·2 ,,
Liverpool	14·3 ,,
Manchester	13·6 ,,
Sheffield	12·5 ,,
Leeds	13·5 ,,
Bristol	11·0 ,,
Edinburgh	14·4 ,,

The year 1921 was characterised by three outstanding features from a health point of view:—(1) Extreme depression in trade and consequent unemployment and poverty; (2) extremely bad housing conditions for a certain proportion of the people; and (3) a long warm dry summer, which in former years would have proved inimical to infant life. Notwithstanding the unfavourable conditions, the death-rate was the lowest ever recorded.

WARD BIRTH AND DEATH-RATES IN 1921.

The next table gives the figures of population, birth-rates and death-rates in wards:—

Figure 1: *[Report 1921] / Medical Officer of Health, Birmingham*. Source: Wellcome Collection. Attribution 4.0 International (CC BY 4.0)

	Ward.	Approximate Population.	Birth-Rate.	Death-Rate.
Central Wards ...	St. Paul's	31,600	31·8	14·7
	St. Mary's	33,500	35·7	17·4
	Duddeston and Nechells ...	45,100	32·9	13·7
	St. Bartholomew's	39,800	32·3	14·2
	St. Martin's and Deritend ...	44,900	30·8	13·6
	Market Hall	18,600	28·0	14·6
	Ladywood	30,200	30·8	12·6
Middle Ring ...	Lozells	34,500	21·8	11·7
	Aston	42,300	28·7	12·1
	Washwood Heath	36,900	23·8	10·9
	Saltley	30,600	23·9	9·2
	Small Heath	31,000	20·5	10·5
	Sparkbrook	36,700	23·8	10·2
	Balsall Heath	39,900	22·5	11·4
	Edgbaston	35,100	15·2	10·7
	Rotton Park	41,600	24·8	11·2
	All Saints'	43,800	25·0	11·3
Outer Ring ...	Soho	28,000	20·1	10·1
	Sandwell	19,500	16·4	11·3
	Handsworth	27,700	17·7	10·1
	Erdington North	18,100	21·1	9·3
	Erdington South	19,200	20·0	10·2
	Yardley	17,100	20·5	8·0
	Acock's Green	29,900	21·0	8·3
	Sparkhill	24,900	19·3	9·1
	Moseley and King's Heath ...	29,100	14·8	10·5
	Selly Oak	29,000	20·8	7·6
	King's Norton	22,100	18·0	7·8
	Northfield	8,400	19·6	8·7
	Harborne	16,500	20·2	8·2

The highest ward death-rate was that in St. Mary's Ward of 17·4 per 1,000. The next highest were in St. Paul's and Market Mall Wards, viz., 14·7 and 14·6, respectively.

During the last ten years all the less healthy wards have shown a substantial improvement, so that the death-rates in them are gradually growing nearer to those of the more healthy areas. There is still, however, far too high a mortality in the central areas, due largely to the bad housing conditions existing there. The relative death-rate in each of the wards is shown in the appended table.

	Ward.	Mean Death-Rate, 1912-1916.	Death-Rate, 1917-1921.	Increase or Decrease.
Central Wards ...	St. Paul's	20·5	17·3	–3·2
	St. Mary's	24·5	19·6	–4·9
	Duddeston and Nechells ...	20·6	16·5	–4·1
	St. Bartholomew's	20·6	17·0	–3·6
	St. Martin's and Deritend ...	20·6	17·5	–3·1
	Market Hall	17·8	15·5	–2·3
	Ladywood	17·1	16·0	–1·1
Middle Ring ...	Lozells	13·4	13·0	–0·4
	Aston	15·2	13·3	–1·9
	Washwood Heath	12·7	11·3	–1·4
	Saltley	12·2	11·1	–1·1
	Small Heath	11·5	11·7	+0·2
	Sparkbrook	12·8	12·3	–0·5
	Balsall Heath	12·7	13·1	+0·4
	Edgbaston	11·8	12·0	+0·2
	Rotton Park	14·9	13·3	–1·6
	All Saints'	14·6	13·0	–1·6

Figure 2: *[Report 1921] / Medical Officer of Health, Birmingham*. Source: Wellcome Collection. Attribution 4.0 International (CC BY 4.0)

Appendix 4

A Summary of Recommendations from Sewage Inquiry Committee[1]

The gradual abolition of middens and substitution of a new privy system, based upon the principle of exclusion from the sewers, and weekly collection of all excrementitious matter, solid and liquid.

1. A system, to be developed in connection with the above, of exclusion from the sewers and collection of refuse from slaughterhouses, cattle markets, urinals, cow-houses, and stables.
2. An experimental trial of the Rochdale and Manchester systems, on a sufficiently large scale, and under the strictest supervision; and ultimately an extension to the whole town of that system which shall be found to be the most efficient.
3. The imposition of a rate on occupiers, in respect of water-closets connected to the sewers, on a scale sanctioned by the Council.
4. That a register be prepared and kept of all connections with the sewers, and that no future connections with the sewers should be made without the consent of the Council.
5. The exclusion from the sewers of the refuse from the works of German silver manufacturers, galvanisers, wire drawers, and all manufacturing chemists and from other such works the refuse from which may, from time to time, be found to interfere with the utilisation of the sewage of the borough, unless such refuse shall, previously to be discharge into the sewers, have been so treated as to not to interfere with such utilisation.
6. The purchase of 800 acres of land for the purposes mentioned in this report.
7. To obtain borrowing powers for the purchase of land execution of the necessary works.
8. To obtain powers for creating Perpetual Annuities for such sums as may be actually expended upon the purchase of land, and for distributing the repayment over 75 years of such sums as may be expended upon the construction of a conduit or other necessary permanent structural works.
9. To obtain powers for leasing land and entering into agreements for supplying sewage to owners and occupiers of land.
10. That in case the Council adopt in substance the recommendations now submitted, and instruct this Committee to carry the same into effect, the Committee to be called “The Sanitary and Sewage Committee” and be empowered to prepare for approval by the Council the necessary measures to be submitted to Parliament and the Local Government Board, and cause the usual Parliamentary and other notices to be given, under the advice of the Town Clerk; such Committee to have the management and control of the sewers, sewage and sewage farm.

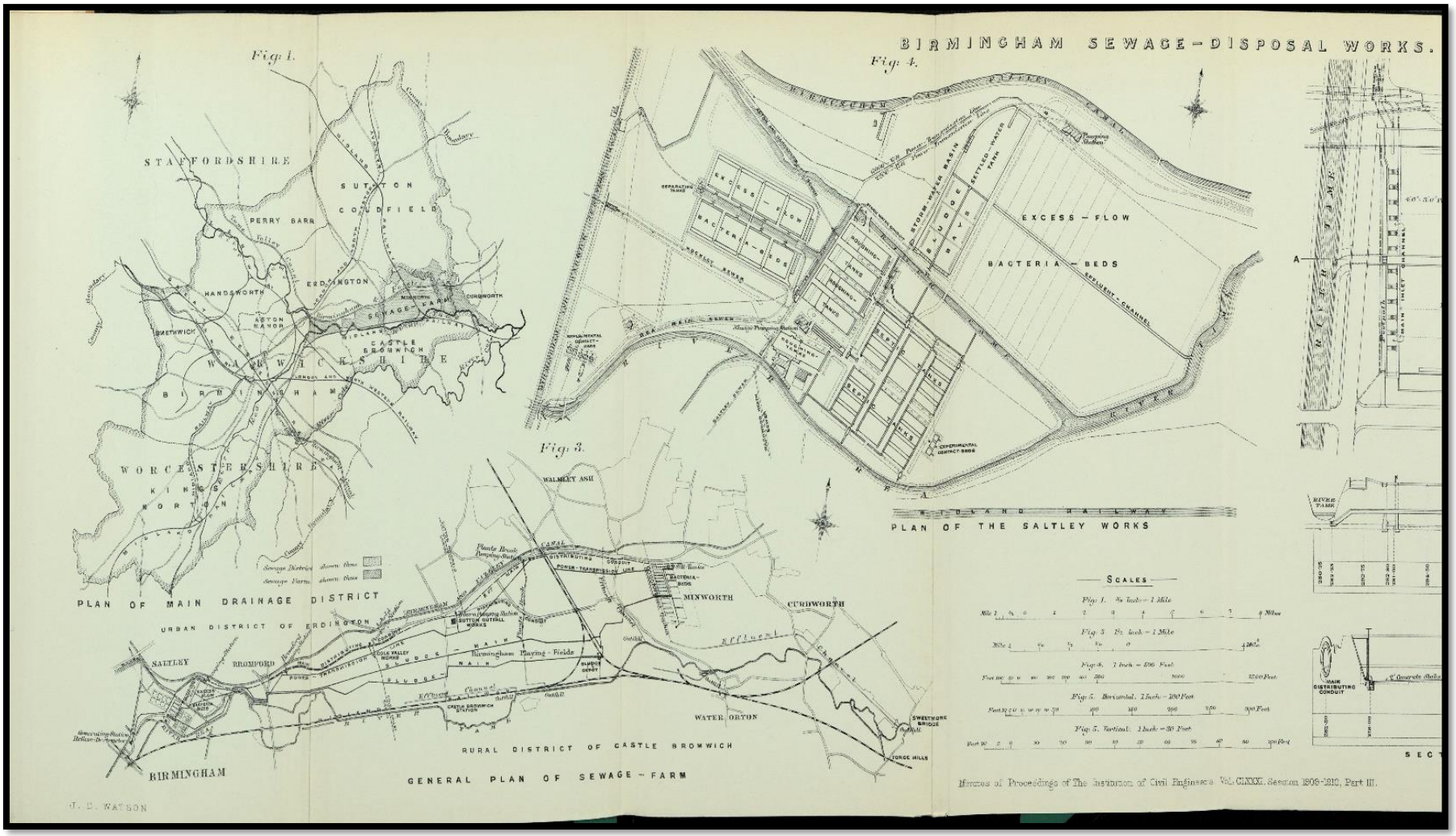
(Signed) THOMAS AVERY Chairman
HENRY HAWKES
ALFRED BARRATT, M.D.
JESSE COLLINGS
Wm. HARRIS
JOHN LOWE
EDMUND TONKS, B.C.L.
G. S. Mathews, M.A., (Secretary)

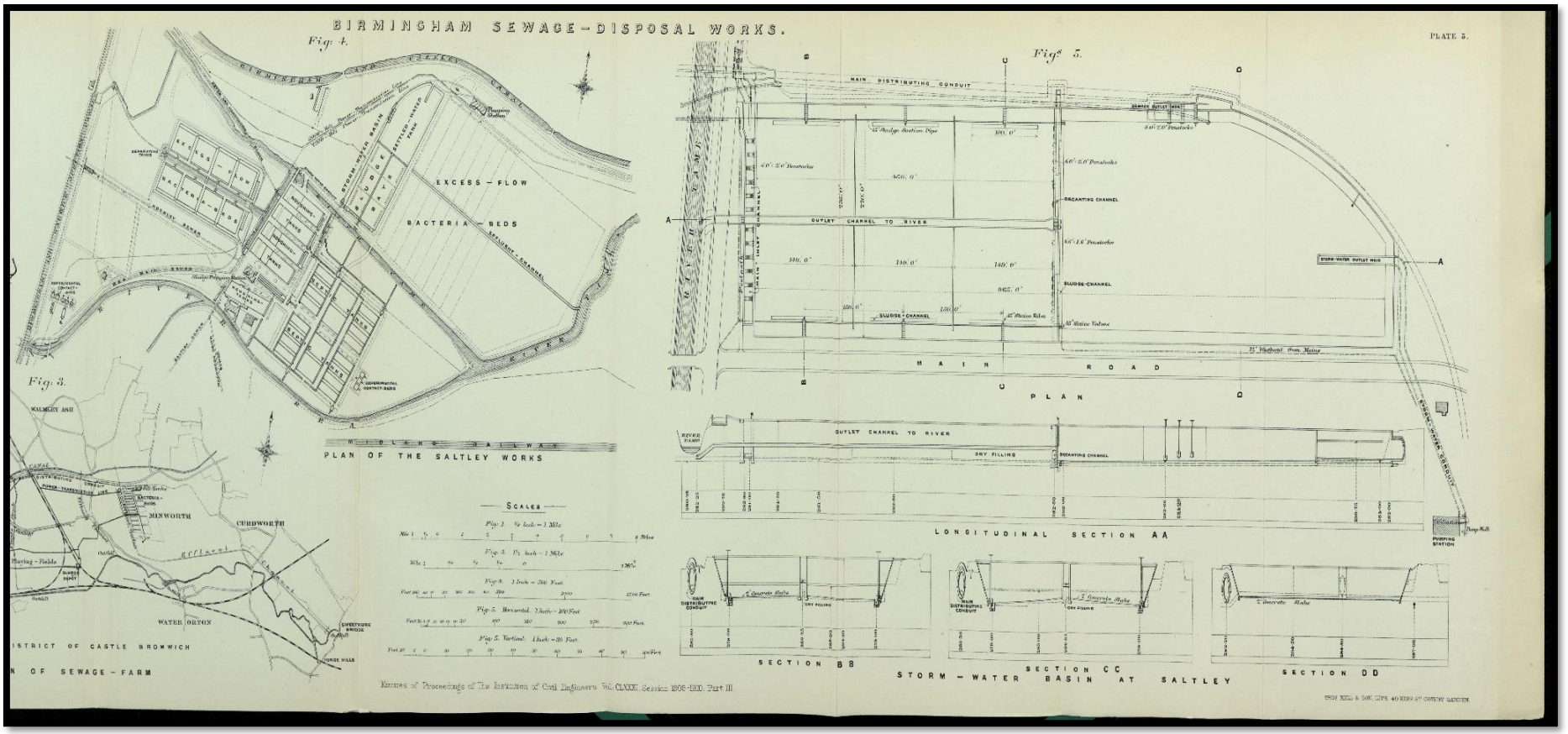
[1] Transcribed from BAC, L.45.4.2107, Bound Copy of *Report of the Sewage Inquiry Committee* (Birmingham, 1871), pp. 99-100.

Appendix 5

A Plan of Birmingham Sewage Disposal works in 1910.

Taken from J. D. Watson, 'Birmingham Sewage-Disposal Works. (Including Appendix and Plates at Back of Volume)', *Minutes of the Proceedings of the Institution of Civil Engineers*, 181 (1910), pp. 259-316, Due to the size it has been digitally scanned in two parts and follows on the next two pages. Images courtesy of and with permission to reproduce, by ICE Library and Archive, London.


BIRMINGHAM SEWAGE-DISPOSAL WORKS.
Fig. 1.
STAFFORDSHIRE
SUTTON COLDFIELD
PERRY BARR
HANDSWORTH
ERDINGTON
ASTON MANOR
SMETHWICK
CASTLE BROMWICH
WARWICKSHIRE
BIRMINGHAM
WORCESTERSHIRE
KINGS NORTON
PLAN OF MAIN DRAINAGE DISTRICT
URBAN DISTRICT OF ERDINGTON
SALTLEY
BROMFORD
BIRMINGHAM
RURAL DISTRICT OF CASTLE BROMWICH
Fig. 3.
WALMLEY ASH
MINWORTH
CURDWORTH
WATER ORTON
SWETHMORE BRIDGE
FORGE MILLS
GENERAL PLAN OF SEWAGE-FARM
Fig. 4.
EXCESS-FLOW
BACTERIA-BEDS
PLAN OF THE SALTLEY WORKS
SCALES
Fig. 1. 2 Inches = 1 Mile
Fig. 3. 8 Inch = 1 Mile
Fig. 4. 1 Inch = 400 Feet
Fig. 5. Horizontal. 1 Inch = 100 Feet
Fig. 5. Vertical. 1 Inch = 50 Feet
SECT
Minutes of Proceedings of The Institution of Civil Engineers Vol. CLXXXI. Session 1909-1910, Part III.
J. D. WATSON


BIRMINGHAM SEWAGE-DISPOSAL WORKS.
PLATE 5.
Fig. 4.
EXCESS-FLOW
BACTERIA-BEDS
EFFLUENT CHANNEL
PLAN OF THE SALTLEY WORKS
Fig. 3.
MINWORTH
CURDWORTH
WATER ORTON
Scales
Fig. 5.
MAIN DISTRIBUTING CONDUIT
OUTLET CHANNEL TO RIVER
DECANTING CHANNEL
SLUDGE-CHANNEL
MAIN ROAD
PLAN
LONGITUDINAL SECTION AA
SECTION BB
SECTION CC
SECTION DD
STORM-WATER BASIN AT SALTLEY

Appendix 6

Chronological Record of Principal Events in the Private and Municipal Birmingham Waterworks[1]

1826 The Company of Proprietors of the Birmingham Waterworks constituted by Act of Parliament.

1831 Supply commenced (17 August).

1853 Constant supply provided.

1854 Company's second Act of Parliament increasing the capital.

1855 Company's third Act increasing capital and authorising new sources.

1866 Company's fourth Act authorising Plant's Brook Works, several wells, extending area of supply and restricting use of the river Tame.

1870 Company's final Act extending area and authorising use of rivers Bourne and Blythe and Whitacre Works.

1871 Robert Rawlinson reported to the Corporation on Mid Wales as a future source of supply.

1875 Birmingham Corporation Water Act authorised purchase of Company's undertaking.

1876 Water undertaking acquired by the Corporation.

1879 Birmingham Corporation Water Act extending time for construction of Whitacre Works and conferring general powers.

1883 Birmingham Corporation (Consolidation) Act received Royal Assent.

1883 Whitacre Works inaugurated by Alderman T. Avery, Chairman of the Water Committee.

1891 James Mansergh recommended acquisition of gathering grounds of Elan and Claerwen.

1892 Birmingham Corporation Water Act authorising the Elan Supply Scheme received Royal Assent.

1896 Birmingham Corporation Water Act authorised deviations of the aqueduct and construction of a short line of railway at Frankley and gave additional powers for acquisition of lands for spoil.

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[1] Transcribed from City of Birmingham Water Department, *History of the City of Birmingham Water Department* (Birmingham, 1974), pp. 26-27; CRLSC, rTD264.B5, E. A. Lees, *City of Birmingham Water Department, Elan Supply* (Birmingham, 1908), p. 3.

1902 Birmingham Corporation Water Act authorised an extension of time for construction of works and a limited capitalisation of interest and a postponement of the commencement of the sinking fund (but without deferring the ultimate date of repayment).

1904 King Edward VII inaugurated the Elan Supply Works.

1905 Birmingham Corporation Act, Part IV authorised the utilisation of compensation water for the purpose of generating power or light**.**

1907 Birmingham Corporation Act authorised a further postponement of the sinking fund (without deferring the ultimate date of repayment).

1908 Supply to Coventry from Whitacre commenced.

Appendix 7

Sources of Supply and Infrastructure of Birmingham Waterworks Company in 1875.

Reservoir/Well/Stream	Contents or Supply (Millions of Gallons)	Notes
Aston (old)	30.0	Original artificial reservoir constructed in 1827 when the sole source of supply was the river Tame and site of Aston Pumping Station. In 1875 it received water, as required, from all sources of supply before being pumped into the town for distribution.
Aston New	21.0	Constructed in 1869 additional capacity for supply for when Aston Well was sunk and as the old reservoir received water from all sources of supply.
Witton Lower	35.0	See below.
Witton Middle and Upper	47.5	A double reservoir about ¾ of a mile west of Erdington, constructed on the site of two old mill pools. They were fed by Hawthorn Brook (a stream rising between Old and New Oscott). From there the water was conveyed via an open channel following the course of the Old Hawthorn Brook to the lower reservoir and then by cast-iron pipes into the Aston reservoirs.
Perry	13.0	This was situated near Perry Barr Church and fed by a stream called Barr Brook, on the enlarged site of an old mill pool. The water from this reservoir was conveyed by 20” cast-iron pipes by the side of the Tame Valley Canal to the Aston reservoirs.
Plant’s Brook Upper	2.5	Both Upper and Lower reservoirs were the old mill pools (originally Websters forge) situated on the stream which flows underneath Lichfield Road. Water from here delivered by mains to Aston. In 1875 there were 2 filter beds under construction.
Plant’s Brook Lower	8.0	See above
Whitacre, Blythe (and filter beds)	30.0	Fed by the river Blythe. This works was situated close to Whitacre Junction station on the Midland railway. Water was pumped to raise water from the reservoir to the filter beds then the filtered water

		pumped through a main to Plant's Brook where it joined the main to Aston.
Edgbaston Upper	5.75	This was high level storage and supply reservoir at top of Hagley Road near junction of Bear Lane. Water was pumped here from the lower reservoir for the supply of the higher districts.
Edgbaston Lower	4.25	This was Monument Lane reservoir entirely for storage and water pumped to Upper reservoir.
Under construction/planned in 1875	**Contents or Supply (Millions of Gallons)**	**Notes**
Erdington	11.5	In 1875 this was under construction and intended to supply the lower part of Birmingham, Aston and Erdington. Situated on land adjacent to Lucock's Lane and at top of the hill by the new Workhouse at Erdington.
Whitacre, Bourne	400.0	The company had powers which they intended to use to make a large reservoir on the river Bourne, between Whitacre and Shustoke. The land was purchased and water rights.
Plant's Brook	20.0	In 1875 there was the intention to construct an additional reservoir with a main to Aston, through Nechells and Duddeston.
WELLS	**Calculated Yield Expected per day (million gallons)**	**Notes**
Aston	3.5	Situated near to where Sutton and Birmingham Railway crossed the Tame Valley Canal. A single action beam engine was erected in 1868. By 1875 there were two wells.
Perry	2.0	Situated between the river Tame and Tame Valley Canal near Holford Mill. Engine manufactured by J. Watt & Co. in 1870. Water from this well was pumped into the 20" main which conveyed water from Perry Reservoir to Aston.
King's Vale	0.3	Situated near Kingstanding between Old and New Oscott Colleges. Water conveyed by pipe to the Upper Witton reservoir (with plans to extend pipe to Erdington reservoir).
Witton (Short Heath)	2.5	Situated at the top of Upper Witton reservoir, near the Golden Cross at Short Heath. Yield had been tested to 2.5 million gallons per day. Water planned to be delivered to Erdington reservoir when completed.

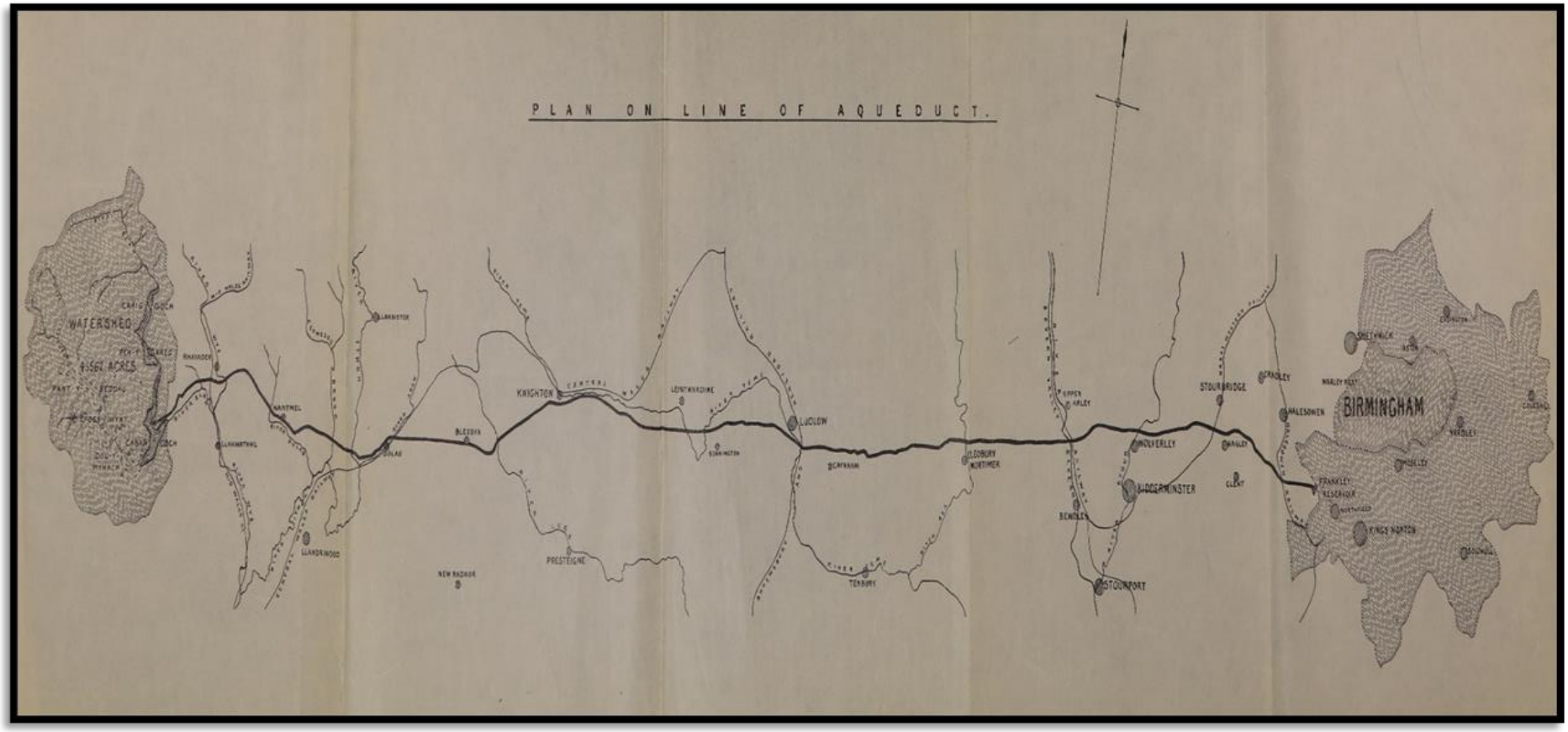
Under construction in 1875	Contents or Supply (Millions of Gallons)	
Selly Oak	2.0	Situated near where canal and railway cross the Bromsgrove and Birmingham Turnpike Road. Estimated to supply 2 million gallons per day to be delivered to the Upper Edgbaston Reservoir.

Notes:

1) Rivers and streams sources of supply included: rivers Blythe and Bourne and the river Tame (for non-domestic purposes), Plant's Brook, Witton Brook and Perry Brook.
2) In 1875 there was total length of 266 miles of water mains in the area of supply and the work of raising and pumping the water into the distribution system was carried out by 16 engines served by 40 boilers. The town and district for the purposes of supply was divided into three districts: upper, middle and lower.
3) Information compiled from BAC, Bham Institutions/D/9/72231, *A Short History of Birmingham Waterworks Company* (Birmingham, 1875).

Appendix 8

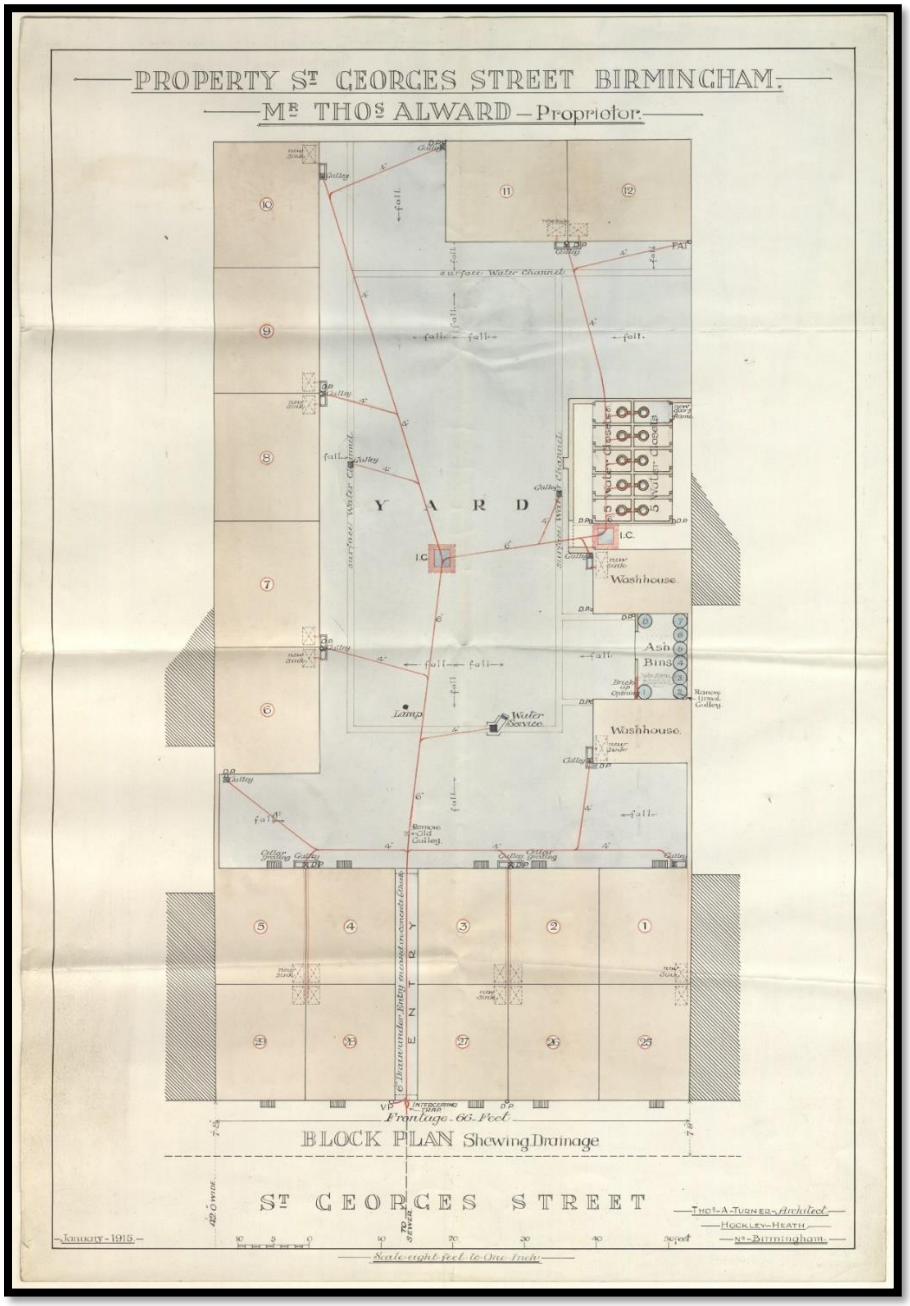
A Plan Showing the Watershed and the Path of the Aqueduct to Birmingham.



Taken from E. A. Lees, *City of Birmingham Water Department, Elan Supply* (Birmingham, 1908), rTD264.B5. Cadbury Research Library Special Collections.

Appendix 9

Block Plan 1915 of Property at St. George's Street, Birmingham.[1]



[1] BAC, BCC/1/AM/D/1/3/1/542, this block plan dated 1915 was found amongst Birmingham City Council Town Clerk's Deeds bundles. It shows houses at 25-29 St Georges Street and houses numbered 1 – 9, including ash bins, washhouses and drainage. Gratitude to archivists for highlighting existence of this plan to author. Reproduced with permission of Library of Birmingham.

Appendix 10

Some of the Health Visitors known to have been employed by Birmingham Council between 1899 and 1918.[1]

Name	Age as per Census	Pay in 1904	Pay in 1918	Address if known	Other Information
Miss Arnold		35s			Superintendent until 1910 when she resigned to get married.
Miss Atkins		30s			
Miss Bamber		25s			
Miss Dutch		25s			
Miss Blanche Gardiner* (*see Appendix of Persons for a more detailed biography).	Age 42 in 1911 census	salary	salary	Living independently in a boarding house at Collen Lane, Grove Avenue, Moseley	Superintendent from 1910 -1929. The census reveals she was born in Leicester. Blanche came from a middle-class family, well-educated with a BA degree. Qualifications in 1910 were Sanitary Institute certificate, Bedford College in Hygiene, Physiology, Bacteriology, Chemistry and Physics; St John's Ambulance First Aid and Nursing and certificate for 3 months training in midwifery. Sanitary Inspector at St Pancras. Spent five years organising the voluntary health visitors at St Pancras where she was employed from 1904.
Miss Rosetta E. Gardiner		25s			Rosetta was one of the first health visitors in Birmingham and spoke about the role at a Sanitary Institute Congress in 1900. She is not listed in 1904 which may suggest that she left to work elsewhere or to get married.
Miss Madge Hillas	Age 36 in 1911 census	25s	37s	Boarding with fellow health visitor Mrs Rogerson and her husband at Clovelly, The Avenue, Acocks Green.	Madge was born in Kelton, Kirkcudbright, Scotland.
Miss Miller		30s	44s		

[1] Information compiled from council records, newspapers and The National Archives, Kew, Censuses of England and Wales between 1841-1911. Census records via *Ancestry (2002-2024*) https://www.ancestry.co.uk/

Name	Age as per Census	Pay in 1904	Pay in 1918	Address if known	Other Information
Miss Rachel Montgomery	Age 42 in 1911 census	25s	44s	Living independently as a boarder at 336 Moseley Road, Balsall Heath	The census reveals that she was born in Southport, Lancashire. At her lodgings she occupied two rooms.
Miss Alice E Moss	Age 41 in 1911	27s 6d	37s	Does not appear to be living in Birmingham in 1911	Job applications for Superintendent position reveal that Alice was a health visitor in Birmingham. In 1910 she was a Sanitary Inspector and Health Visitor in Battersea with general superintendence of a milk depot. She was unsuccessful at interview for the superintendent's position, but the wages book of 1918 suggests that she returned to the city and became an Infant Visitor. Her qualifications in 1910 were listed as Sanitary Institute Certificate, Sanitary Inspector Exam Board in Hygiene and St John's Ambulance Medallion.
Miss Nuttall		27s 6d			
Miss Ellen Riley	Age 37 in 1901 census	25s		Lived with mother and sister (a schoolteacher) in Hyde Road, Rotton Park	Ellen is not listed in 1904 so must have left post for another position elsewhere or to be married. Ellen was previously a schoolteacher.
Mrs Ellen Maria Rogerson	Age 44 in 1911 census	30s	44s	Lived with husband and a boarder at Clovelly, The Avenue, Acocks Green	The census reveals that Ellen was born in Birmingham, had been married for 7 years and her husband was a factory manager. They had no children.
Miss Swallow		27s 6d			
Miss Marion Sykes	Age 36 in 1911 census	27s 6d	44s	Lived with her widow mother in Shirley Road, Acocks Green	The census reveals that she was born in Edgbaston and that Marion and her mother had a servant.
Miss Alice Mary Vaughan	Age 33 in 1911	30s	37s	Lived with her father (a retired butcher) and her sister at 86 Holliday Road, Handsworth	Also listed in the 1911 census at this address. Household was a female cousin, a boarder and visitor. Alice (not her father) is listed as head of household.

Name	Age as per Census	Pay in 1904	Pay in 1918	Address if known	Other Information
Miss Florence Eliza Wright	Age 33 in 1911	25s	44s	Lived with mother at 24 Leighton Road, Moseley	The census reveals that Florence was born in Chesterfield, Derbyshire. Her mother is aged 60 and listed as married (not widow) but head of household. Florence achieved a first-class certificate in Advanced Hygiene in Board of Education examination 1909. Attended Mr Lovatt Evans' classes at Handsworth Technical school (*Bham Daily Gazette*, 3 Feb 1910). Florence also applied for the Superintendent post but was unsuccessful even though she had been serving as assistant superintendent for four years. Previously a schoolteacher.

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