

**Nineteenth Century Public Health**  
**A Study of Liverpool, Belfast and Glasgow**

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## Abstract

Urban areas of Britain experienced a number of dramatic changes during the nineteenth century, both a result of and a response to the rapid rate of urbanisation. One of the consequences of this rapid growth was an 'urban penalty', paid in human lives, because such concentrations of population could not be sustained under the existing structures of urban government and administration. The correlation between sanitation, overcrowding and mortality was established at an early stage, but the specific response to this problem was relatively slow, and occurred in different urban areas at different times. This thesis aims at a greater understanding of how sanitary reform was conducted, by studying three cities - Liverpool, Belfast and Glasgow. By using a comparative approach, it is possible to isolate important determinants for sanitary reform. The three cities chosen all experienced rapid population growth during the nineteenth century, resulting in very similar economic and social structures. They also endured the same consequences, in the form of some of the highest mortality rates in Britain, an uncontrolled expansion of the urban area, and the failure of existing municipal services, such as water supply and drainage systems to cope with the sudden increased demand.

The thesis thus identifies how urban government in the three cities adapted to meet the new requirements placed upon it. A central concern is also to assess whether the local government system responded effectively to the needs of all the urban social classes, or whether the motivation for the introduction of sanitary services was for primarily financial reasons. To evaluate the mechanisms which underpinned the urban governmental and administrative systems, use is made of the municipal archives for each city, supplemented by local newspapers to assess the impact of pressure groups operating outside the formal local government system.

Three key hypotheses are tested in the thesis. First, that pressure from urban minorities will be translated into representation on the municipal council, or if this administrative body does not have sufficient control over sanitary reform, then alternative providers of municipal services will be developed. Secondly, that the larger units of urban government will be more competent to provide public services, and that they will draw increasingly on the expertise of 'professional' sanitary personnel. Thirdly, that the control over sanitary policy was transferred during the course of the century from the elected councillors to the salaried employees, and that the location of power within the urban governmental system could have a great impact on the process of sanitary reform. Integral to the research is an investigation of the intra-urban mortality differentials which existed in Liverpool, and the changing components of the nineteenth century mortality decline in each of the three cities.

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## Chapter One

### The Nineteenth Century Public Health Debate

With cities, it is as with dreams: everything imaginable can be dreamed, but even the most unexpected dream is a rebus that conceals a desire or, its reverse, a fear. Cities, like dreams are made of desires and fears, even if the thread of their discourse is secret, their rules are absurd, their perspectives deceitful, and everything conceals something else.<sup>1</sup>

The rapid rate of urbanisation in the nineteenth century in Britain produced a new species of towns, of larger sizes and conforming to different codes of conduct from their predecessors. As Fraser has noted

It was only in the so-called 'age of great cities' that society needed that essential combination of preventive medicine, civil engineering and community administrative and legal resources known by the generic term 'public health'.<sup>2</sup>

How was this 'need' identified within nineteenth century society? The most visible and distressing evidence were the mortality rates which seemed to be correlated with the size of the urban area. A parallel set of evidence was the visual decay of the urban environment, which was trying to cope with the saturation of migrants looking for accommodation.<sup>3</sup> These problems eventually reached a point at which they roused the concern of the 'responsible parties'. This can be dated to the 1830s and 1840s, and what initially started as an investigation into the 'health of the population' was transformed into an awareness of greater evils within the new society - that poverty was both as result of and a cause of illness.

It is among the Irish that fever especially commits its ravages; and it is they who object the most strongly to be removed to the hospital from their miserable abodes. Nor does the evil stop with themselves. By their example and intercourse with others they are rapidly lowering the standard of comfort among their English neighbours, communicating their own vicious and apathetic habits, and fast extinguishing all sense of moral dignity, independence and self respect....I am persuaded that so long as the native inhabitants are exposed to the inroads of the

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<sup>1</sup> I. Calvino, *Invisible Cities* (London: Picador, 1990)

<sup>2</sup> D. Fraser, *The Evolution of the Welfare State* (London: Macmillan, 1984) p. 56

<sup>3</sup> J. Williamson, *Coping with city growth during the British industrial revolution* (Cambridge: Cambridge University Press, 1990)

numerous hoards of uneducated Irish, spreading physical and moral contamination around them, it will be in vain to expect that any sanitary code can cause fever to disappear from Liverpool.<sup>4</sup>

A fundamental belief that permeated much of this concern was that the living conditions and levels of poverty existing at this time were 'uneconomic', and that a rigorous sanitary campaign would actually save money in the long run.<sup>5</sup>

A central question in this chapter is how this period of British history been used by historians and for what purposes. An examination of previous approaches will highlight the possible formats for this thesis, as well as identifying areas which have been neglected. It is evident that there are several distinct 'strands' of history covering this period, which until recently have progressed independently with only minor regard for one another. The development of a truly interdisciplinary study area then, must only benefit the overall understanding of the period. An analysis of these various 'strands' will serve to identify what can be amalgamated, and what the implications are for this thesis. The structure of this chapter will therefore consider the three main areas of historical research which the thesis draws upon - urban / local government history, medical history and public health history, particularly focusing on how single indicators of the socio-economic state of the urban environment, for example cholera, have been used as templates for other studies.

## 1.1 Urban History

Urban history has progressed within several disciplines. Historical geographers shifted their attention in the 1960s to towns and cities in the light of recently available census material for the 1840s and 1850s, and the developments of the 'quantitative revolution'. Data was made available to test the theories on the economy of urban areas, and the social area theory which suggested the existence in the nineteenth century city of at least three types of segregation - by socio-economic status, family status and migrant status.<sup>6</sup> The use of census enumerators books has altered the focus of research from 'the morphology of the built environment to the morphology of the social environment'.<sup>7</sup> Another suggestion, made in the light of new census information, was that there was a continuum of evolution between the pre-industrial city as identified by

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<sup>4</sup> W. H. Duncan, *On the Sanitary State of Liverpool*, report for the Inquiry into the Sanitary Condition of the Labouring Population 1842 (HL) XXVII p.292

<sup>5</sup> A. Briggs, *Victorian Cities* (London: Pelican, 1968) p. 21

<sup>6</sup> R. Dennis, *English Industrial Cities of the Nineteenth Century* (Cambridge: Cambridge University Press, 1984) p. 3

<sup>7</sup> D. Denecke and G. Shaw, *Urban Historical Geography* (Cambridge: Cambridge University Press, 1988) p. 12

Sjoberg and the modern city as identified in the ecological theory of Burgess.<sup>8</sup> This leads Dennis to make the statement that :

few quantitative geographers showed much sensitivity to the subtleties of class and status that have been central to the work of many social historians ... nor have they paid sufficient attention to the state of the local economy, the level of unemployment or the political or religious feelings locally dominant on 30th March 1851 and other equivalent census days.<sup>9</sup>

The work of historians during this unsettled time has been catalogued by Fraser and Sutcliffe.<sup>10</sup> Concerns over the future of urban history were expressed more tentatively than in the geographical world. Dyos announced that urban history should be focussed 'on characteristics *of* cities rather than merely *in* cities'<sup>11</sup> and this is the calculated approach he used in constructing detailed case studies of particular places. Likewise, Briggs only made generalisations and 'soft' theories after he had studied cities in their entirety, and made comparisons. His research into nineteenth century Birmingham and Manchester for example, investigates every aspect of society. An important issue which he raises in his paper in Dyos and Wolff's classic book *The Victorian City* is that we must be more aware in our analyses of how the Victorians themselves viewed their surroundings. This is important for two reasons. First, the subjective information contained in novels, diaries and letters provides us with some 'flesh' to cover the skeleton of the social structure as revealed in the censuses. Secondly, we must attempt to put ourselves into the Victorian frame of mind in order to be able to accurately interpret their reactions to their environment. Any attempt to evaluate their decisions with our twentieth century values and preconceptions will lead to a mis-understanding of situations or missing the crucial points of debates altogether. Briggs states at the outset of his book 'Victorian Cities' that:

The first effect of early industrialisation was to differentiate English communities rather than to standardise them.<sup>12</sup>

This contrasts with the view of Mumford who lumps together Birmingham and Manchester as 'insensate industrial towns' whereas Briggs states that 'in fact they diverged very strongly in their economic life, their social structure and their politics'.<sup>13</sup> Waller identifies with Briggs' concern to focus on the uniqueness of towns. He

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<sup>8</sup> R.E. Park, E.W. Burgess and R.D. McKenzie, *The City* (Chicago: Chicago University Press, 1925)

<sup>9</sup> R. Dennis, *op.cit.*, p. 5

<sup>10</sup> D. Fraser and A. Sutcliffe, *The Pursuit of Urban History* (London: Edward Arnold, 1983)

<sup>11</sup> D. Cannadine and D. Reeder (eds.), *Exploring the Past: Essays in Urban History by H.J. Dyos* (Cambridge: Cambridge University Press, 1982) p. 208

<sup>12</sup> A. Briggs, *Victorian Cities* (New York: Harper and Row, 1963) p. 32

<sup>13</sup> L. Mumford, *The City in History* (New York: Secker and Warburg, 1961); A. Briggs *op.cit.*, p. 32; P.J. Waller, *Town City and Nation*. (Oxford: Oxford University Press, 1983)

highlights the difference between Liverpool and Manchester as expressed in the phrase 'Manchester men, Liverpool Gentlemen', which says so much more about the image of Liverpool as a civilised city of merchants compared to the industrialists of Manchester, than can be shown in an occupational analysis.<sup>14</sup> As well as considering these features of nineteenth century cities, attention must be given to the relationship of the city with the surrounding area. Were they all local capitals like Manchester, or did their influence stop at the city boundary as Briggs suggests was the case with Leeds? The traditional techniques and pre-occupations of these groups of researchers has therefore conditioned the type of analysis that nineteenth century towns and cities have been subjected to.

Parallel to this multi-disciplinary approach to recent urban historical geography runs another trend of shifting theories or paradigms. As techniques for research have evolved, the underlying philosophical structure has changed. The 'Quantitative Revolution' of the 1960s led to a positivist approach to urban historical geography, in which the methodological procedures and questions of the natural sciences were transferred intact to the arena of social science. Sayer summarises the implications of positivism:

if we are to explain processes we must discover regularities or universal laws governing their behaviour. Hence the thrust of research must be towards the discovery of order.<sup>15</sup>

This philosophical basis for historical geography has subsequently come in for much criticism, aimed at the inappropriateness of positivist theories, and the way in which more traditional historical and subjective techniques were discarded. Some of the more suitable parts of positivism can be salvaged for use in urban history. The objective investigations using computerised techniques can be applied to nineteenth century data sets such as the census material and the results used to test general hypotheses on processes operating within the all urban societies. These 'facts' can in turn be used as the starting point for more subjective investigations of urbanisation - focussing on the politics, religion and culture which do not tolerate such rigorous statistical tests.

The dissatisfaction with positivism in its entirety led to the development of a number of alternative philosophies, all of which were aimed at greater understanding of the geographical world. Humanism focuses on the actor and his relationship with the environment. This approach can be useful for evaluating how migrants reacted to their new surroundings and how they located themselves within the urban labour market. It can also aid our understanding of particular individuals who had a great impact in cities

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<sup>14</sup> P.J. Waller, *op.cit.*, p. 87

<sup>15</sup> A. Sayer, 'Realism and Geography' in R.J. Johnston (ed.), *The Future of Geography* (London: Methuen, 1985), p. 161

and who drew their inspiration from the urban worlds they lived in. This to some extent pacified the demands of geographers to make more use of the visual information available, but its weakness lay in its stress on the actor as an individual. It thus does not attempt to recognise that individuals are restricted in their decisions by larger forces within environments, either natural or artificial. Humanism does not consider the relationships which accompany urban life - the idea of 'living in proximity by consent'.

### *Theoretical structuralism*

This leads to a second alternative to positivism as a base theory for urban historical geography - structuralism. A variety of structural approaches have been identified in the social sciences, but they are all linked by the principal idea that to understand events at the empirical level (every day actions within urban life) we must have an explanation of the driving forces within large structures such as cities and economies. A development of the main structuralist philosophy has been 'marxist structuralism' which identifies three levels in its model. First, at the bottom (real) level there are the actual mechanisms which drive the society or structure. Secondly, the decision making level (actual) contains the individuals who respond to their interpretations of the real level. Thirdly, there is the empirical level where the outcomes of the decisions are evident. There have been several criticisms of this attempt to develop a structuralist framework for urban historical geography. Some are linked to the 'political' intonations of the theory, but as Harvey explains, structuralism and marxism are not one in the same. Structuralism seeks to understand the world while marxism seeks to change it.<sup>16</sup> A second kind of attack has come from Carter, who worries that structuralist urban geography will lead to an abandonment of the concern for spatial structure. He prefers to maintain a distinction between urban history which is concerned with urban life and the formal and informal institutions which operate it, and the urban geography which focuses on patterning and distribution.<sup>17</sup>

The decision, then, to find the most suitable organising paradigm which offers us an appropriate framework for the analysis of the cities of Liverpool, Belfast and Glasgow is a difficult one. Having evaluated how geographers and historians have used the alternatives it is possible to see that there are no easy answers. Structuralism, with its neat levels and mechanisms is an appealing choice, but it must be tempered with a recognition of the importance of more subjective techniques and the use of the Victorians' own perception of their cities and problems. Gregory recognises that:

a genuinely structural historical science must be grounded in an explicit problematization of discourse, one which refuses to take constructs and

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<sup>16</sup> D. Harvey, *Social Justice in the City* (London: Edward Arnold, 1973) p. 129

<sup>17</sup> H. Carter, *An Introduction to Urban Historical Geography* (London: Edward Arnold, 1983) p.xiii

typifications of either past or present life worlds for granted, but which relates them to the social practices whose textures and rhythms reveal and form their constitutive social structures.<sup>18</sup>

The next stage is to decide on which aspects of urban life to focus. Hobsbawm has produced a useful working model for prioritising research, consisting of seven sections:

1. The material and historical environment.
2. The forces and techniques of production.
3. Demography.
4. The structure of the economy.
5. Social relations arising from 4.
6. Institutions and images of Society.
7. The historical context of the social structure.<sup>19</sup>

This type of checklist ensures that the historian does not lose sight of possible influences or relationships which may contribute to the socio-economic structure. In the course of constructing the chapter positioning and contents, this list has been useful.

Marxist historians have used the nineteenth century urban stage to evaluate the role of capital in class formation. The central argument of Marxian theory is that class consciousness will increase as the once-distinct parts of the capitalist economy interlock in the new urban environment. This line of investigation has been adopted by Foster in his study of Oldham, Northampton and South Shields, which considers the industrial revolution as a social process.<sup>20</sup> He pays homage to Briggs' theory that early Victorian cities were characterised by variety and uniqueness with any similarities in the economy only occurring on the superficial level, and moves on to suggest that we ought to allow for greater variation within industries, thus giving rise to different perceptions of towns which were engaged in the same trades. According to Foster, Manchester should be re-evaluated as a city in which class tensions were not so extreme, as the employment basis was very fragmented in comparison with towns such as Glasgow, where dependence on a limited number of industries led to a social structure divided strictly on class lines. This thesis should therefore allow for a reinterpretation of the classic view on the formation of class tensions within urban society, and to test a more controversial hypothesis of Foster's, related to how groups seeking power recognised the need to capture minor institutions and offices in township and parochial government. Foster claims that real power in the urban environment lay with minor offices. He re-assessed

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<sup>18</sup> D. Gregory, 'The Discourse of the Past', *Journal of Historical Geography* (1978) p. 173

<sup>19</sup> E.J. Hobsbawm, 'From Social History to the History of Society' in M.W. Flinn and T.C. Smout, *Essays in Social History* (Oxford: Oxford University Press, 1979) p. 3

<sup>20</sup> J. Foster, *Class Struggle and the Industrial Revolution - Early Industrial Capitalism in Three English Towns* (London: Weidenfeld, 1974)

the importance attached to parliamentary elections and in doing so wins some allies in the battle for a broader approach to the exercise of authority in the Victorian city. A re-evaluation of Oldham by Gadian in 1978 must however, caution us against an uncritical acceptance of a fashionable hypothesis.<sup>21</sup> Foster's picture of Oldham as a hot bed of class struggle and newly emerged class consciousness is somewhat diminished by Gadian's comparative study of a selection of Lancashire towns, in which Oldham emerges as the least developed socially and economically. It was characterised by small firms, with a high degree of social harmony and co-operation within the economic structure. Gadian shows that there was less independent working class activity than in the other cotton towns. Stedman Jones' work on the class structure in London has a more spatial element than most of the marxist works.<sup>22</sup> However, many fall short of the claim by Kearns that a use of Marxian theory 'highlighting the social organisation of the physical fabric of society, can certainly take historical geography beyond the mere mapping of artefacts'.<sup>23</sup>

### *Practical structuralism*

Society and its relationship with the economy must be one of the main concerns of this thesis. Using a structural mode of enquiry it should be possible to look at various forms of intervention in the urban environment - from politics at the national and local levels to the financing of urban improvements. Sutcliffe recognises the way in which the decision makers (the actual level in the Marxian structural model) respond to crises in the urban environment when the actual does not meet the desired performance, is an important indicator of the processes operating at the 'real' level in the model, i.e. class formation and the operation of the urban and national economy.<sup>24</sup>

It is possible to identify the decision makers in the urban environment, as operating therefore within a structuralist model of urban change in the nineteenth century. The obvious ones are the elected representatives of the urban population, such as the councillors and politicians. This particular group of decision makers has been the focus of research by Hennock, who uses detailed analysis of nineteenth century town councils to develop a model of interaction between local government and the urban

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<sup>21</sup> D.S. Gadian, 'Class Consciousness in Oldham and other North West Towns 1830-1850', *Historical Journal* 21, 1 (1978) pp.161-172

<sup>22</sup> G. Stedman Jones, *Outcast London - a Study in the Relationships between classes in Victorian Society* (London: Clarendon, 1971)

<sup>23</sup> G. Kearns, 'Making Space for Marx', *Journal of Historical Geography* 10 (1984) pp. 411-417

<sup>24</sup> A. Sutcliffe, 'The Growth of Public Intervention in the Urban Environment during the Nineteenth Century - a Structuralist Approach' in J.H. Johnson and C.G. Pooley (eds) *The Structure of Nineteenth Century Cities* (London: Croom Helm, 1982)



social structure.<sup>25</sup> Hennock's meticulous reconstruction of the social composition of councils is rewarding in that it adds detail to our picture of how local government evolved. There is a clear definition of a councillor which emerges during the course of the century, which is centred on the gentlemen of leisure, who have the necessary time and money to devote themselves to municipal management. However, Hennock himself admits that an occupational survey of the councillors alone is not a conclusion that can be relied upon.<sup>26</sup>

Other decision makers did not have the mandate of the local people. These include the central government officials who formulated new 'standards' for urban services such as water supply and sewerage systems. Edwin Chadwick is a prime example of this type of 'one size fits all' policy. His aim was to install an integrated sanitary system in every town, so that sewerage could be recycled as agricultural manure. Such national experts did not operate in response to their perceptions of the mechanisms of a unique urban place, but in response to the demands of the nation. However, their outcomes (the empirical level of the model) are felt in the locality. Likewise, pressure groups have an impact on the decisions made at the actual level but they may not express the opinion of the majority of the urban population. An example of this is the pressure of the 'economists' on municipal spending in cities where the majority of the inhabitants would probably not object to improvements in the infrastructure. An important conclusion which emerges from this thesis (and is developed in detail in chapter seven) is that the weakness of any one of these groups of decision makers is compensated for by an expansion in the role of an alternative. For example, in Belfast, it can be seen that the relative impotence of the municipal corporation results in a transfer of power to the Chamber of Commerce, which undertakes much of the sanitary reform that should have been provided by the council.

The division of power between these various groups within the urban environment was not static, but changed constantly throughout the century. Part of the explanation lies in the relationship between central and local government. As the burden of local government duties increased, so too did the need for additional finance, which could not be met through the rating system. Specific grants from central government towards local services, such as police, and education were therefore accompanied by increased inspection and mandatory conditions. Bellamy has complemented the work of MacLeod in her analysis of the growth of central government influence in local affairs,

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<sup>25</sup> E.P. Hennock, *Fit and Proper Persons* (London: Edward Arnold, 1973), E.P. Hennock, 'The Social Composition of Borough Councils in Two Large Cities, 1835-1914' in H.J. Dyos (ed.) *The Study of Urban History* (London, Edward Arnold, 1968) pp.315-337.

<sup>26</sup> *Ibid.*, (1968) p.318-9.

which was often justified on financial grounds.<sup>27</sup> However, the impetus for change usually came from the locality, particularly from the municipal corporations. They reflected through the electoral system the wishes of some part of the local community. For this reason it is important to investigate how changes in the franchise, especially the growth of the franchise, affected decision making in the cities, and how that in turn altered the outcomes at the 'empirical' level.

## 1.2 The Increasing Role of Local Government

The history of government in the nineteenth century is a complex mixture of politics, administration and finance. The main issue however, that impinges on the urban social and economic structure is local government and its development through the extension of the franchise and the gradual accretion of powers and services. The most common starting point for local government studies is the 1835 Municipal Corporations Act. This was the result of increasing pressure placed on the governmental mechanisms by industrialisation and urbanisation, and articulated by the radicals such as Jeremy Bentham, Francis Place and Joseph Parkes. The subsequent alterations to the franchise and the debate on who ought to be allowed to participate in urban government has been well documented by Keith-Lucas and Fraser.<sup>28</sup> They both identify several fundamental reasons for the reform. First, the growing problem of law and order in the towns. This must have seemed especially acute to the upper classes resident in towns like Liverpool and Glasgow, which were experiencing such dramatic changes in their lower class populations with the influx of the Irish, although none of the cities in this study entertained riots in 1831 like Bristol and Nottingham. Secondly, the unreformed corporations no longer reflected the power base in the urban social structure. A parallel to rapid industrialisation and urbanisation was the creation of a new middle class who were barred from the usual ladders to local power by their religion, lack of 'old money' or political persuasion. The Whig-Radical dissenters were keen for a reform of the old method of election of corporation officials, which frequently involved co-option and life membership. Finally, the 1835 Municipal Reform Act was linked to the 1832 Act which had brought limited representative national government.

The 1835 Act established the principles of urban government which were to persist until the end of the century. Councillors were to be elected for three years,

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<sup>27</sup> C. Bellamy, *Administering Central-Local Relations 1871-1919. The Local Government Board in its Fiscal and Cultural Context* (Manchester: Manchester University Press, 1988). R. Macleod (ed.) *Government and Expertise. Specialists, Administrators and Professionals, 1860-1919* (Cambridge: Cambridge University Press, 1988).

<sup>28</sup> B. Keith-Lucas, *The English Local Government Franchise* (Oxford: Blackwell, 1952); D. Fraser, *Power and Authority in the Victorian City* (Oxford: Blackwell, 1979); D. Fraser, *Urban Politics in Victorian England* (Leicester: Leicester University Press, 1976); D. Fraser, *Municipal Reform and the Industrial City* (Leicester: Leicester University Press, 1982)

mayors and aldermen were to be appointed by the councillors, all debates were to be open and the accounts made available for public inspection. The old definition of the corporation as a body only concerned with the interests of its members was no longer valid. and a trend had been started which placed the care of the whole urban community in the hands of elected representatives. The political implications of the 1835 Act were varied. It was seen as creating a new vehicle for improved law and order, a Whig political machine for the middle classes, and as an attack upon the sacred rights of property. After the passing of the Act most of the corporations changed political allegiance immediately - usually from Tory to Whig, thereby fulfilling the hopes of the Whig government who had perpetrated the Bill. However, the political allegiance of the corporations was not altered permanently. In Liverpool after seven years the Tories gained control. It is only through comparative studies that the true experience of municipal government and its impact on the urban social and economic structure can be appreciated. Perhaps, then, using the evidence of cities like Liverpool, Glasgow and Belfast, we can conclude that the Webbs mis-diagnosed 1835 as a municipal revolution.<sup>29</sup> Maybe it was only a hiccup in the prolonged domination of urban government by the upper class, and Fraser has correctly identified a more evolutionary revolution which took the best part of the nineteenth century to complete, and saw the transition of the fledgling local government into 'powerful agencies with wide social purposes'.<sup>30</sup>

This transformation of the role of the municipal authority was mainly due to the increasing powers it requested from central government to deal with local problems such as sanitation, housing and finance, and also due to the national trend for local authorities to provide a more comprehensive service for the urban dweller. This second development was facilitated by exchequer grants to local government to supplement their finances raised by local taxation. Incidentally this weakened the claims that the municipal franchise should be restricted to those who paid for urban services, as money was now coming from central government surely a wider group of urban residents should decide how it was spent. The accretion of authority was determined initially by corporations adopting permissive legislation and by promoting private Bills. Often the powers were split between a number of urban organisations and the process of rationalisation and consolidation took some time. The period between the creation of reformed corporations and the imposition of the Local Government Board in England in 1871 is an interesting one as it allows us to evaluate how progressive and self-motivated the various corporations were when they were under little pressure to conform to set national standards. Fraser's examination of Liverpool, Leeds and

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<sup>29</sup> S. Webb and B. Webb, *English Local Government* (London: Longmans, 1908)

<sup>30</sup> D. Fraser, *op. cit.*, (1979)

Birmingham identifies some similar components in their respective municipal evolutions - they all experienced the creation of the authority of municipal councils and the definition of similar social roles in municipal affairs.

The work by Keith-Lucas and Fraser on the extension of the municipal franchise and municipal responsibility provides a detailed study of the changing perceptions of the role of the corporation in the urban community. They do not however, pay much attention to the staff who had to effect these changes. The personnel of the corporations evolved during the nineteenth century from upper class philanthropists who had little specialised knowledge of municipal duties, into a professional body with its own rules of conduct and traditions. As central government extended its control over the operations of the municipalities and developed a set of standard statutes for use in all towns and cities, the demand for competent councillors increased. A number of entrance requirements for these offices reduced still further the number of suitable candidates, and the management of the urban economy remained concentrated in the hands of the traditional upper classes. The 1835 act required that prospective councillors have property with a value of £1,000 or a rateable value of £30 per annum, in addition to being on the burgesses roll. They also had to be resident within seven miles of the borough boundary (this was extended to fifteen miles in 1869). Hennock succinctly summarises the dual role of the nineteenth century municipal authorities:

A town council is both a representative assembly and an executive body, and in the committee system it has a means of performing its executive duties. In this respect it is more like the government than like parliament.<sup>31</sup>

When the corporations of the three cities are studied, one must be aware of the fact that the elected officials, through the narrowness of the franchise, reflect the wishes of the minority of the urban population, and that their actions are conditioned not only by local circumstances but also by national politics and compulsory legislation. The actions of the councillors are therefore only partly a response to the pressures of the social structure as articulated by the structuralist model of urban life. The power of the corporation in the urban environment will also be dependant on the strengths of competing bodies. These could be numerous, including Improvement Commissions, Charitable Societies, Private Water Companies, Chambers of Commerce and Harbour Boards. The allocation of authority between these organisations, as determined by local Acts will be reflected in the prestige value attached to serving on their respective boards and committees. Therefore, if the corporation is relatively weak (as in Belfast) ambitious politicians will not waste time in a powerless council position. On the other

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<sup>31</sup> E.P. Hennock, *Fit and Proper Persons* (London: Edward Arnold, 1973) p.7

hand, in towns like Birmingham, where Hennock identifies a social prestige in having a council place, there is an attraction for the social and economic elite, who might otherwise have turned their energy towards achieving positions in national politics or professional organisations. Chamberlain quickly recognised the power base he could build if he could keep the support and attention of the Unitarian and Quaker families in Birmingham.

### 1.3 Medical History

The ongoing changes in medical history represent some of the most fundamental shifts within an academic discipline in recent years. The transformation from essentially biographical studies - those in which the careers of great medical men (and a few women) are documented - to a genuinely social history of medicine has been identified as an overt response to the perceived isolation of the discipline from other branches of academic thought. The first stage in this metamorphosis occurred in the 1950's, through the work of Rosen, Shryock and Ackernecht, who sought to reposition the development of the discipline away from the whiggish interpretations of the rise of the medical profession and medicine as science, as ably expounded by Guthrie.<sup>32</sup> Rosen expressed the new philosophy in this way:

'Medicine is an activity whose developments can be most fully understood only when considered in relation to the network of social interaction within which it occurs.'<sup>33</sup>

This view has been more recently articulated by Webster, writing specifically on the historiography of medicine, who sees the goal of the discipline as:

'A history of medicine that would place its primary emphasis on the changing pattern of health of the population as a whole, and on the mechanisms of health care in proportion to their relevance to the health needs of the major sections of the community.'<sup>34</sup>

Using this agenda, the legitimate subjects for study within the history of medicine widens to include the changing relationship between medicine and the state and the development of scientific medicine, as opposed to public health. Other items include much broader issues which relate to the fundamental concepts of 'health' and 'illness' - who constructed these definitions, and for what purposes?

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<sup>32</sup> D. Guthrie, 'Whither Medical History?', *Medical History* 1 (1957) pp.307-317.

<sup>33</sup> G. Rosen, 'The New History of Medicine: A Review', *Journal of the History of Medicine and Allied Sciences*, 6 (1951) pp.516-522.

<sup>34</sup> C. Webster, 'The Historiography of Medicine', in P. Corsi and P. Weindling (eds.) *Information Sources in the History of Science and Medicine* (London:Butterworths Scientific, 1983) p.40.

### *Diseases as Indicators*

Continuing in this theme of public response to medicine in all its guises - disease, doctors, hospitals, germ theory, etc., it is possible to identify two broad areas in which diseases have been used as historical 'workhorses'. First, to highlight the mechanisms of social and political change. For this purpose cholera has been most commonly and successfully used. The 1832 cholera pandemic provides the ideological framework for several classic studies by Durey, Evans, Kearns and Morris.<sup>35</sup> Some have argued that Cholera has 'been done to death' by such studies, at the expense of research into other sanitary diseases.<sup>36</sup> However, the variety of approaches used by the above scholars is indicative of the importance of cholera in a number of areas of research.

The actual mortality from cholera was slight in comparison to rates in Asia and Europe, and in comparison to earlier epidemics in Britain.<sup>37</sup> The importance of the 1832 cholera outbreak lies therefore, not in the number of deaths, but in the contemporary perception of the disease. It provoked a crisis atmosphere both within popular culture and within the governmental structure, which Durey suggests can be utilised to uncover the deeper mechanisms of society which are not normally observable. His approach is useful in highlighting the social disruption caused by the cholera epidemic compared with that provoked by political crises, and by correlating working class unrest with the distribution of schools of anatomy, he goes some way to exposing the innate distrust which the poor had of the medical profession. The governmental sanction for the medically based responses (which were modified after the assimilation of information from Europe on how to deal with the epidemic) only antagonised the existing fear and hatred which the poor had for the medical profession. This, therefore is the context in which the efforts of the Central Board of Health must be evaluated.

Morris also recognises the way in which the 1832 cholera crisis can be used to show other socio-political trends within society at that time. He suggests that the ruling classes were initially over zealous with their regulations and hospitals, which they subsequently had to modify when they came up against organised resistance from the working classes. His overt recognition of the social instability of early nineteenth century England mirrors the approach of Eversley, who identified in London a potential

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<sup>35</sup> M. Durey, *The Return of the Plague: British Society and the Cholera 1831-32* (Dublin: Gill and Macmillan, 1979), R. J. Evans, *Death in Hamburg* (Oxford: Clarendon, 1987), G. Kearns, *Aspects of Cholera, Society and Space in Nineteenth Century England and Wales* (Unpub. Ph.D. Thesis, Cambridge University, 1985), R.J. Morris, *Cholera 1832* (London: Croom Helm, 1976),

<sup>36</sup> B. Luckin, *Pollution and Control: A Social History of the Thames in the Nineteenth Century* (Bristol: Adam Hilger, 1986) p.2.

<sup>37</sup> G. Kearns, op.cit., (1985) p.2.

revolution in the making, and who argued that the cholera epidemic was a timely diversion from the demand for political reform.<sup>38</sup>

Another aspect of cholera which has been the focus of much research is the role of the 1832 epidemic in the development of a distinct public health movement within Britain. The immediate response of the authorities was provoked by fear, but with the passing of the epidemic, there is little evidence to suggest that there was a continued effort to sanitise the urban environment. Morris and Durey concur with Briggs' view that there was no continuity between the 1832 cholera epidemic and the 1848 Public Health Act.<sup>39</sup> Cholera is credited with a minor part in the stimulation of sanitary reform. It is seen as a temporary threat rather than as an indicator of underlying sanitary problems. Kearns' research on the London Borough of Islington attempts to move away from the limiting explanatory framework for public health, which is based on centralisation, interventionism and government growth. His approach to isolating the 'dramatic' from the 'long term' motives for sanitary reform is to compare sanitary activity in both cholera and non-cholera years. He concludes that the differences between cholera and non-cholera years were in degree, not kind. There were more nuisances cleared, more medical relief provided, more roads cleaned, but no fundamental change to the sanitary ideology.<sup>40</sup>

A second way in which diseases have been used within urban history is to indicate the epidemiological and environmental processes at work within nineteenth century urban Britain, particularly features such as the growing pollution of rivers and the atmosphere.<sup>41</sup> The relationship between human welfare and the environment is increasingly the focus of research, from urban and medical historians. The environmental correlations were made by the nineteenth century urban dwellers themselves, but initially not always for the right reasons. Recent research has used a number of epidemiological indicators to highlight changing levels of pollution, and the responses to them. Typhoid, cholera and diarrhoea are all used by Luckin as indicators of water quality and quantity, as well as showing the changing theories of the spread of disease - from the miasma theory to germ theory.

This leads on to a distinct sub-discipline of medical history which has been termed 'micro-organic determinism' - the hypothesis that some of the changes in the mortality and morbidity levels of specific diseases were effected by less by medical treatment than by changes in the strength of the microorganism that carries the disease. Thus much of the credit for the reduction in mortality from scarlet fever, which the

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<sup>38</sup> D.E.C. Eversley, 'Le Cholera en Angleterre' in L. Chevalier (ed.) *Le Cholera: la premiere epidemie du XIX siecle* (La Roche-sur-Yon: Imprimerie Centrale de l'Ouest; 1958) pp.157-188.

<sup>39</sup> A. Briggs, 'Cholera and society in the nineteenth century', *Past and Present*, xix (1960-1) pp79.86.

<sup>40</sup> G. Kearns, *op.cit.*, (1985) p251.

<sup>41</sup> B. Luckin, *op.cit.*, (1986).

medical profession have written into their list of achievements, should rightly be re-attributed to a change in the nature of the haemolytic streptococcus itself. In this field of research, the work of McKeown and his associates, and latterly the work of Riley has done much to correct for the traditional bias of medical historians, which focused on the innovations in treatment rather than the patients themselves.

The conclusion must be, therefore, that medical history is now being written with competence equally well by urban historians, as by medical historians. By moving towards a genuinely *social* history of medicine, emphasis is placed on the relationships within the society which illuminate the trends in population change, mortality and morbidity levels as well as the traditional concerns for the types of treatment, and those delivering it.

#### 1.4 Public Health History

The history of public health developments in Britain has evolved naturally from the work of both urban historians and medical historians. This is in part a response to the actual mechanisms through which public health measures were introduced. They were almost exclusively urban, financed and planned by urban authorities. A contributory factor is the fact that early public health histories were written from a primarily sanitary perspective, with the emphasis on a medical interpretation of public health, and the subsequent medical solutions.

The first generation of municipal histories have already been written, often in the form of celebratory centennial reviews of individual towns' municipal achievements. For these historians, public health was identified as an item of expenditure, a corporation committee or a reduced mortality rate. So many of the public health chapters of town histories have the same structure and content. They construct an interpretation of public health based mainly on the historical administrative arrangements of the municipal authority.<sup>42</sup> They thus contain a detailed description of the vaccination campaigns, sanitary visiting, abattoirs inspected per annum, bed provision in the municipal hospital and other specifically sanitary provisions. Other activities, which have since been re-classified as 'public health', were relegated to chapters according to their departmental origins - drainage and road schemes with engineering, clearance of slum properties with housing. National histories of public health also took a 'sanitary' checklist for their contents. See for example, Frazer's encyclopaedic *A History of English Public Health* and Brockington's *Public Health in*

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<sup>42</sup> See for example, J. Bell and J. Paton, *Glasgow, Its Municipal Organisation and Administration* (Glasgow: James MacLehose and Sons, 1896)



*the Nineteenth Century* <sup>43</sup>. Brockington's preface concentrates almost exclusively on the roles played by Chadwick and Simon, and his text is arranged around the themes of public health at the Privy Council and the duties of Medical Officers of Health. Brockington's limited vision of the definition of public health becomes more understandable if one recognises that at the time of writing in 1965 he was Professor of Social and Preventative Medicine at the University of Manchester. His ignorance of the contribution of civil engineers, and the public health staff of the municipal corporations, is tolerable. Likewise, Williams' *A Century of Public Health in Britain 1832-1929* <sup>44</sup> evaluates public health successes in mainly medical terms.

However, the work of the national figures in the public health story has been faithfully documented in a number of studies, especially Finer and Lewis on Edwin Chadwick and Lambert on Sir John Simon.<sup>45</sup> These give a wonderful insight into the conditions in British towns and cities in the early nineteenth century, and progress to detail the administrative solutions which Chadwick and his successors developed.

To complement these 'biographical' public health histories, modern public health historians have corrected for the earlier 'administrative' styles (such as Brockington's). The histories they have produced have moved beyond the sanitary interpretation of public health, and have taken a new perspective to understand the transformations which took place in British urban areas in the nineteenth century. Examples of the new style of public health history include Wohl's respected work *Endangered Lives* <sup>46</sup> which recognises river and air pollution, contamination of food, industrial working conditions to be as much a part of public health as domestic sanitation and infectious diseases. Public health has been re-positioned within academic work as an overtly interdisciplinary subject, which can be explored through the traditional channels of administrative history, urban history and medical history.

## 1.5 The structure of the thesis

This chapter so far has established a number of facts. First, that public health was an urgent concern in nineteenth century Britain, mainly because of the rapid rate of urbanisation, which was not matched by an associated development in systems of

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<sup>43</sup> W.M. Frazer, *A History of English Public Health* (London: Bailliere Tindall and Cox, 1950). C. Fraser Brockington, *Public Health in the Nineteenth Century* (Edinburgh: E.&S. Livingstone Ltd, 1965)

<sup>44</sup> J.H. Harley Williams, *A Century of Public Health in Britain 1832-1929* (London: A&C Black, 1932)

<sup>45</sup> S.E. Finer, *The Life and Times of Sir Edwin Chadwick* (London: Methuen, 1952), R.A. Lewis, *Edwin Chadwick and the Public Health Movement 1832-1854* (London: Macmillan, 1952), R.Š. Lambert, *Sir John Simon 1816-1904 and English Social Administration* (London: MacGibbon and Kee, 1963)

<sup>46</sup> A. S. Wohl, *Endangered Lives: Public Health in Victorian Britain* (London: Dent, 1983)

urban management. Secondly, by focusing on this historical period, it is important to be aware of the variety of causes which it has already been used to investigate - namely, the history of medicine, the changing political structure, and the development of new forms of government. These studies have used a number of different approaches, often coloured by the contemporary fashions for quantitative or qualitative research. Having reviewed these various approaches it would appear that a modified form of structuralism will be useful to ensure that the fullest possible understanding can be made of the mechanisms of the nineteenth century urban environment.

Research to date has not directly addressed the function of the local administrative arrangements. This research will therefore be explicitly focused, to evaluate the introduction of sanitary systems as a result of firstly the local political and administrative structures, and secondly, the translation of class specific concerns for the sanitary state of the urban environment.

A comparative study of the public health experiences of three cities is useful for a number of reasons. Primarily, it should provide a 'control factor' which is not available with single city studies. To put this into simple terms - if the three cities all experienced rapid population growth it is likely that they also had similar problems resulting from this collective experience, namely high mortality rates and ineffective urban services. However, their awareness of, and responses to, these problems may not have been identical. More importantly, they may not have adopted the same package from the plethora of solutions offered to them.

The thesis thus has parallel themes, focusing on the quantitative mortality evidence, and on the more subjective urban government responses. The main aims are first to use the detailed mortality data to establish the extent of the 'sanitary problem'. Secondly, the control of the urban environment can be investigated - by looking at who decided how sanitary reform should be implemented, and whether local factors (such as the power of an individual within an urban authority) superseded national trends in urban management. There was a delay in the formalisation of the process of decision making in the urban environment, a result of the rapidity with which the responsibilities had increased, and the lack of an existing class of skilled urban managers. The evolution of the 'municipal employee' is not considered by previous research as a serious determinant of sanitary reform. Some basic guidelines thus need to be produced which identify the role of the employee in the policy formulation and administration of urban management.

Liverpool, Belfast and Glasgow were chosen for this comparative study for a number of reasons. They all had high rates of mortality during the period, often vying for position as the 'unhealthiest city' of Britain. Of course, there were many towns and cities during this period which suffered from high mortality rates, so some other

selection criteria has to be used. These three cities were identified as having 'sanitary problems' by their inhabitants, and by the national authorities, whether this be poor drainage, inadequate housing, deficient water supply or lack of urban infrastructure. They had similar economic structures, all being port based communities, with the ensuing unstable employment opportunities. They also all had potential sectarian problems, Belfast because it was a Protestant stronghold in a Catholic 'separatist' province, and Liverpool and Glasgow because of their large Irish workforces, competing for employment with 'locals' in a volatile job market. Chapter two investigates the relationship between religion, class, politics and employment in more detail. This theme of intra-urban religious and political divisions has been developed recently in an edited collection *The Irish in the Victorian City*<sup>47</sup> which highlights valuable testing ground which the Irish provide for investigating class and religious tensions in a situation of unstable employment. Chapter three presents information on the demographic patterns in the three cities, with particular emphasis on the mortality patterns which may have a relationship with sanitary systems.

Having established the political, economic and demographic situations in the opening chapters, the thesis moves on to consider how public health ideology influenced the introduction of water and sewerage systems in chapters four and five respectively, and baths and wash-houses in chapter six. Baths and wash-houses was selected for detailed research from the wealth of 'secondary' sanitary schemes because of its marginal position within municipal public health planning, and its important contribution to the debate on municipal trading. It therefore presents an ideal opportunity to understand the principals behind local government investment - whether it was a concern for the health of the urban inhabitant, or a desire to maximise corporation revenue through profit-making activities. These three chapters are thus concerned with the management of major urban infrastructural projects, which provide an ideal framework through which to evaluate the tensions in the urban environment - were the failures of the councils due to the financial difficulties of the schemes, incompetent municipal personnel or a lack of support from the enfranchised population?

Chapter seven discusses the development of professional public health staff within the municipal structure. A key hypothesis which is presented in this chapter is that the fundamental division of public health duties into medical and engineering departments reflects the existing reputations of the two professions, and the public's perception of how a healthier environment can be achieved. Chapter eight draws together the conclusions from the other chapters, and presents a new set of hypotheses to explain the introduction of public health systems in the nineteenth century, which

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<sup>47</sup> R. Swift and S. Gilley (eds.) *The Irish in the Victorian City* (London: Croom Helm, 1985)

explicitly recognises their contribution to the mortality decline and the growth of local government control of the urban environment.

It is to be hoped therefore, that our understanding of each of these cities will be enhanced by a comparison with the other two, and with our existing knowledge on how nineteenth century urban areas functioned. By investigating a wide range of urban problems, it should be possible to produce a more comprehensive checklist of the solutions to them, and a basic understanding of why certain cities went for some options and not others. Comparison, of course, should not be restricted to similar cities. Much can be gained by comparing very different cities, in terms of their location, size, employment base, etc. For that reason, where appropriate, information is provided in the thesis on alternative systems of sanitary reform or urban government.<sup>48</sup> However, in order to achieve any meaningful detail, it has been necessary to restrict the number of cities studied in depth to three. This should allow for an explanation of urban management rather than just a description.

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<sup>48</sup> In particular, the case studies of towns such as Leeds and Birmingham provided by Derek Fraser have been invaluable.

## Chapter Two

### The History, Geography and Politics of the Three Cities

Life must be lived forwards, but it can only be understood backwards.<sup>1</sup>

#### 2.1 Introduction to the Three Cities

Chapter one established the structure for the thesis and stressed the comparative tone which will be found in each of the substantive chapters. The purpose of this chapter is to give an introduction to the three cities. By looking at their respective locations, one can make some judgements about their role within the national economy, and their individual histories. By establishing at this stage what the cities have in common, we can interpret how their progress through the nineteenth century differed and why. They are similar today in the views of many people - all three have suffered in the recent economic depressions, they have a collective image as bleak cities, sometimes beyond the control of the governmental structures that they developed so successfully in the nineteenth century. They might almost be seen as the *uncivilised* side of British culture today. But they all had their 'heydays' at the same time. They were all boom towns in the last century and in effect they were the leading edge of civilisation within Britain. However, the role of this thesis is not to explain why they have declined, but to explain how they managed their affairs before the fall, and how local conditions determined their responses to, and adoption of national urban government techniques.

A necessary companion to the detailed studies of the three cities is a concise interpretation of the national developments in the public health debate. This, therefore, precedes the city studies, so that their histories can be evaluated in the light of information which they would have received on sanitary reforms instigated at a national level. This theme of the dissemination of information from 'core' to 'periphery' is returned to in greater detail in chapter seven. After the 'national' analysis, the following sections are organised on a city basis. They focus on the main areas which would have affected the development of public health within the local government system, namely the economic structure, political loyalties and cultural divisions within the cities - which were often religious in origin. Section 2.5 provides the first comparative part of the thesis and determines the expectations for the 'sanitary chapters'.

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<sup>1</sup> S. Kierkegaard, *Stages on Life's Way* (Oxford: Oxford University Press, 1945)

## 2.2 A National Public Health Movement

Section 1.4 of chapter one investigated how the changing definition of public health has determined the contents of the respective 'eras' of public health histories. The first phase was concerned with civic achievement and administrative arrangements, while the more recent histories have moved towards an analysis of environmental pollution, and the use of diseases as indicators of the quality of life. Much of the earlier work is still relevant, especially for providing information on the actual mechanisms through which public health measures emerged, and who achieved them.

The undisputed founding father of the British public health movement was Edwin Chadwick. He has been immortalised through biographies and student textbooks as the zealot who single-handedly pioneered the governmental response to deteriorating urban environments in the nineteenth century. In the creation of the Chadwick caricature, public health history has been written using Chadwick's life as reference points. Thus we talk of pre-Chadwick and post-Chadwick events, and this chronology has even provided titles for public health research.<sup>2</sup>

The rationale behind this deliberate orientation of public health history is understandable. Chadwick's work at the Poor Law Board is generally regarded as the beginning of his concern for the sanitary situation of Britain's towns and cities. It followed on from the earlier 'health of the population' style reports which were produced for towns such as Manchester and Leeds.<sup>3</sup> With the creation of the Poor Law Commission in 1834, and the new drive towards the collection of demographic information, there was a heightened awareness of the state of the population and its living conditions. Therefore, in 1839 when Chadwick was asked to prepare a report for the House of Lords into the sanitary state of the labouring classes, he was well aware of the existing wealth of material, and the expertise available to him in the form of provincial doctors. Chadwick's report finally appeared in 1842, under the title *Report on the Sanitary Condition of the Labouring Population of Great Britain*. Through the presentation of careful case studies, the relationship between environment and disease became formalised. The next stage, according to Chadwick, was the creation of a centralised system to administer environmental controls. This was very similar to the solution he had helped to develop at the Poor Law Board. However, there was no neat progression in the world of public health reform. Instead, Chadwick moved on to report on more technical aspects of public health, in particular, the design of sewer

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<sup>2</sup> E.P. Hennock, 'Urban Sanitary Reform a Generation Before Chadwick?' *Economic History Review*, 10 (1957) pp.113-120.

<sup>3</sup> The best example is probably James Kay's study of Manchester: *The Moral and Physical Condition of the Working Classes* (1832).

pipes and the need for new interment practices. He also worked with the Health of Towns Commission in 1844-45.

The explanation for the lack of follow-up legislation to the 1842 report lies in part with the complicated infrastructure which public health reform would require. The main factors can be grouped under three headings. First, the technical requirements of public health were greater than any other major reform of the urban environment had demanded. The removal of disease meant for Chadwick and his contemporaries the removal of noxious smells, as prevailing miasmatic theory proclaimed that disease was carried in the air. Even though this proved to be incorrect, it still required the same technical solutions which a germ theory of disease would have demanded - namely the removal of sewerage and dirt from the urban environment. Thus public health from a technical perspective involved the design and installation of new water and sewerage systems, which were essentially civil engineering problems.

Secondly, there were financial factors to public health reform. The cost of the new urban infrastructure, as outlined above was massive, and could not be met through the annual recurrent expenditure of the municipal corporations. It had to be financed through taxing the local population. or grants from central government - both solutions had their vociferous opponents. The third group of factors can be called ideological and political. Most aspects of public health reform impinged upon the sacred territory of private property. There was no precedent for telling individuals what services they had to use within their homes, or that they should pay to have the whole urban area upgraded to a uniform sanitary standard. What public health meant to the layman was gross interference and a threat to individual liberty. Public health also meant political transformations. It required a radical re-organisation and consolidation of bodies involved in local government. The previously numerous administrative functions fulfilled by the Improvement Commissioners, Vestries, Guardians, etc. now had to be integrated. The combining of such services created a more powerful local government, which had greater access to finance and thus became a politically more important prize. The struggles against consolidation can be seen in towns like Birmingham, where it took fourteen years to amalgamate the various powers into the municipal corporation. This to a certain extent vindicated Chadwick's call for centralisation of public health services, which he felt would de-politicise the issue at a local level and ensure uniform adoption of the reforms.<sup>4</sup>

The complicated nature of public health reform explains, to some extent, the lag in the introduction of national legislation. However, in the towns and cities of Britain action was already being taken along the lines envisaged by Chadwick. Whether through a desire to beat the demands for centralisation, or a genuine concern to

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<sup>4</sup> D. Fraser, *The Evolution of the British Welfare State* (London: Macmillan, 1984) p.69.

ameliorate the problems of the urban environment, public health measures began to be introduced through Local Acts of Parliament. The most significant of these early Acts was Liverpool's 1846 Sanitary Act. It gave the municipal corporation the authority to appoint a Medical Officer of Health, a Borough Engineer, an Inspector of Nuisances and the necessary administrative support to tackle the problems of disease and poor infrastructure. Much of the Liverpool public health philosophy was repeated in Morpeth's 1848 Public Health Act. This had faced persistent opposition because of its centralist tendencies, and the revised Act was weakened through its permissive rather than obligatory stance. It provided for the creation of Local Boards of Health only if one tenth of the ratepayers petitioned for it, or if the mortality rate was over a certain level. This mechanism for public health reform was not popular, with only 182 boards being created by 1854. Chadwick's public health career was equally blighted, and he was dismissed from the General Board of Health in 1854, with the Board itself folding in 1858.

1858 was a key year for the re-organisation of the public health movement in Britain. The duties of the General Board of Health were split between the Local Government Act Office and the Medical Department of the Privy Council, with Simon as its first Medical Officer.<sup>5</sup> Under this new administrative arrangement, public health legislation continued to be produced. Nuisance Removal Acts were passed in 1848, 1855, 1860 and 1863. A number of sewer authorities were created by the 1865 Sewage Utilisation Act. The Disease Prevention Acts of 1848 and 1855 made it easier for authorities to act against the threat of epidemics. Through a system of loans, sanctioned by Simon, local government now had access to finance to install the infrastructure so urgently needed.

The 1866 Sanitary Act is significant because it transformed formerly permissive powers into compulsory duties for local government. It also re-defined 'nuisance' to include private dwellings, thus bringing them within the inspection system, and liable to prosecution. The Act was a step forwards, but not really sufficient, and a Royal Sanitary Commission was established in 1869, which resulted in a further re-organisation of public health administration in 1871. This involved the creation of the Local Government Board which encompassed the roles of the Local Government Act Office, the Medical Department of the Privy Council, the Registrar General's Office and the Poor Law Board. In the following year (1872) the Public Health Act set up a network of Sanitary Authorities (mainly titles adopted by municipal corporations and Boards of Guardians). The Act also compelled the employment of public health staff, most crucially, a Medical Officer of Health.

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<sup>5</sup> John Simon had previously been the Medical Officer of Health for London 1848-1855, and then Medical Officer to the General Board of Health 1855-58.



The pattern which emerges from the detail presented above is one of a gradual, but by no means logical production of an integrated and efficient public health system, in which action taken at a local level was ordered or condoned by a central authority. It is evident that there was considerable scope in the early years for towns to deviate from the Chadwickian-inspired sanitary utopia. What prompted individual towns to adopt or reject public health measures thus becomes an important indicator of political, social and economic pressures within an urban community. With this in mind, the following sections of the chapter aim to build up an understanding of the similarities and differences between Liverpool, Belfast and Glasgow, in the hope that some hypotheses can be produced to explain their distinctive public health histories.

## 2.2 Belfast

### 2.2.a Geography and Economy

The name of the city comes from 'beal-fersat' meaning the approach to the sand bank or crossing. This gives the clue as to the rationale for the site, it was the lowest crossing point on the River Lagan, and conveniently situated at the head of Belfast Lough. The site is a flat river outwash plain with the Antrim mountains forming the natural defensive barrier to the west. Arthur Chichester was granted a castle and 22 townlands in the Lagan Valley area in 1603 and Belfast was given a charter in 1613.<sup>6</sup> The town served primarily a defensive role, being occupied by English and Scottish soldiers. The native Irish had escaped to the surrounding hills but continued to raid the settlement. The internal morphology which developed in the seventeenth and eighteenth centuries was contained within the ramparts, and the town served to exploit the hinterland for its timber and linen. Jones draws this conclusion:

there seems little doubt that the town walls separated the English and Scots planters from the indigenous Irish, who were kept outside - a common feature in other countries where the town is the gift of the invading people.<sup>7</sup>

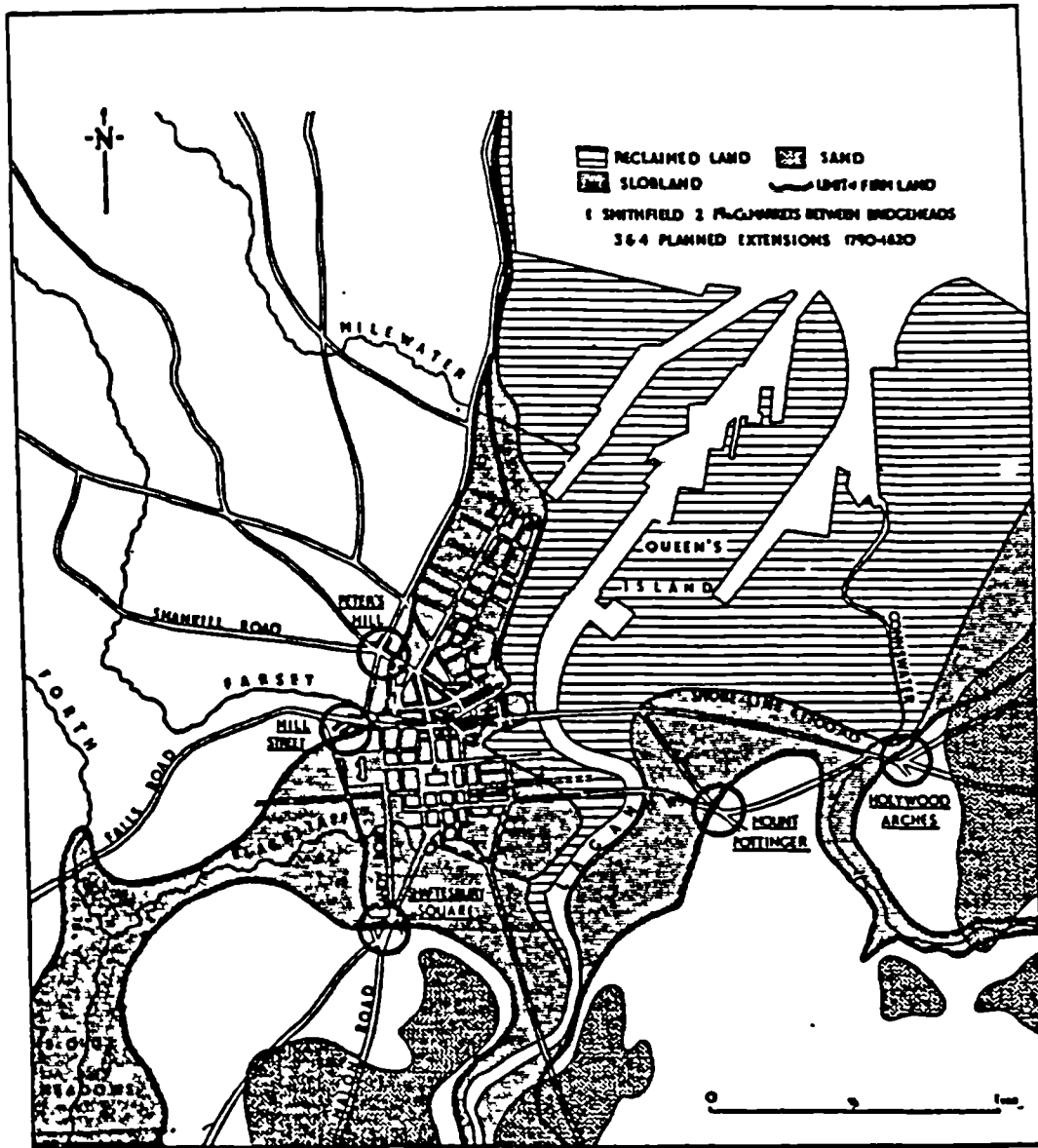
The basis of Belfast's economy by the mid eighteenth century was the export of linen to England and Wales, and a growing colonial trade in Virginian tobacco and West Indian goods. The introduction of steam to cotton spinning in the early nineteenth century changed the whole basis of Belfast's economy. Cotton spinning had been introduced fifty years earlier, but the steam engine altered the structure of the industry from

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<sup>6</sup> E. Estyn Evans, *Belfast: The Site and the City* (Belfast, 1944)

<sup>7</sup> E. Jones, *A Social Geography of Belfast* (Oxford: Oxford University Press, 1960) p.29

Figure 2.1 Belfast 1820



Source: E. Jones, *A Social Geography of Belfast* (Oxford: Oxford University Press, 1960) p. 40

domestic work to large scale factory units. At this stage the town was still contained within the limits of the 'slob land',<sup>8</sup> but there were the beginnings of a poor district to the north of the town, where compact cheap housing intermingled with commercial buildings. A second industrial district was established to the west along the course of the Farset River. The central and southern areas developed as relatively wealthy districts, with wide streets and graceful architecture. The Donegall family estate was at Ormeau, 5 miles to the south of the town, where the extensive grounds had been landscaped into parks and rides. They were typical of the Ulster landowners in that they remained close to the towns so they could promote their trade and participate in local government.

The Victorian era in Belfast saw the demise of the cotton industry following the 1825 trade depression. Linen once again became dominant in the economy and by 1860 there were 30 flax mills in the town, of which 13 were situated in the Shankhill Ward to the north west of the centre.<sup>9</sup> Other industries in 1860 included 13 flour and corn mills, 6 breweries and distilleries and 3 tobacco works. This period also saw the development of the port and the growth in shipbuilding which was to play such a major part in Belfast's economy. Belfast is not a natural harbour, despite its position in the sheltered Belfast Lough. There was no deep water channel suitable for bringing the larger vessels into the town, so they had to be unloaded in the outer waters. A new administrative body was formed in 1839 to rectify this - the Corporation for Preserving and Improving the Port and Harbour of Belfast, which made the first attempt to cut a new channel suitable for bringing in large cargo ships directly to the docks and warehouses. The Corporation was replaced by the Harbour Commissioners in 1847 and they completed the Victoria Channel which was opened by Queen Victoria in 1849. Between 1874 and 1899 10,000 feet of quayage were opened and by 1900 the harbour was handling 2.5 million tons of shipping annually.<sup>10</sup> Belfast's industrial development was due almost entirely to the port. By 1850 the main imports were coal and iron and the exports were food produce - bacon, butter as well as cotton and linen yarn.

Shipbuilding started in the 1850s on the newly reclaimed land of Queens Island. Harland came to Belfast in 1858 from Glasgow, and went into partnership with a Liverpool man named Wolff. Jones suggests that at this time Belfast took over some of Liverpool's shipbuilding as the works on the Mersey were ousted in favour of the more profitable dock facilities.<sup>11</sup> Harland and Wolff grew steadily throughout the century and by 1900 was employing 9,000 men.

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<sup>8</sup> 'Slob land' is the land reclaimed from the lough.

<sup>9</sup> E. Jones, *op.cit.*, p. 41

<sup>10</sup> *Ibid.*, p. 44

<sup>11</sup> *Ibid.*, p. 48

The physical fabric of the town altered considerably in the nineteenth century, due to the increasing population and to the change in ownership structure in the 1840s. The Donegall family was a major landowner in the town until the death of the second Marquis in 1844, which necessitated the sale of a substantial part of the estate to pay off debts. This removed the system of leasing which had proved a deterrent to the expansion of the building stock. The town boundaries were extended in 1854 to include the suburban growth, especially the suburb of Ballymacarrett to the east. The area around the White Linen Hall which had started life as a residential district was now developing into a commercial sector, with houses being converted into shops and offices. The expansion of the town demanded a comprehensive transport network, which was provided in the 1870s when a tramway system was built.

By the end of the nineteenth century Belfast had developed an intricate social network, with an elite group of 300 families who occupied the southern districts like Balmoral Road. The middle classes comprised approximately 6,000 families, and below them came the unskilled dock and linen workers. Gribbon estimates that there was a licensed house for every 328 of Belfast's inhabitants, and as with other towns at this time there was a serious problem with alcohol abuse.<sup>12</sup> Another of the pressing problems was poverty. There was an active measure to reduce the numbers claiming relief from charity, as the names of these persons were displayed in their home districts. The rate of able bodied paupers was therefore only 4% - one of the lowest rates in the United Kingdom.<sup>13</sup>

## 2.2.b Politics and Local Government

Belfast alone among the great towns of Ireland has been a political community almost from its beginning.<sup>14</sup>

Unlike Jones, Budge and O'Leary recognise the impetus behind the early growth of Belfast. They state that the reasoning of Chichester in encouraging the development of the plantations was to strengthen the tiny Protestant minority there against the Catholicism of the native Irish. The same motive was pursued in the early seventeenth century when 40 towns were given borough status, as a way of counteracting the Catholic power base of the county seats. Belfast was a close Borough, meaning that the right to elect two members to parliament was vested in a dozen 'free burgesses' who were members of a self-perpetuating Protestant organisation. The Borough charter of Belfast also placed control of the municipal government in the hands of a 'patron'. Chichester was the first patron, in his capacity as Lord of the castle, and he pre-selected

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<sup>12</sup> S. Gribbon, *Edwardian Belfast* (Belfast: Appletree, 1982), p. 26

<sup>13</sup> *Minutes of the Belfast Board of Guardians*, 1914 p. 33 (P.R.O.N.I. BG vii/A/93)

<sup>14</sup> I. Budge and C. O'Leary, *Belfast: Approach to Crisis* (London: Macmillan, 1973), p. 1

the candidates for the position of Sovereign - the head of the corporation. Chichester's descendants took the title of Lord of Donegall in the Eighteenth century and the system continued. The corporation was manned by friends and retainers of the Donegall family. This to some extent explains the failure of the corporation to govern the town by 1800. It had a meagre financial base established by the charter, consisting of customs and market tolls, but any improvements in the town were not channelled through this body. Instead, a chamber of commerce was founded in 1783 and a charitable society in 1752 which built the poor house in 1768. In 1800 the authority of the corporation was challenged when a Police Act established a committee of 21 and a superior group of 21 commissioners, but excluded the patron or any representative of the corporation. A further Act in 1816 expanded the powers of the police commissioners and fixed the rates for a police tax - on a sliding scale from 6d. for a house with an annual rentable value of £5 up to 1s.6d. for a house above the annual value of £80. A facility to increase the number of bye-laws was also granted.

In the first decades of the nineteenth century the influence of the Donegall family decreased as their financial pressures increased. Belfast was suffering from a local administration in need of reform. The 1835 Royal Commission into the municipal corporations of Ireland found serious defects:

they commented caustically on the weakness of its authority, its limited and ill-defined powers with overlapping jurisdictions and cumbrous machinery, and its failure to discipline the very officials who were frittering away its resources.<sup>15</sup>

The Police Committee was independent of the corporation in some areas, for example appointing scavengers and nightwatchmen, and they also established a magistrates court and planned to pave the streets. However, they had to act together in the matters of contracts for paving, lighting and street cleansing. In 1840 the Municipal Corporations Ireland Act altered the basis of power in Belfast by transferring to the new Borough council the powers and duties of the police committee. The Act also established the £10 voting qualification and a representation system of 2 aldermen and 6 councillors for each of the five wards. The council elected at the 1840 elections was uniformly Conservative - they took all 40 seats. But the foundations to this council are to be found in the 1832 Reform Act which gave Belfast Borough two seats. The formation of political parties within Ireland was closely related to the distribution of the two main religions. The Liberals who supported the Catholics in their United Ireland cause were concentrated in the three southern provinces, the Conservatives who tended to be dominated by the wealthy landowning families like the Donegalls were mainly found in the Ulster province. In Belfast the support for the two parties was fairly equal.

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<sup>15</sup> PP 1842, V, p. 265

A Reform party was started in November 1830, when the reforming zeal of the supporters was directed at the Donegall family's system of patronage. During the same month a Conservative - Orange Lodge organisation appeared in the shape of the Belfast Constitutional Club. By the 1832 election, therefore, the personalities of the two parties had been crystallised. An analysis of the poll book (there was no secret voting) confirms the allegiance of the Catholics to the Liberals and the Orangemen to the Conservatives.

### *John Bates*

The name that is most associated with Belfast politics in the middle decades of the nineteenth century is John Bates. A solicitor, he was a strong Conservative and orchestrated the rise of the Conservative party in the town between the Reform Act and the 1840 Municipal Corporations Act. He set up in each ward a committee to ensure that all Protestants were registered to vote. Through this channel and the Belfast Conservative party he had complete control of all the significant political organisations in the town. Bates became Town Clerk of the new council in 1842 and maintained his control over the Conservatives and the corporation till his downfall in 1854. His only period of weakness was in the general election of 1837 when the Liberals succeeded in returning two members (for the first and last time). However, there was an investigation by a Select Committee into fictitious votes in Ireland and Bates was examined at length on his knowledge of these activities. In 1841 again there were complaints of Tory impersonation and the election was declared void. A subsequent committee report stated that the election had been characterised by 'extensive corruption' and that the state of the register was 'most objectionable'.<sup>16</sup>

Local government during the 1830s had been progressing in other areas with the Irish Poor Law Act of 1838. This established Poor Law unions which were administered by elected local guardians and funded by Poor rates. Their duties were initially to provide poorhouses, but they were later extended to cover the provision of outdoor relief, fever hospitals and dispensaries. Until the 1878 Public Health Act the Poor Law guardians were the main sanitary authorities in the borough. The Police Committee did not surrender to the domination of Bates' new Conservative council till 1844, and after a lengthy appeal through the Queens Bench. The business of improving the condition of life in the town occupied the council for most of the 1840s. They promoted a number of private Bills to obtain the Belfast Improvement Acts of 1845, 1846 and 1847. These Acts were primarily needed to raise money for widening streets, establishing a gas works and draining the Blackstaff river. However, the expenditure sanctioned was exceeded by £84,000 and the Blackstaff project was delayed.

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<sup>16</sup> *Ibid.*, p. 266

The corporation was also criticised for its failure to check the problems arising from the rapid urbanisation and industrialisation of the town. A special sanitary committee which was set up in 1847 because of the threat of a cholera epidemic proved ineffective and short lived. The Conservative domination of the council continued as the Liberals failed to unite and fight their exclusion from the decision making process. They had managed to disrupt the course of the fourth Improvement Act in 1850 but they were powerless to resist the 1852 Belfast Extension Act which increased the municipal area and increased the Poor Law valuation from £156,645 to £250,000.<sup>17</sup>

The downfall of Bates and his corporation came in 1853, when the eccentric John Rea filed a law suit against the mayor and the corporation in the Court of Chancery in Dublin, alleging misuse of funds and illegal borrowing. Rea also accused Bates of fixing the accounts and of charging the corporation £32,000 for his work as town solicitor.<sup>18</sup> The trial in 1855 found the corporation guilty on most charges and discredited Bates. At the annual municipal elections for one third of the council the Liberals took 6 seats. In 1858 a Royal Commission concluded that some of Bates decisions were viable, but that the debt must be reduced to below £200,000 from its level of £269,958 before further projects could be started. They also advised the consolidation of the four main rates, the Police rate, wash-houses rate, Poor rate and the water rate. In the elections of 1861 the Liberals reached a total of 20 members on the council and the first (and only) Liberal mayor was appointed.

The Conservatives made a recovery in 1864 and reduced the Liberal councillors to a group of five. This was in part due to the poor organisational ability of the Liberals. However, there is some evidence that after the chancery suit:

the leading industrialists, merchant princes and professional men looked on the council with some contempt and preferred to serve in the chamber of commerce or (those with specialised interests) on the Harbour Board.<sup>19</sup>

Budge and O'Leary note that in 1865 there was no shipping representative on the council, which can be taken as an indication of the council's impotent status in the eyes of the town's industrial sector.<sup>20</sup> It would be interesting to make a full analysis of the socio-economic profiles of the councillors who served Belfast during the nineteenth century. This would undoubtedly confirm the popular images of the composition of the council at that time. However, such a study would be a massive project in its own right, which would involve tracing all the councillors through trade directories, wills and other anecdotal material. Therefore it will not be considered here, but may form

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<sup>17</sup> I. Budge and C. O'Leary, *op.cit.*, p. 60

<sup>18</sup> *Ibid.*, p. 60

<sup>19</sup> *Ibid.*, p. 64

<sup>20</sup> *Ibid.*, p. 65

part of a future study. The work of Budge and O'Leary in this area is sufficient to show the general trends within the council.

Sectarianism pervaded most of the public bodies in Belfast. Only a few of the police men were not Protestant, and the anti-Catholic clergymen were becoming involved in Conservative politics. In the early 1860s the Conservative magistrates put little effort into attempts to restrain protestant rioters. The chairman of the police committee, Samuel Black, blatantly stated that there should be a Conservative dominated council because the wealth and property of Belfast was owned by the Protestants.<sup>21</sup> In 1864, a new national police force - the Irish Constabulary - was formed to eradicate the religious bias of the old Belfast Police Force. This new police force was mainly Catholic and thus did little to reduce the sectarian violence which frequently occurred in the town.

The 1868 Reform Act increased the Belfast electorate by approximately 7,000. The election in this year was therefore an intensely debated one. The Liberals succeeded in returning their last M.P. This election was fought primarily on municipal issues, for example, the salary of the mayor, which at £1,000 per annum was double that of Edinburgh's mayor. Other issues were the rate increases and the failure to drain the Blackstaff river. The riots continued into the 1870s, with a major conflict in August 1872. The traditional pattern re-occurred, with the Catholics and Protestants taunting one another through parades and meetings. The 1886 riots involved sporadic violence for nearly four months and the damage to property was estimated at £90,000. The riots nearly always were restricted to the same part of the town, and the intensity of the conflicts increased throughout the century. As the town developed distinct religious enclaves, the sites for the confrontation were imbued with a religious sentimentality. The routes for the processions were woven into the sectarian history of Belfast. The timing of the riots and the contemporary literature does not support the theory that it was an expression of territoriality over jobs. There is no correlation between the sequence of riots and the economic depressions, in fact Belfast was relatively untroubled by unemployment. Budge and O'Leary show that employment for men remained relatively constant from 1875 till the 1900s and that the real value of wages increased by about 200% in a time of falling prices.<sup>22</sup> In 1864, a year of rioting, the port was scarcely able to handle the amount of work that the booming economy wanted to pass through it. Wages were the highest in Ireland and were comparable to the rates paid in English industrial towns. The explanation for the riots must remain, therefore, religious, and in part be due to the ascendancy of the Orange Lodges in Belfast.

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<sup>21</sup> PP 1865, XXVIII, p. 11, Report of the Commissioners of Inquiry 1864.

<sup>22</sup> I. Budge and C. O'Leary., *op.cit.*, p. 107



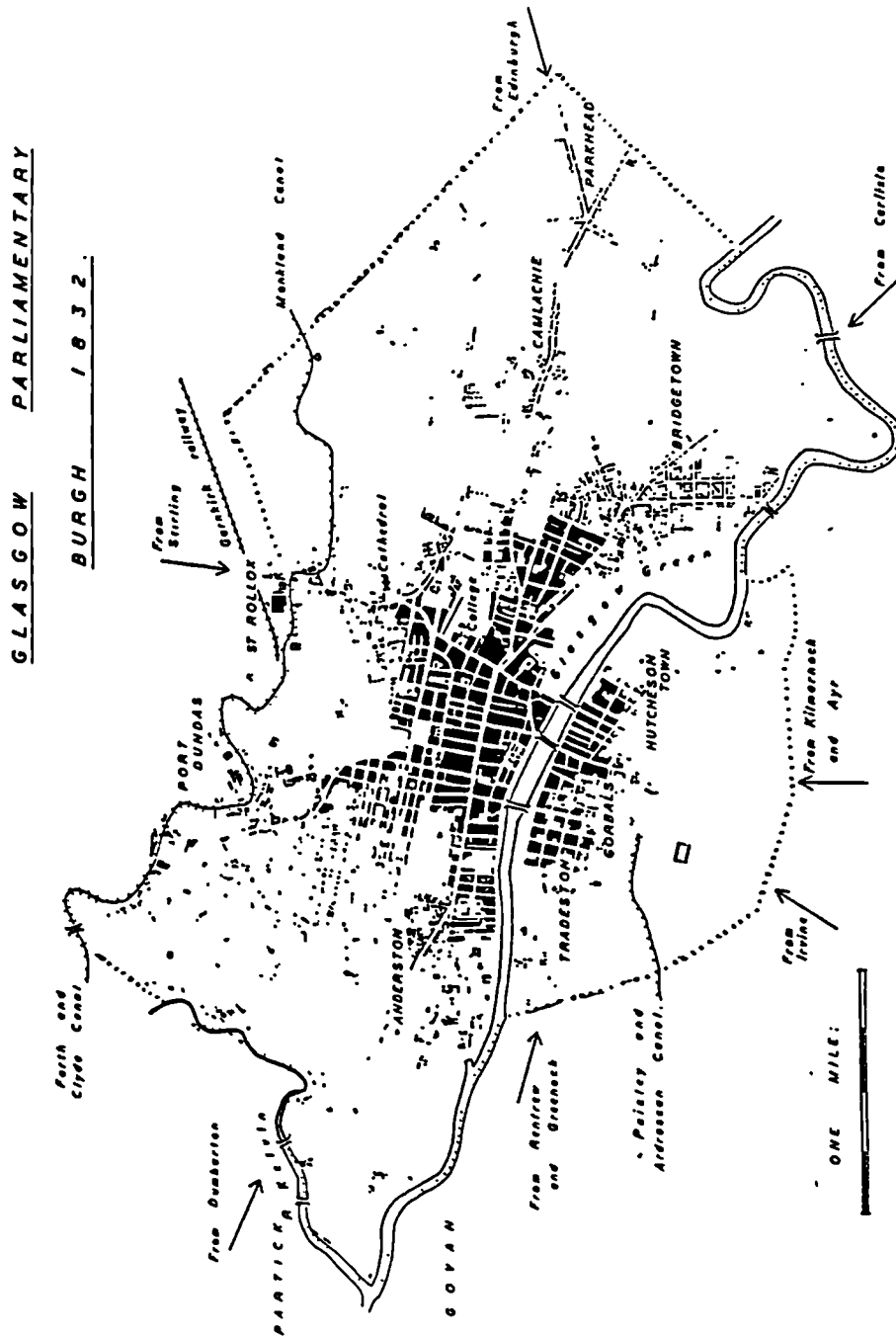
The last three decades of the nineteenth century saw the resignation of the Liberals to their failure in both municipal and national government, the continued domination of the Conservatives and the rise of the Home Rule campaign. The Irish Home Rule Association was formed in 1870 and effectively split the Liberals into two camps who were divided over Gladstone's support for it. National concerns thus overshadowed the local issues for Belfast. The Franchise Act of 1884 quadrupled the Irish electorate and the Redistribution of Seats Act of 1885 radically changed the geographical base of power in Belfast, as it created four new constituencies, one of which was coterminous with the Catholic "ghetto" of the Falls Road. The 1885 election results indicated Belfast's strong links with the British mainland. The Conservative-Orange faction won 3 of the 4 seats. However, within Ireland as a whole, Parnell's Home Rule party won every seat in the provinces of Munster, Leinster and Connaught and they had the majority of seats in Ulster. It was in the face of this massive opposition that the Ulster Conservatives and the Orangemen formed the Unionist Parliamentary Party. From 1886, Unionist Clubs spread throughout Ulster. The Parliamentary elections in Belfast became predictable from this point and interest in them declined. In the 1895 elections all four seats were uncontested.

In municipal government in the late nineteenth century attention was focused on the utilities. A tramway company had been formed in 1872 and the corporation finally obtained an Act to purchase it in 1904. The gas supply to the city was undertaken by the Belfast Gas Company, incorporated in 1822 and one of the oldest in the United Kingdom. The corporation obtained an Act to buy out this company in 1846 under Bates' leadership, but the transaction was not achieved till 1874. From its earliest days, electricity was always a municipal concern. The corporation started to supply Belfast in 1895. The issue of municipal household suffrage was raised in the 1880s and a Bill was passed in 1887 mainly due to the pressure the Nationalists organised at Westminster. The 1895 Bill to extend the municipal boundary to the Parliamentary one and to redistribute the wards within the city (the status of city had been granted in 1888) was opposed strongly by the Catholics. They had only had 3 Councillors in 50 years despite forming 25% of the population of Belfast. Their determination won in the end and the boundary lines were altered to ensure that two wards (Falls and Smithfield) had a permanent Catholic majority.<sup>23</sup> The Belfast Corporation Act of 1896 extended the boundary and increased the electorate from 39,603 to 47,294. The new wards returned a total of 60 councillors in the November 1897 elections - 33 Conservatives, 5 Liberal-Unionists, 6 Labour, 8 Catholic Association and 8 Independents. The crucial committee positions in the council continued to be dominated by the Conservatives, although the Catholic Association allied with Labour to try to increase their influence. In 1905 a new

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<sup>23</sup> *Ibid.*, p. 115

Figure 2.2 Glasgow 1832



Source: D. Stevenson, *Municipal Glasgow: its Evolution and Enterprises* (Glasgow: Glasgow Corporation, 1914)

pressure group was formed - The Citizens' Association - which was non-sectarian and aimed at bringing the corporation to account for its expenditure on lavish schemes like the Town Hall, which cost £320,000.

Some general observations may be made about the political scene in Belfast at the end of the nineteenth century. Issues which had been hotly debated and politicised in other sectarian towns like Liverpool and Glasgow, such as education and municipal housing had not raised the same degree of interest in Belfast. The growth of the population happened comparatively late and after the introduction of bye-laws on house design and quality. Land was cheap and there was a good supply of building materials. The education issue focussed on the lack of local control and the domination of church control, not on the subject of multi-denominational education as in Liverpool.

## 2.3 Glasgow

### 2.3.a Geography and Economy

Glasgow is situated on the River Clyde, 14 miles up from the estuary. This position gives an indication of the initial reason for its settlement, as it was an easy point at which the river could be crossed. The valley in which Glasgow lies was contoured during the ice age and the drumlins which remain are still obvious in the city despite the camouflage provided by the buildings. Glasgow was identified as a Roman Settlement and in 540 A.D. St. Mungo established his church in the area, making Glasgow an important ecclesiastical centre. Glasgow received its first charter in the twelfth century and has continued to grow since then. A university was founded in 1451; in 1492 Glasgow was given the status of an archbishopric, and it became a royal burgh in 1611. Like Liverpool and Belfast, the role of the city as a port has been important in stimulating overseas trade and developing local industries.

The Act of Union of 1707 opened up new markets for Glasgow. As well as their traditional trading partners in France and Holland, new markets were created in America - and a tobacco trade was established with the states of Maryland, Virginia and the Carolinas. The tobacco trade was in direct competition with English ports but Glasgow had the advantage in the days of sailing ships as it could save four weeks on the voyage in comparison with ships departing from London. Glasgow also developed its sugar refining and soap making industries.<sup>24</sup> The eighteenth century saw the development of Glasgow as an entrepot - tobacco imported from America was immediately re-shipped to European countries. The American Revolution which began

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<sup>24</sup> J. Cunnison and J.B.S. Gilfillan (eds.), *Glasgow* (Glasgow: Collins, 1958), p. 96

in 1775 was disastrous for Glasgow as it halted the tobacco trade, but many merchants were able to establish new empires. The business community in the town was well provided for. A Chamber of Commerce and Manufactories, the first in Britain, was established in Glasgow in 1783 and a strong financial centre developed in the late eighteenth and early nineteenth centuries. An idea of the growth of the economy of the city can be gauged from the customs duties. In 1772 they were approximately £40,000 by 1847 they had risen to £630,000.<sup>25</sup>

By the late eighteenth century Glasgow had begun to expand to the south of the River Clyde, a barrier which had channelled the growth of the city to the west for the previous 600 years. The removal of the richer inhabitants from the centre of Glasgow did not happen in an organised way as it had done in Edinburgh, but when the oldest parts of the city, around the High Street and Trongate, began to lose their residential status, the upper classes moved to the west and across the river to the new suburb of the Gorbals. By 1800 the Saltmarket area had become a slum quarter, characterised by the division of formerly grand houses and the influx of the poorer classes.<sup>26</sup> The growth of Glasgow had been facilitated by the building of a number of bridges. The earliest was the fourteenth century stone bridge and by 1900 there were 11 bridges and 3 tunnels to bypass the river Clyde.<sup>27</sup>

When the tobacco trade declined Glasgow replaced it with another American dependency - cotton. The timing of the rise in the cotton industry was fortunate for the city, as there was a ready supply of capital and labour which had been made redundant after the impact of the American revolution. By 1854 there were 92 cotton factories in Glasgow and the industry employed a workforce of 24,000. Cotton imports in 1775 had been only 503 bags, but by 1807 over 12 million lbs was imported per annum.<sup>28</sup> The increasing imports not just of cotton but of other raw materials necessitated a sudden and dramatic improvement in the port facilities. Thomas Telford submitted a plan in 1806 to the Clyde Navigation Trustees, proposing new banks for the river to channel the scouring power and to straighten out some of the awkward bends which hindered shipping. However, his plan was not adopted and in the 1830s it was common for ships to have to wait for 5 to 6 days to obtain a berth to unload their goods. The shortage of quays meant that ships had to be tied up alongside each other in tiers 7 or 8 vessels deep.<sup>29</sup> There was some improvement in the internal transport network in the first half of the nineteenth century, as canals were cut to transport coal and iron ore to the expanding industrial suburbs of Glasgow. In 1831 over 200,000

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<sup>25</sup> J. Pagan, *Sketch of the History of Glasgow* (1847), p. 37

<sup>26</sup> J. Cunnison and J.B.S. Gilfillan, *op.cit.*, p. 37

<sup>27</sup> *Ibid.*, p. 42

<sup>28</sup> A. Gibb, *Glasgow: The Making of a Modern City* (Glasgow: Croom Helm, 1983), p. 82

<sup>29</sup> *Ibid.*, p.84

tons of coal, 9,000 tons of iron ore and 25,000 passengers were transported on the Monkland canal.

### *Industrial diversification*

The expansion of the cotton industry in Glasgow stimulated the associated growth of a chemical industry to supply the dyestuffs and bleaches. In the 1840s the St Rollox chemical works were the largest in Europe. The cotton industry also required machinery, in particular steam engines. By 1840 there were 14 firms in the city making steam engines or mill machinery. Gibb has identified four main concentrations of industry within the city. First, in the east and around the villages of Calton and Bridgeton where the cotton mills were situated. Secondly, in the north of the city on the line of the Monklands, Forth and Clyde canals there were iron foundries, chemical works and glassworks. Thirdly, there was a concentration on the north bank of the Clyde, west of Broomilaw of iron foundries and engineering firms. Lastly, there was a growing industrial area to the south of the river in Hutchesontown and Tradeston. Within the city the textile firms were fighting over the newly vacant properties around George Square which the upwardly mobile classes had deserted.

With the American Civil War (1861-1875) Glasgow's biased economic structure was disrupted for a second time. The dependency on cotton had come to resemble the earlier dependency on tobacco. A new base for the economy was found in the iron industry. Roger suggests that the reason for the narrow employment base and the constrained growth and diversification in the economy of Glasgow was due to the low wages which encouraged continued labour intensive production methods.<sup>30</sup> Checkland, however, links the change in emphasis in the economy to the ready accessibility of coal and iron ore in the region and the marine demands of Glasgow - shipbuilding and engineering. He therefore sees Glasgow as:

a Liverpool and Manchester together - a port, with a coal and iron hinterland, but also with textiles (especially cotton) and heavy chemicals arising originally from the needs of the textiles.<sup>31</sup>

By 1850 90% of Britain's pig iron came from Scotland, shipped out from the Clyde. There were many uses for the steel. The iron hulls of ships, the railways, and heavy engineering - the steam engines and railway locomotives. The shipbuilding industry demanded an improvement in the quays and docks of the Clyde. Govan became the centre for the shipyards and new docks were opened in the 1870s and 1880s. The river Clyde was thus transformed into:

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<sup>30</sup> R. Roger, 'Employment and Wages in Scottish Cities 1841-1914' in G. Gordon (ed.), *Perspectives of the Scottish City* (Aberdeen: Aberdeen University Press, 1976), p. 53

<sup>31</sup> S. Checkland, *The Upas Tree; Glasgow 1875-1975* (Glasgow: Glasgow University Press, 1976), p. 7

a long ship canal ... The Clyde was at last a great river and Glasgow one of the world's great ports.<sup>32</sup>

The last quarter of the nineteenth century was one of success for Glasgow. Some commentators have identified a certain degree of smugness and complacency in the attitudes of Glaswegians at this time.<sup>33</sup> They were proud of their achievements, especially in the shipbuilding and the expression 'Clydebuilt' was known worldwide. Glasgow was given an opportunity to display her successes when she held the International Exhibitions of 1888 and 1901. The city also had developed a reputation for the excellence of its architects, and in the art world the Glasgow school of painters had international recognition. It was only in the last decade of the century that the contraction of certain sections of the world economy were felt in Glasgow, despite the end of the 'Great Depression'. However, the rising defence expenditure cushioned the shipbuilding and engineering firms from this trend, and eased the decline in merchant navy orders.

When the population figures for Glasgow are considered the rapid growth of the city which occurred in the nineteenth century can be appreciated. In 1801 the census population was 77,000. By the close of the century it had risen to over 762,000. Glasgow's population had increased 6 times between 1801 and 1871 while that of Scotland had doubled. The growth of the population had been due to in-migration and the extensions of the boundary. These will be discussed in the section on the politics of the town. The first main migration stream to Glasgow can be identified in the 1870s when the processes of agricultural improvement in the Lowlands of Scotland forced many rural families to come to the city in search of work. A second group of migrants came from the Highlands at the beginning of the nineteenth century following the collapse of the rural economy. The most significant migration stream in terms of numbers of migrants and the impact they had on the culture and economy of the city were the Irish who came in a mass migration movement in the 1830s and 1840s. They were similar to the Scottish migrants in that they had been pushed from the land because of crop failure. Traditionally, Irish seasonal workers had come to Scotland to help with the harvests. Now they came with a view to staying permanently. By 1841 the migrants constituted between 40% and 60% of the population of Glasgow, with a particular concentration in the St. Mary Tron area of the city.<sup>34</sup> Between December 1847 and February 1848 approximately 43,000 Irish migrants arrived in Glasgow.<sup>35</sup> As in Liverpool the Irish migrants came from the lower classes and a large proportion of them could not find work to support themselves or their families. Consequently the

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<sup>32</sup> A. Gibb, *op.cit.*, p. 118

<sup>33</sup> S. Checkland, *op.cit.*, p. 2

<sup>34</sup> A. Gibb, *op.cit.*, p. 107

<sup>35</sup> C.A. Oakely, *The Second City* (Glasgow: Blackie, 1946), p. 70

pressure on the relief offered by the city was great. In the 1830s it was estimated that 18,500 persons were receiving relief.<sup>36</sup> The Irish came from all parts of Ireland. The Glaswegians preferred the Ulster Protestants who had a good reputation for their hard work, but a large number came from the Catholic provinces and as a reflection of this in 1878 the Pope restored the Scottish Hierarchy, which led to protests from the fiercely Protestant majority in the city.

### 2.3.b Politics and Local Government

Glasgow's municipal government at the start of the nineteenth century was ripe for reform. The boundaries of the city had remained unaltered since 1613. The Royalty of Glasgow Extension Act of 1800 was the first in a series of three important nineteenth century Acts to increase the area of the municipality.<sup>37</sup> The 1833 Burgh Reform Act ended the old 'close system' of council elections which had operated since 1690 and it raised the municipal franchise from 5,506 to approximately 9,000 as the registration requirements were brought into line with those for the parliamentary elections. The population of the city at this time was over 202,400. This highlights the limited nature of the reforms. The 1833 Act created 5 wards with an allocation of 6 councillors per ward. There were also two other members of the council - the Dean of Guild and the Deacon Convenor of the Trades House. They are tokens of the real seats of power in the city before 1833 - the Merchants' and Trades' Houses. The councillors in the new council of 1833 elected a smaller management team, consisting of the Lord Provost, five magistrates and other permanent officials.

#### *Municipal apathy*

The 1846 Act which enlarged the area of the city also enlarged the council to 50 members to represent the 16 wards. This election gives an indication of the interest that Glaswegians showed in municipal politics. The poll was 39% and 11 of the 16 wards were uncontested. The main issue was the assessment of the Poor Rate and national politics did not enter into the debate. Candidates were selected on individual merit, not affiliation to a national political party. It was not until the 1870s that organised party pressure groups came into municipal government in Glasgow.<sup>38</sup> Another surprising omission from municipal politics in Glasgow is summarised by Smith:

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<sup>36</sup> *Ibid.*, p. 108

<sup>37</sup> Acts of 1846 and 1891. By 1938 the area of Glasgow had increased to 22 times larger than its 1832 limits.

<sup>38</sup> J. Cunnison and J.B.S. Gilfillan, *op.cit.*, p. 424

Glasgow, as much as Liverpool should have been dominated by sectarianism, ghettos and Tammany Hall. However, Glasgow's municipal government did not develop in Tammany Hall style.<sup>39</sup>

Checkland suggests that as in Belfast, the business of civic government was left to the 'lesser bourgeoisie' while the more powerful merchants confined their attention to the Chamber of Commerce and social concerns.<sup>40</sup>

The 1872 elections only managed to encourage 15,102 votes despite an electorate of over 53,000. There were contests in only 7 of the 16 wards, and the main issue was temperance, not municipal spending or a similarly contentious issue which would have incited the electorate to action in Liverpool or Belfast. In 1891 the city's boundaries were extended once more and the wards re-distributed into 25, with the number of councillors increased to 77. In the elections of the same year the turnout was 29.8% of an electorate of 113,720. There were two further extensions to the municipal area in 1896 and 1899, and in the 1900 elections the enthusiasm for municipal affairs was as 'great' as it had been in 1833 - in 13 of the 25 wards the councillors were returned un-opposed. The impression given by the contemporary commentators is that this was not an unusual state of affairs, and no comparisons seem to have been made with other large towns and cities. It is difficult therefore, to present any hypothesis to explain this lack of interest in local elections. Possibly the active status of the Parochial Boards took some of the attention away from municipal affairs. The four Glasgow Parochial Boards which were established by the 1845 Poor Law Amendment (Scotland) Act covered the parishes of City, Barony, Gorbals and Govan. Through their progressive accretion of medical and public health services they were responsible for the collection and expenditure of substantial amounts of money. Whereas in English towns and cities the parochial unit gradually acceded to the unification of urban services within one administrative system, in Scotland the duties of the Boards ensured that they remained as influential organs until late in the nineteenth century.

The picture created so far of Glasgow's municipal activities is one of lethargy and disinterest. But the impression belies the actual mood of the corporation and the individual councillors. The support from the electorate may not have been great but the councillors were diligent in their work and some talented men found their opportunity in the wide ranging schemes the corporation pursued. Glasgow corporation was a showpiece of municipal achievement. There is also a suggestion, however, of civic authoritarianism. In the *Scottish Law Review* of 1905 the corporation was labelled as 'the oppressor of the west' and charged with 'regarding the Imperial Parliament as a

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<sup>39</sup> J. Smith 'Class Skill and Sectarianism in Glasgow and Liverpool 1880-1914' in R.J. Morris (ed.), *Class Power and Social Structure in 19th Century British Towns* (Leicester: Leicester University Press, 1986), p. 186

<sup>40</sup> S. Checkland, *op.cit.*, p. 14



means of registering its decrees'.<sup>41</sup> The corporation had however, made considerable progress in their quest for a better urban environment. They had been the first city to undertake such a massive water scheme as Loch Katrine, the City Improvement Act had been used to clear some of the worst slums (although its cost at £1,250,000 lost Provost Blackie his seat on the council), and the tramway network from the start was under the control of the corporation and therefore more receptive to planning for the growth of the city.

Glasgow in the nineteenth century was a Liberal city. It had been a leading supporter of the calls for the reform of the parliamentary franchise in the 1820s, and in 1837, following the disappointment over the 1832 Reform Act, there was a mass meeting to support the peoples' charter. A Chartist movement persisted in Glasgow till 1840, when they discontinued financial support for their representative in the 'alternative Parliament'. The 1830s were uneasy times in Britain, and Glasgow reflected the current mood of the people. In 1832 when Glasgow was given separate representation in the British Parliament, the electorate of the city was only 5% of the population. The Boundary Commissioners in 1832 also split the old Burgh of Glasgow, and the Parliamentary and municipal boundaries were divorced till 1846. The 1832 Act had brought some changes to Glasgow. The city now had two MPs who were elected by the £10 householders. Before this delegates from the self-selecting town council had a partial say in the election of a representative for the four Burghs. In 1868 a further modification was made to the system of representation, and Glasgow was allocated three MPs in the hope that minority groups would be catered for, as the electorate could still only cast two votes each. In 1885 the single constituency was abolished and seven new divisions created.

1832 to 1885 was a period of Liberal supremacy in Glasgow. Their rule was broken only once when in 1874, following the minority representation alteration of the 1868 act, a Conservative MP was returned. Whitelaw was the only Conservative in an election in which six Liberals stood, and he obtained 14,000 of the 75,000 votes available. This was also the year that secret voting was introduced, so it is not possible to attribute the Conservative victory to tactical voting by the Liberals (using only one of their two votes) or to genuine Conservative support in the city. However, in the 1885 election, at a time when the Liberals were giving serious thought to the Irish Home Rule question, and following the division of the city into seven wards, the Conservatives took 43% of the votes, but they failed to gain even one seat. The divisions were not extreme in their political views and there were no Liberal strongholds. Only one candidate scored 60% of a poll before 1914.<sup>42</sup>

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<sup>41</sup> *Ibid.*, p. 29

<sup>42</sup> J. Cunnison and J.B.S. Gilfillan, *op.cit.*, p. 444

In the 1890s there was a revival of the trade unionism that had been so prevalent in Glasgow in the 1850s. A Trades Council had been formed in the city in 1858, and it had been successful in organising a number of local strikes. In some of Glasgow's occupations, though, there was little demand for a powerful trade union. The shipbuilding and engineering workers were relatively well paid due to the high levels of skill their jobs required, and their professions were characterised by stable, long term employment trends. This is in sharp contrast to the dock workers and porters in Liverpool who had no job security and who suffered low wages for most of the nineteenth century. Glasgow workers were loyal to the firms they worked for, as they were kept on despite periods of little work. Membership of trade unions tended to be low, with workers only signing on during periods of strikes. In the 1890s there were, however, some serious disputes on Clydeside. There was a railway strike in 1890 and an engineering lock-out in 1897 which united the Clyde Shipbuilders and Engineers Association against the unions. Generally, Glasgow did not experience the same degree of labour unrest that was found in other major employment centres at the end of the nineteenth century. In politics, too, the majority of the working class men, when they received the vote, continued to support the Liberals, until the late development of the Independent Labour Party in the city in the 1900s there was no differentiation of working class politics on religious grounds as there had been in Liverpool and Belfast.

## 2.4 Liverpool

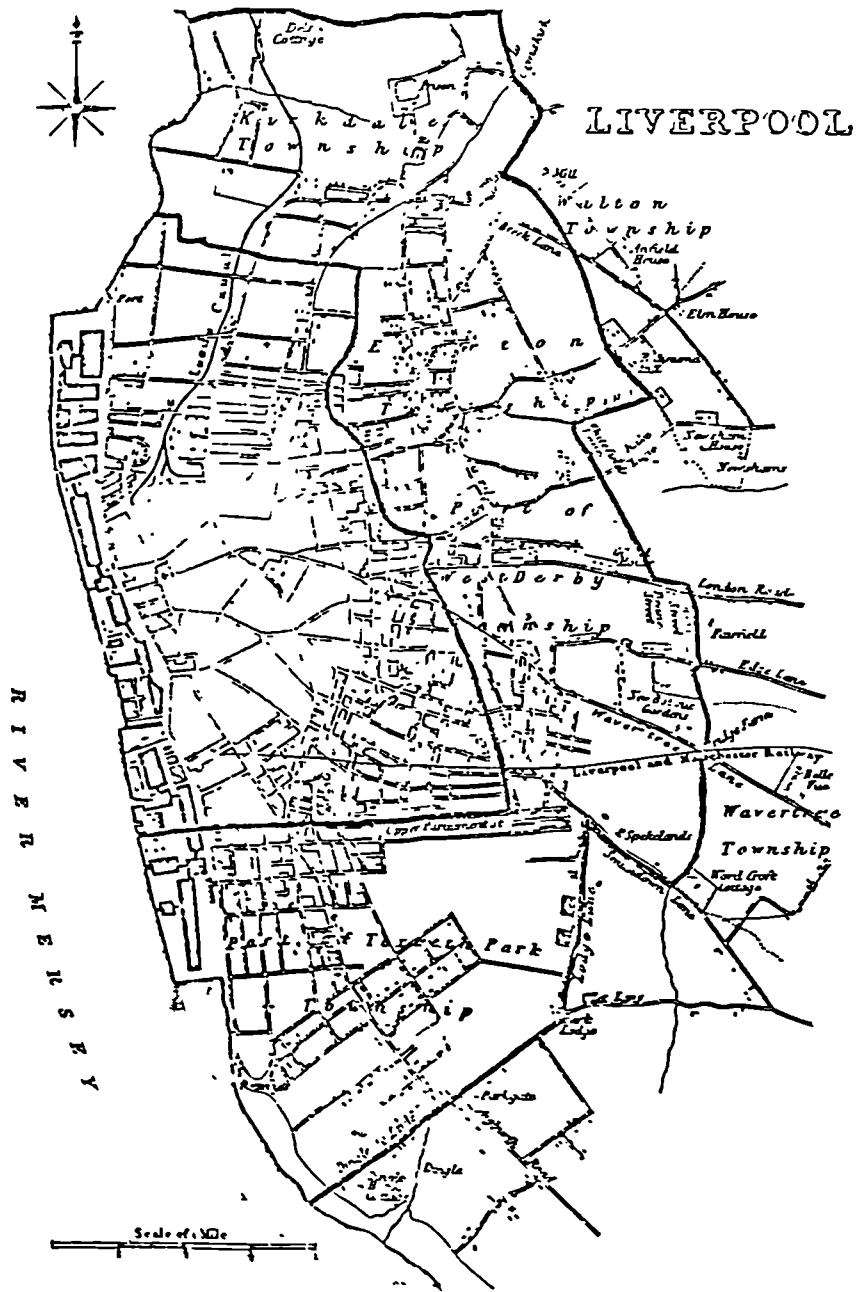
### 2.4.a Geography and Economy

Liverpool was created as a Royal Borough in 1207 by King John to provide a port through which he could channel his war with Ireland. The subsequent growth of the settlement was slow, mainly concentrating on the Irish trade until the development of the 'New World' opportunities in the sixteenth century. In 1700 Liverpool was England's third port but in terms of population size it was only rated 20th. By 1800 it was the second port and it was the largest provincial town with a population of 80,000.<sup>43</sup> However, like Belfast, Liverpool did not have the attributes of a natural port. There was no shelter, such as that offered by the rival River Dee, and the 'pool' was an area cut off from the estuary by a narrow strip of land on which the town was situated. These problems were overcome by the creation of docks and wharfs and by the eighteenth century the River Dee had ceased to be used by shipping as the draughts of the new vessels was too great to use it. The site of Liverpool is actually part of the Lancashire plain, and it benefitted from the slight slope in the oldest part of the town.

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<sup>43</sup> J. Langton and P. Laxton, 'Parish Registers and Urban Structure: the Example of Late 18th Century Liverpool', *Urban History Yearbook* (1978) p.74-84

Figure 2.3 Liverpool 1849



This facilitated drainage - something which Belfast and Glasgow had continual problems with. By the beginning of the nineteenth century, the basis of trade in the town was salt and coal.<sup>44</sup> This in turn led to the development of the chemicals industry. The industrial sector of the economy was inextricably linked to the activities of the port. This was reflected in the employment analysis and the revenue split.

The growth of Liverpool was not only dependent on the fluctuations in the export market, but also on the prosperity of the English industrial regions which supplied the goods that the port handled. The improvement of communications internally was therefore of paramount importance to Liverpool. The Bridgewater canal opened in 1767 as the first long distance canal, which linked Liverpool and Manchester, and in 1777 the Grand Trunk canal linked Liverpool and Birmingham. During the eighteenth century Liverpool's trade was also biased in favour of the slave trade, having 85% of the market and representing an average annual return of £1.5 million.<sup>45</sup> This conveniently complemented the trade links with Africa and the West Indies. When slavery was abolished in 1807, the repercussions in Liverpool were luckily not as severe as had been feared. Liverpool had a virtual monopoly in the cotton trade as well, between 1820 and 1850 the port handled 80% of Britain's raw cotton imports.

The value of the exports handled by the port increased dramatically as the American trade was consolidated in the first half of the nineteenth century. In 1839 they were valued at £25 million, and by 1857 they had risen in value to £65 million. In 1900 Liverpool's docks covered 1,600 acres and 35.5 miles of lineal quay space. The dock estate represented £42 million capital. There was not however, any corresponding growth in local industry. The social structure of the town thus differed from that of contemporary provincial towns like Manchester or Leeds. In Liverpool the elite were the merchants. They made little use of the local workforce except indirectly through portage and shipping firms, so there was no opportunity for class animosity to form. The lack of an industrial sector had implications for the inhabitants of Liverpool. Employment associated with the docks was erratic. Workers were hired on a daily basis and the conditions were dangerous. Employment for the skilled and white collar workers was always available as it was tied to the prosperity of the port. Liverpool had major banking, insurance and warehouse activities. Shipbuilding and repair work also provided many jobs. In 1870 there were 17,400 people who classed themselves as 'clerks'. The tradesmen were important in Liverpool as a social and political group. The term 'tradesman' is rather vague, it encompasses wholesalers, shopkeepers, builders

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<sup>44</sup> F.E. Hyde 'The Growth of Liverpool's Trade 1750-1950' in W.A. Smith, *A Scientific Survey of Merseyside* (Liverpool: Liverpool University Press, 1953)

<sup>45</sup> F. Vigier, *Change and Apathy: Liverpool and Manchester during the Industrial Revolution* (Cambridge: M.I.T, 1970), p. 64

and manufacturers. As the nineteenth century progressed they played an important and increasingly active part in the government of the town.

### *The Irish and the poor*

The lowest class in Liverpool were identified by their contemporaries as the Irish. Mass immigration began in the 1840s and they became the scapegoat for many of Liverpool's social and economic problems. Before 1850 over 500,000 Irish had entered Liverpool. There were successful Irish immigrants, but it must be recognised that the majority automatically fell into the poor category. In 1844 Engels found in Liverpool that:

a full fifth of the population, more than 45,000 human beings, living in narrow, dark, damp and badly ventilated cellar dwellings of which there are 7,862 in the city.<sup>46</sup>

The Irish came to Liverpool because of the opportunities it offered and because it was comparatively better than the rural poverty they were leaving behind. Some of them intended Liverpool to be a 'pit-stop' in a journey to another part of the country or world, but many decided to stay.

If the internal structure of Liverpool is considered, two immediate observations can be made about the nineteenth century experience. First, the rapid expansion in the urban area from the original core around the present site of Pier Head, and secondly, the gradual segregation of the town by class and ethnicity - although in the case of the Irish these criterion were virtually synonymous.<sup>47</sup> As the new docks were built moving outwards from the Castle Street area, the expanding population was accommodated in dockside estates, quickly established by the speculative builder. In 1775 the Earl of Sefton (the Molyneux family) developed part of his estate in Toxteth for housing, anticipating the formation of a new middle class district. Unfortunately, his new estate rapidly lost its attraction to the middle classes as the area was infiltrated by industries linked to the southern extension of the docks, in particular iron foundries and food processing plants. The Toxteth area became the Irish 'ghetto' and contained approximately 30% of Liverpool's paupers.<sup>48</sup> Toxteth Park's population increased 185% between the 1801 and the 1811 censuses. This reflected the industrialisation of the area and the supply of cheap accommodation for the unskilled workforce close to their employment.

A more statistical way in which the socio-economic residential patterns of Liverpool can be identified is to use the data available on housing. From a number of

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<sup>46</sup> F. Engels, *The Condition of the Working Class in England in 1844* (London: Methuen, 1920)

<sup>47</sup> C.G. Pooley, 'The Residential Segregation of Migrant Communities in Mid-Victorian Liverpool', *Trans. Instit. British Geographers* (1978), p. 378

<sup>48</sup> F. Vigier, *op.cit.*, p. 67

surveys conducted in the 1840s it is possible to determine the percentage of the population living in cellars or courts in urban sub-districts.<sup>49</sup> Duncan's evidence to the Commissioners Inquiring into the State of Large Towns and Populous Districts is presented in Table 2.1. This information can be used as a proxy for class data, as the income levels of the poor restricted their choice of accommodation to these insanitary and overcrowded areas. Thus Treble has been able to classify districts of the city according to their predominant housing stock. The residences of the poorest were in the central and dockside wards such as Vauxhall, Exchange, Lime Street and St. Peters. Newer working class areas were developed, as shown above, on the margins of the old urban area in the townships of Everton, Kirkdale, Toxteth and West Derby.<sup>50</sup> Of course no districts were homogenous in their socio-economic population. Even within the upper class districts there were families living in cellars and, from the 1850's increasingly in 'made-down' houses as the elite moved upwards and outwards to areas like Sefton Park. Distinctly middle class areas which had emerged by the 1840s, such as Abercromby Square and Rodney Street remain as examples of the comparative luxury the merchants and tradesmen enjoyed. This geographical differentiation of classes had important implications for the political representation of the town, and this will be considered in a separate section. However, as White reminds us, Liverpool by our standards was a small settlement, and the ignorance of the social classes could not be perpetuated when they were living in close proximity to one another.

Poverty was evident everywhere in Liverpool, but more specifically the connection with the location of the Irish population within the town was very strong. Vauxhall and Exchange Wards, which contained areas like the notorious Scotland Road were almost totally populated by the poorest poor - most of them recent Irish immigrants who had problems entering the already overcrowded employment market. Continuous efforts had been made by the Poor Law guardians since their formation in the reign of Elizabeth I to relieve the conditions of the poor in Liverpool. Throughout the eighteenth century they had levied a rate on the property owners to provide money to support workhouses and outdoor relief. The collection and distribution of this rate was controlled by the parish authorities and this authority came to rival that of the council in the town. By 1795 there were 1200 'inmates' in the Liverpool workhouse. In 1800 the amount spent on relief was £33,000 and a rate of 3s in the pound was levied. Vigier estimated that in 1800 the percentage of the population claiming relief of

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<sup>49</sup> See for example Dr. Duncan's survey presented to the Royal Commission on the State of Large Towns and Populous Districts (First Report vol1 PP 1844, pp.155-157. This estimated the population of Vauxhall Ward which lived in courts and cellars as 56.7%.

<sup>50</sup> J.H. Treble, 'Liverpool Working Class Housing' in S.D. Chapman (ed) *The History of Working Class Housing* (London, 1971)

some kind was 34%.<sup>51</sup> Instead of trying to solve the basic problems which had initiated the poverty trap, Liverpool was content to formalise a charity and relief system. However, this conformed to the behaviour of most British towns and cities during the nineteenth century, at least until the beginnings of the 'Welfare State'. The poor were thus accepted as a given and permanent element in the social structure.<sup>52</sup> In 1821 the New Select Vestry Act was passed which made the vestry more accountable to the ratepayers. This Act established new policies concerning the deserving and undeserving poor and to some extent pre-empted the 1834 Poor Law Amendment Act which came in to force in the north of England in 1837.

#### 2.4.b Politics and Local Government

Before the Municipal Corporations Act of 1835, Liverpool's municipal government had acted under the authority invested in the council by the Royal Charter. The council was the representative body for the freemen of the town, consisting of a mayor, councillors and aldermen - all self selected and the positions tenable for life, thus preventing the complexion of the council from adapting to the changing power structures within the town. The freedom of the town was primarily a hereditary system. In 1835 there were several thousand freemen of Liverpool. There were disputes in the late eighteenth century even between the council and freemen over their accountability, and the failure of the unreformed corporation to manage the growing urban environment had led to the development of independent authorities, such as the Watch Commissioners set up in 1738 and the Highway Board which was established in 1820. However, the corporation of Liverpool was:

far more comprehensive, honest, efficient and enterprising than the contemporary average; in fact it is doubtful whether the Liverpool Corporation could have made such progress as it did in subsequent years if it had not been for the achievements of the old pre-1835 council.<sup>53</sup>

The 1835 Municipal Corporations Act had less effect in Liverpool than in other towns. The franchise was widened from freemen to a new property qualification, but disparities continued. In 1859 there were 18,855 voters on the parliamentary register but only 14,744 municipal voters. At the first elections held after the Act the Liberals formed the majority party in the council and one of their first actions was to establish a

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<sup>51</sup> Vigier, *op.cit.*, p. 69

<sup>52</sup> N. Kemp, *Scientific and Technical Education in Liverpool 1857-1902* (Unpub. M.Ed. thesis: Leicester, 1971)

<sup>53</sup> B.D. White, *A History of the Corporation of Liverpool 1835-1914* (Liverpool: Liverpool University Press, 1951), p. 8

new police force - the first large body of council employees. When the council began to extend its influence in to sanitary control it was the police force who carried out their orders.<sup>54</sup>

The Liberals lost control of the council in the 1842 election mainly because of the greater skill and manipulation which the Tories were able to use. Waller has said that:

Liberalism was a creature of stunted growth in Liverpool.<sup>55</sup>

The Conservatives controlled the council for the next 40 years. The corporation was to become the principal governing organisation of the town during the nineteenth century, with the gradual synthesis of urban services. However, in 1835 they lost control of the organisation which had been responsible for the growth of the town - the Dock Estate. This had been a main source of revenue for the old corporation but the merchants who had created the wealth of the docks were dissatisfied as they were not eligible for council positions as few of them were freemen.

The political question in Liverpool as in Belfast was strongly linked to the sectarianism that the town had developed through the Irish immigration of the early nineteenth century. They were mainly Protestant Irish and they soon instituted the organisations they had left behind them. The main one was the Orange Lodge. This fierce religious group was naturally opposed to anyone who had sympathies for the Catholics of whom there was an equally vociferous community in the town. The Liberals, with their Unitarian leaders expressed a certain loyalty for the Catholics if only because they believed in the freedom of religious choice. The Orangemen were therefore forced into the Conservative camp. This reinforced the Conservatives' existing appeal to the working classes in Liverpool. Unlike the Liberals they promoted themselves as the champions of the lower respectable classes and were not seen in a patronising light. The Liberals were renowned for their wealth and social cliques. They were dominated by the richer merchants and shipowners. Their Liverpool leader, William Rathbone, was famous for his charitable works but at the same time he was seen as a hard hearted man, who objected to the democratisation of the Poor Law Guardians because he feared it would lead to mass charity for the undeserving. The Liverpool Conservatives were practised in "stooping to conquer".<sup>56</sup> The Working Mens' Conservative Association was formed in Liverpool in 1868 and was influential in Conservative politics in the town which was organised on a caucus system. The WMCA united the causes of Conservatism and Protestantism.

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<sup>54</sup> P.J. Waller, *Democracy and Sectarianism - a Political and Social History of Liverpool* (Liverpool: Liverpool University Press, 1981)

<sup>55</sup> *Ibid.*, p. 16

<sup>56</sup> *Ibid.*, p. 81



The period between the second and third Reform Acts of 1867 and 1884 respectively, saw in Liverpool a continued domination by the Conservatives in both local and national government. The Liberals made an effort to address the problems of the town. They ran a temperance campaign, they accused the Conservatives of irritating the problem of alcohol abuse by their allegiance to the brewers in the town and their refusal to adopt more stringent licensing laws. The 1867 election had doubled the Liverpool electorate to 39,637. Under the Cairns Clause of the 1867 Act Liverpool had returned three MPs but the elector, as in Glasgow only had two votes, to ensure the minorities a fairer chance of representation. In the 1867 election there were two Conservative MPs and one Liberal MP for Liverpool.

### *Arthur Forwood*

There were several important political figures in Liverpool, but the one who stood above all others was Arthur Forwood. He was a Conservative councillor from 1871, mayor in 1878-9, chairman of the Constitutional Association from 1880 and an MP for Ormskirk from 1885 till his death in 1898. Forwood had Liverpool in his pocket. Through his manipulation of the caucus system he personally selected most of Liverpool's Conservative candidates for both municipal and Parliamentary office from 1878 till his death. He managed to preserve the union between the Conservatives and Orangemen despite many rows, and after 1885 he harnessed the town's opposition to Gladstone's Home Rule plan to strengthen the Conservative cause.

In 1885 Liverpool's constituency was redistributed and the nine new Parliamentary constituencies were formed - making Liverpool the largest unit of representation outside London. The 1885 general election confirmed the Conservative domination in Liverpool. They won 8 of the 9 seats. This election saw the introduction into Liverpool politics of the nationalist Irishman, Parnell. He made Liverpool, with its 25% Catholic community the base for his Home Rule campaign. He found success with T.P.O'Connor's return for the Scotland Road constituency as the only non-Conservative MP in Liverpool. The Conservative supremacy was undoubtedly 'bona fide' in terms of the percentage of the voters backing them, but the unfranchised majority were denied the opportunity of participating in the decision making process. Partly this was due to the rapid turn over in the occupancy of rented accommodation. Less than 25% of tenants occupied the same property for more than two years, moves being necessitated by unpaid bills and the threat of the school board inspector. Registration was therefore lower than it should have been.

The issue of social reform in Liverpool was the aim of all the political parties, but Forwood recognised that public health was controversial because:

of the resultant trespass on the previously untrammelled freedoms in the ownership of property and the management of business.<sup>57</sup>

Forwood was thus forced to tread carefully in the area where public, private and party interests collided. He also acknowledged that his party was unsuited to win elections through its social conscience and that national themes, such as Irish Home Rule, won more votes. By the end of the 1880s Conservatives in Liverpool were facing new opposition in the form of the mobilisation of the labour interest. This first established itself through the Liverpool Trades Council (L.T.C.) which aimed at securing the rights of the port workers. The National Union of Dock Labourers (N.U.D.L.) was formed in Glasgow in 1890 and Liverpool was soon affiliated to it. 1890 witnessed a major uprising of the dockers when they staged a strike in February and March. They were only partially successful in introducing new rights for workers, and by 1891 the old problems had returned. The labour cause in Liverpool was damaged in the last years of the nineteenth century by the disputes between the L.T.C. and the N.U.D.L. The Conservatives lost control of the council only once to the Liberals, for the years 1892 to 1895. Forwood claimed that they won by trickery because the 5 largest wards with 55,000 electors returned 15 councillors and the remaining 11 wards with a combined electorate of only 17,000 returned 33 councillors. The 'hot seats' of the chairmanships of the Watch and Health committees remained unchanged, showing that the Liberals were 'indifferent to improvements when these confronted the Liberal party priority of cheap government'.<sup>58</sup>

The Liberal period of rule finished in 1895 with the crash of the Liverpool council and the Liberal national government. The redistribution of ward boundaries in Liverpool gave the Conservatives a fairer chance and the smaller size of the ward electorates allowed Protestant and Labour factions to stand independently from Conservative and Liberal establishments. The Liberals knew their days were numbered and they chose the last possible date for polling to take place. Waller states that:

in 1895 the Liberals were as lively as wrung chickens who mimic immortality before they collapse.<sup>59</sup>

In the 1895 municipal elections the Conservatives increased their number on the council from 29 in 1892 to 64. There were now 22 wards instead of 16 and the electorate had increased to 97,873 making Liverpool the country's largest municipal constituency. One of the first actions taken by the Conservatives when they returned to the Town Hall was to levy a rate to remove the £50,000 debt the Liberals had incurred. How this debt had arisen is not clear as they had cut the budgets in most municipal departments during

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<sup>57</sup> *Ibid.*, p. 138

<sup>58</sup> *Ibid.*, p. 154

<sup>59</sup> *Ibid.*, p. 154

their years in office. Forwood, who was not given a government post in Salisbury's third ministry, confined his attention to promoting the municipalisation of the private electric company in 1896 and the private tramway company in 1897. He also pursued the idea of increasing the corporation's housing stock. When he died in 1898, Conservatism in Liverpool had lost its voice, and it took some time before a replacement was found in the person of Salvidge.

To summarise the political history of Liverpool in the nineteenth century, undoubtedly the major trend was the domination of the Conservatives, aided by the support of the Protestant Orange Lodges. The failure of the Liberals was not totally their fault. They alienated the working classes by their toleration of Catholicism and when the Home Rule issue developed in the 1880s the majority of Liverpool's inhabitants saw the proposal as a direct political threat to the prosperity of their city. The brief periods of Liberal control were characterised by negative financial programmes and a failure to tackle the problems of a volatile port economy - poverty, unemployment, poor housing and a deficient sanitary system.

## 2.5 Comparison of the Three Cities

The initial comments on the three cities must revolve around their population growth, as this is crucial to the understanding of their subsequent problems.

Table 2.1 Compound Rates of Population Growth 1861-70 to 1891-1900

	1861-70	1871-80	1881-90	1891-1900
Liverpool	1.61	1.68	0.61	1.09
Belfast	5.24	1.68	1.94	2.43
Glasgow	1.96	0.64	1.03	3.03

Table 2.1 illustrates the fluctuations in population growth in the three cities on a decennial time scale. This format for presenting the data emphasises the relative situation, and thus which of the cities could be expected to show the most strain on housing stock, urban services, employment markets, etc. The most striking feature of table 2.1 is Belfast's growth of 5.24% for the decade 1861-70. This comes at a time in Belfast when municipal expenditure is only just recovering after the constraints of the Bates era. The municipal infrastructure had been stifled for so long that such a massive expansion of the population could only add to the burden. However, another view which must be expressed is the contributions to this increase through natural growth or

migration. If the increase is natural growth (more infants) it effectively means an increase in the dependent population, which will not contribute to the economic structure of the town for at least 15 years. If, on the other hand, the growth represents in-migration we can assume that the migrants are capable of employment. Section 2.2a illustrated that Belfast did not have a serious employment problem during the nineteenth century. Thus it could be suggested that the migrants would contribute to the maintenance of the urban infrastructure through the rating system, rather than draining the city of resources in the form of poor relief.

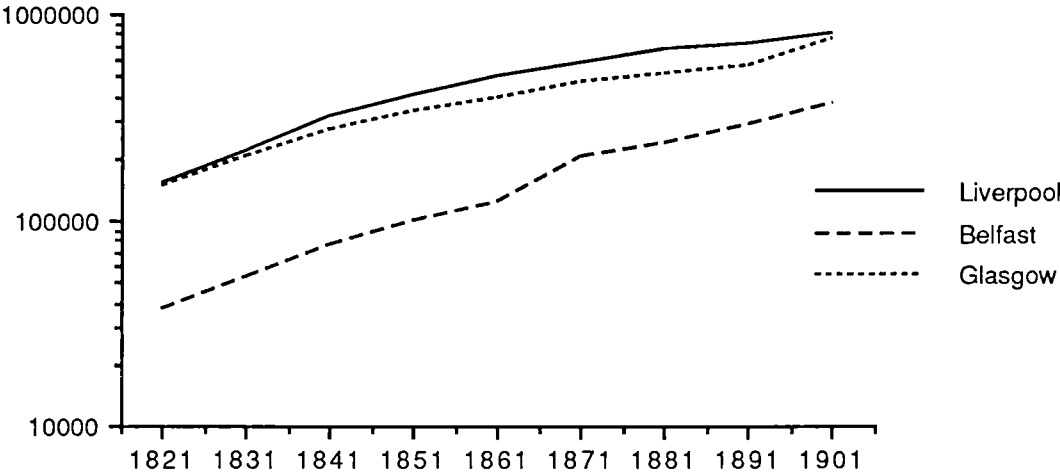
Liverpool's low rate of increase in the 1880's is possibly due to the rise in the areas immediately surrounding the city, such as Walton, Wavertree and Garston, which were the destination for large numbers of the working and middle classes who were freed from the city centre by the expanding transport system. The subsequent increase in population growth rates in the 1890's for both Liverpool and Glasgow reflects the extension of the city area to incorporate the new suburbs. Glasgow's steady increase in population should have avoided any sudden stress on the urban services, and allowed time for planned expansion.

Figure 2.4 uses a log-normal scale to show the comparative growth rates. Belfast starts from a lower base but its expansion is constant throughout the century. Liverpool and Glasgow have a similar pattern, showing initial rapid growth and then a decrease in the rate after 1861. The graph, however, does not show the components of this growth. Given the high mortality rates which prevailed in industrial cities in the nineteenth century much of this growth must have been due to in-migration. This will be discussed at greater length in chapter five. The source of the population would have been of less concern to the authorities than the problems of management of the vast numbers. The contemporary literature shows the complexity and diversity of the urban populations. The Victorian urban landscapes may have looked much the same - a haphazard collection of buildings, rich and poor housing areas and industrial sites, but the cities considered here each had their own culture by the start of the nineteenth century. The best way to arrive in these cities must have been by ship. It is the accounts of travellers arriving in this way which provide the most evocative pictures of life in a Victorian seaport. Hugill describes the confusion that met the eye at Liverpool - a jumble of masts, noise, dirt and behind this initially informal dockside area was the grandeur of buildings like St George's Hall, the Walker Art Gallery and the refined residences of the wealthy on the hill overlooking the port.<sup>60</sup> Comparisons were made between Glasgow and Edinburgh, which were so close geographically, yet totally different. Glasgow responded quickly to changes in the industrial base of the economy and achieved a reputation for its civic enterprises, but in the minds of people from

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<sup>60</sup> S. Hugill, *Sailortown* (London: Routledge, 1967), p. 95

*Figure 2.4 Log Scale Graph of Population Growth in Liverpool, Belfast and Glasgow 1821-1901*



*Source: Census reports for England and Wales, Scotland and Ireland 1841 to 1901*



Edinburgh the city of Glasgow was uncivilised and of low social stature. Glaswegians, in an attempt to overcome this lack of heritage and culture, drew more firmly on their history as an ancient religious centre and university town. Likewise, the comparison made between Manchester and Liverpool by Victorian writers hinted at the lack of an upper class in Manchester and the well developed social network which existed in Liverpool. Cities were also imbued with the personalities of their leading citizens. The use of Birmingham as the model of civic achievement was linked with the aura of Chamberlain. Actually, Birmingham lagged behind both Liverpool and Glasgow in several areas of municipal life, but these two cities lacked 'personalities' and hence rendered them redundant as examples of forward municipalities.

There were, however, influential families and social groups in all three cities. In Liverpool they were more visible than the others for the whole of the nineteenth century. The Rathbone family which provided the city with many of its foremost merchants and shipowners was involved in local charities, local government and had influence in national government.<sup>61</sup> They were linked through intermarriage and church attendance to similar families - the Holts, Derbys and Gladstones. In Belfast the situation was not so advanced. In the local elite only one family dominated - the Donegalls. As major landowners in Belfast they effectively had the power which in Liverpool was in the hands of the corporation. They controlled the urban morphology for the first half of the nineteenth century and represented Belfast in national government. Glasgow does not seem to have had such an influential urban elite. There were important families but their manipulation of the urban government was limited.

The experiences of the cities differ in four main ways - economic structure and employment, sectarian disputes, politics and local government and finally social structure. Many of these areas are interlinked and thus pose a difficult problem of how to organise the explanatory sections. For example, the sectarian dispute has a different impact on the employment structure in each of the cities and this in turn has implications for the development of working class politics, locally and nationally. The most logical starting point is probably the economic structure in the cities and the resulting differences in employment.

#### *Differences in economic structure*

All the cities expanded their economies initially in the eighteenth century in response to the growing trading links with the New World. Textiles feature prominently in the industries established in both Glasgow and Belfast, whereas Liverpool's contact with the textile industry was through the importation of cotton to supply the Lancashire mills. Thus the profit of the cities was tied to the same

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<sup>61</sup> S. Marriner, *The Rathbones of Liverpool* (Liverpool: Liverpool University Press, 1961)

commodities and led to the development of a merchant class in each place. Likewise, each place serves as a reminder of the vulnerability of the capitalist system, due to its dependence on other economies. This in turn has important implications for the way in which the ruling classes in the urban community sought to maintain control of the methods of production and conditioned the conflict between capital and labour. Foster has suggested that the existence of sub-groups within urban society was closely related to the differentiation within the employment market. He theorises that the development of working class consciousness would occur more readily in economies which offered limited work for women and children as the household income would not be supplemented and thus the dichotomy between the rich and the poor would be more visible.<sup>62</sup>

It is important to supplement information on the male-female employment split with details on the earning capacity for the different occupations. Income levels were surely as much a determinant of working class consciousness as the opportunity to work. Treble has shown through detailed analysis of the major employment sectors within the British nineteenth century city that there was a wide spectrum of wage rates, with females somewhat predictably being paid less than their male counterparts even if they were the main 'breadwinner' for their families.<sup>63</sup> Unskilled labourers constituted the majority of the urban employable population in Liverpool, Belfast and Glasgow. Yet the income for this group rarely reached the minimum necessary to ensure the well-being of their families. A survey in Glasgow in 1902-03 of 1680 labourers earned on average 19s. per week and reported that

'supposing that they did not spend a penny ...in drink... [was] not sufficient to provide themselves with either a proper home or the proper necessities'.<sup>64</sup>

There were similar employment conditions for unskilled workers in the shipbuilding, foundry and engineering firms. Textile work could produce a decent income, but often it involved domestic piecework, where long hours were required to achieve a useful income. Opportunities for female and child labour existed primarily within the domestic and retailing sectors of the economy. Some domestic service for young single women offered board and lodgings with a minimal wage. However, all domestic work required stamina and good health. When a woman lost these attributes she could easily find herself out of employment. Retail employment grew rapidly in the second half of the nineteenth century, with the establishment of department stores. Yet for a substantial percentage of the poor within urban area retailing offered a last lifeline. Many operated

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<sup>62</sup> J. Foster '19th Century Towns: a Class Dimension' in H.Dyos, *The Study of Urban History* (London: Arnold, 1968), p. 295

<sup>63</sup> J.H. Treble, *Urban Poverty in Britain 1830-1914* (London: Methuen, 1983)

<sup>64</sup> *Glasgow Municipal Commission on Housing* (1902-03) qq.12794, 12857.

on a limited credit and stock basis as hawkers and street sellers, selling whatever they could lay their hands on.

The picture which emerges of the employment opportunities within British nineteenth century cities thus highlights to some extent the extremes which could be found within the broad occupational bands as used in the Census returns, and reflected in figures 2.5 and 2.6. A general conclusion can be made that workers without skills had little hope of rising out of poverty. Those workers with skills could still find themselves on the margins of poverty, depending on the fluctuations in the economy. It is important to have some knowledge of the income opportunities for the urban dwellers because their contribution to the financing of the urban infrastructure through the rating system will depend on their ability to spend money on rents. Thus, that proportion of the population which lives below the poverty line will effectively drain the urban area of resources (via the Poor Law, charities, etc.).

There is limited data on female employment for the three cities, but some deductions are possible, given the major employment areas of the economy. In Liverpool, where employment was concentrated in the physical dock and warehouse work as well as the male dominated clerical areas, the scope for female employment must have been more limited than in Glasgow and Belfast where the textile industries relied heavily on female labour. Cane estimates that in 1850 in Glasgow there were approximately 200,000 women employed in the muslin industry alone. In terms of total female employment in Glasgow, the proportion peaked in 1861 at 37.13% of the workforce, falling to 31.06% by 1901. Most of this decline was accounted for by the decline in textiles and domestic service.<sup>65</sup>

Liverpool consistently lagged behind the other two cities in terms of industrial employment, and this partly explains the unique industrial relations within the city. Figure 2.5 illustrates the employment structure for both Liverpool and Glasgow for 1861, and shows the smaller industrial workforce in Liverpool. Figure 2.6 produces employment structures for the year 1891, this time including Belfast. Liverpool's smaller industrial base is again evident, as well as its strength as a commercial centre, which had been developed more than in the Glasgow and Belfast.

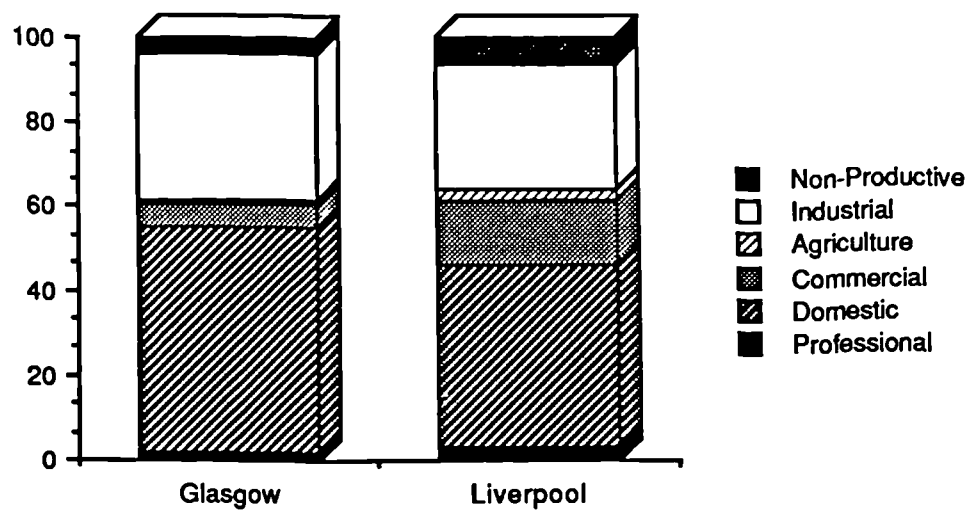
The artisan class in Liverpool was comparatively small and thus the main employment areas were the docks and clerical work. Clerical work was primarily skilled, regular and well paid, thus not likely to cause any labour disputes. Dock work, by contrast was casual and poorly paid. By 1891 27% of Liverpool men aged 10 and over were engaged in transport work and the next largest group was 16% who were classified as 'without specific occupation'. For Glasgow the proportion employed in

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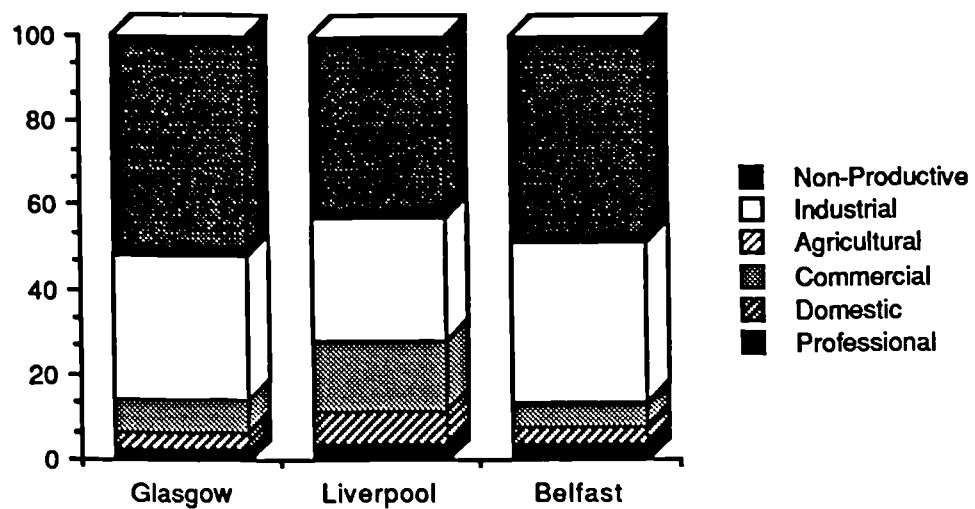
<sup>65</sup> R.A. Cane, *The Working Class of Glasgow 1750-1914* (London: Croom Helm, 1987), p. 3 and p. 20



*Figure 2.5 Employment Structure in Liverpool and Glasgow, 1861*



*Figure 2.6 Employment Structure in Liverpool, Belfast and Glasgow, 1891*



*Source: Census reports 1861, 1891*

transport was only 9%, and the main class of employment for males in the city was in industry (46%) which included the categories of shipbuilding and manufacturing.<sup>66</sup> In Belfast in 1891 the percentage of the workforce with industrial jobs was 37% and those classified as 'indefinite and non-productive class' was 48%.<sup>67</sup> It would be expected therefore, that political agitation by the working classes would be much greater in Liverpool and Belfast, where the employment conditions were worse than in Glasgow, if the second part of the Foster hypothesis is correct. He correlates the development of working class consciousness with a narrow employment base, in which the conflicts of capitalism would be more visible. This theory is true for Liverpool, but in Belfast national political questions on the fate of the Province seem to have overshadowed any mass organisation of the working classes.

### *The influence of sectarianism*

Turning now to the issue of sectarianism in the cities, which has implications for the treatment of the Irish immigrants in Liverpool and Glasgow. One would have expected the religious disputes of Ulster to have been replicated in Glasgow rather than Liverpool as its contacts with the Province are that much older and stronger. The ratio of Catholics to non-Catholics in Glasgow and Belfast is 1:3 and Presbyterianism is the leading protestant religion for both.<sup>68</sup> However, it was in Liverpool that sectarian violence flared in the nineteenth century and pervaded the local and national political systems. Municipal government in the city was divided between the Irish Catholics on one hand and the combined forces of the Irish, English and Scottish Protestants on the other. The number of Irish immigrants into Glasgow and Liverpool was approximately the same.<sup>69</sup> One similarity, though, in religious matters is that the Catholics in all the cities had Southern Irish connections while the Protestants were Ulstermen or of Scottish descent. In Belfast, the proportion of Catholics in the population declines throughout the century as shown in Figure 2.7, but their impact on politics remained high.

The majority of Irish immigrants to the mainland were of the lower socio-economic groups. In Liverpool they found employment in the unskilled portage and carting sectors, where they were resented by the indigenous labour force because of their willingness to accept lower wages. Gallagher has suggested that the Irish in Britain were generally not as upwardly mobile in their urban environment when

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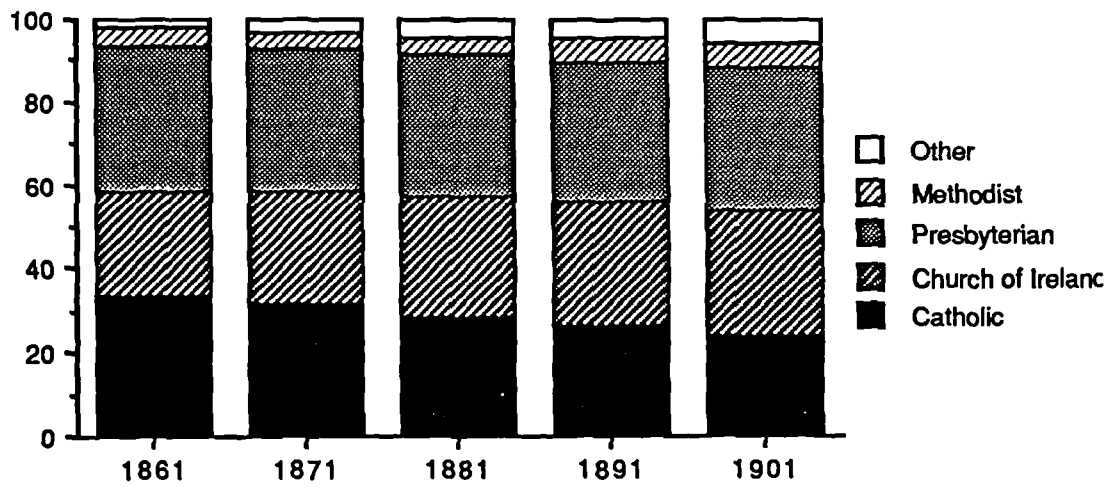
<sup>66</sup> Census of Scotland 1891

<sup>67</sup> Census of Ireland 1891

<sup>68</sup> F. Neal, *Sectarian Violence* (Manchester: Manchester University Press, 1988), p. 9

<sup>69</sup> I. Budge and C. O'Leary, *op.cit.*, p. xv

*Figure 2.7 Religious Denominations in Belfast 1861-1901*



*Source: Census reports 1861-1901*

compared with the Irish in America or the Jews in Britain.<sup>70</sup> In Glasgow the semi-skilled Ulstermen were welcomed into the shipbuilding firms and in the boom economy of the late nineteenth century their labour was appreciated. The combination in Liverpool of sectarian violence, a large Irish unskilled workforce and a volatile economy could explain why urban politics were so much more important than in Glasgow. It would seem that in Liverpool the Irish remained as a distinct ethnic minority (evidenced by the only Irish Nationalist MP on the mainland) whereas in Glasgow they assimilated readily into the existing social structure. This hypothesis is based on the work of Smith, who looked at the locations of the Irish within both Liverpool and Glasgow, and found persisting Irish 'ghettos' in Liverpool, which were closely associated with the location of dock work.<sup>71</sup> This point is also re-enforced by the research of Pooley on Liverpool's Irish population. He found that the Irish were closely associated with the areas of high density sub-standard housing within the city.<sup>72</sup> In Glasgow however, there were no strong ethnic neighbourhoods. Smith found that

'some municipal wards were more artisan, and some more unskilled, particularly in the inner city, but none were entirely Catholic or Protestant. No Irish Catholic community developed similar to the Scotland Road.'<sup>73</sup>

### *Politics and local government*

The political character of the three cities was not identical. Liverpool and Belfast were both Conservative strongholds but Glasgow was a Liberal city for most of the nineteenth century. It is the allegiance of the various religious groups to the political parties that in part explains this difference. Because the 'Home Rule' question was so important to the inhabitants of Liverpool and Belfast, it followed that the protestants in the cities would associate themselves with the party which opposed the measure. Thus in Liverpool the strength of the Conservative party rested on the coalition of the loyal protestants (the Orange Lodges) and the Working Mens' Conservative Association. The sectarian issue thus cuts across the expected political divisions as outlined by Foster. It stifles the gradual evolution of a working class movement until the end of the century, and this is reflected in the type of 'community' organisations found in the city. Whereas

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<sup>70</sup> T. Gallagher, 'A Tale of Two Cities: Communal Strife in Glasgow and Liverpool before 1914' in R. Swift and S. Gilley (eds.), *The Irish in the Victorian City* (London: Croom Helm, 1985) p.109

<sup>71</sup> J. Smith, 'Class, skill and sectarianism in Glasgow and Liverpool, 1880-1914' in R.J. Morris (ed.) *Class, Power and Social Structure in Nineteenth Century British Towns* (Leicester: Leicester University Press, 1986) p.171.

<sup>72</sup> C.G. Pooley, 'The residential segregation of migrant communities in mid-Victorian Liverpool', *Transactions of the Institute of British Geographers*, (1977) new series 3.

<sup>73</sup> J. Smith *op.cit.*, (1986) p.188.

in Glasgow there was a strong Co-operative movement and other working class clubs, in Liverpool their place was taken by Orange Lodges, freemasonry and religious bodies.<sup>74</sup> In both Liverpool and Belfast national political issues were reflected in the high level of political activity among the working classes. This concern for national debates is missing in Glasgow and may explain the relatively low levels of political participation, particularly in general elections.

Local government was also influenced by national politics in Belfast and Liverpool, but not in Glasgow. However, a common theme to local elections in all three cities was the concern for economy in the municipal budget. Following the Municipal Reform Act of 1835 a mechanism for the wider participation of the urban dwellers in the government of their city was created. The variations in the use of this 'power', the relative image of the councillors and the existence of alternative seats of urban power all have important implications for the explanations arrived at in the following chapters of the thesis. To be more specific, the implementation of the large water schemes of the middle decades has to be re-analysed. The usual context for investigations of these schemes has been one of progressive improvement in the light of the public health of the urban area. However, research which focuses purely on the health implications of the improvements neglects the issue of how the need for the schemes was translated into action. It is important to analyse the objectives of the ruling party in local government in terms of who in the community they are attempting to benefit. Equally important is the study of how the source of power in the urban community changes throughout the period in response to central government compulsion and the development of new local sub-groups.

Hennock's work on the composition of councils provides a useful yardstick with which to measure the three cities. In his study of Birmingham and Leeds he identifies changing proportions of professionals, shopkeepers and businessmen which he correlates with the changing fortunes of the municipal expenditure. In Birmingham the deficit in the Improvement account in 1855 due to an optimistic road and sewerage system led to the downfall of the council and the mass resignation of the Finance and Public Works Committees. This was a clear indication of the dissatisfaction of the ratepayers with their elected representatives. The new 'economy' motivated council replaced the Borough Surveyor with his assistant at half the salary and shelved road building plans, thus incurring penalties with the contractors.<sup>75</sup> This theme of the wealth and status of the council being translated into the actions of the corporation is developed by Daunton.<sup>76</sup> His investigation of Cardiff's municipal affairs during the nineteenth

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<sup>74</sup> J. Smith 'Labour Traditions in Glasgow and Liverpool', *History Workshop* 17 (1984), p. 47

<sup>75</sup> E.P. Hennock 'The Social Composition of Borough Councils in Two Large Cities 1835-1914', in H. Dyos (ed.), *op.cit.*, p. 322

<sup>76</sup> M. J. Daunton, *Coal Metropolis: Cardiff 1870-1914* (Leicester: Leicester University Press, 1977)

century illustrates the lack of interest the local business community had for the corporation, because it had no control over the docks. This was a very similar situation to that in Belfast, where the Chamber of Commerce excited more interest from the local elite than the impotent town council. Daunton's hypothesis for the cycle of municipal expenditure relates to the alternate domination of the council by the Liberals and Conservatives, who represented opposing groups of Cardiff's population who wanted either minimal expenditure on services or, at the other extreme, massive investment in infrastructure and expansion into municipal trading.

This issue of decision making in the urban environment is crucial to the interpretation of the sanitary systems which were introduced. Thus chapter seven on the role of the public health professionals investigates the transfer in power from councillors to municipal employees during the course of the century. A similar relationship between council politics and municipal expenditure can be seen in two of these cities. Belfast voters linked the sectarian dispute to a fear of over-spending by John Bates to remove him from the council, and in Liverpool, Waller has noted that fear of election defeat prevented many councillors from initiating expensive schemes.<sup>77</sup>

Despite the sectarian nature of municipal activity, the personnel of the three councils was competent, and the position of councillor was respected in all three cities.<sup>78</sup> However, in both Belfast and Glasgow, the merchant class chose to manipulate urban affairs from outside the council chamber, using more effective tools such as the Docks and Harbour Boards and the Police Commissioners. This reflects the inadequate local government machinery in these two cities in the first half of the nineteenth century, which was not improved till the amalgamation of urban authorities and the extension of the franchise. In Liverpool the situation was different. It was recognised as one of the most efficient and just of the un-reformed corporations prior to the 1835 Municipal Reform Act and as such it attracted all persons aspiring to control over the urban environment. The financial problems of Liverpool's corporation were to a certain extent shielded from the urban population due to the large income they received from the corporate estate and the docks. Thus the ratepayers were initially cushioned from the tremendous cost of municipal schemes until the Mersey Docks and Harbour Board was established in 1858.

The issue of the extension of the franchise in each of the cities is important as it will determine how effective the corporation was at expressing the wishes of the actors, as outlined by the structuralist model. By 1901 the municipal franchise was as follows: Liverpool 27%; Glasgow 31%; Belfast 35%. The achievement of this rate of potential

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<sup>77</sup> P.J. Waller, *Town, City and Nation* (Oxford: Clarendon Press, 1983) p.291

<sup>78</sup> I.G.C. Hutchinson, *Politics and Society in Mid-Victorian Glasgow 1846-1886* (Unpublished Ph.D. thesis, University of Edinburgh 1974), p. 397

political participation varied in the three cities. In Glasgow the Burgh Reform Act of 1833 extended the municipal franchise to all those who qualified for the Parliamentary vote - this was approximately 9,000 from a population of over 202,400. The 1833 Act had divided the city into 5 wards and provided for the election of 6 councillors per ward. One third of the councillors for each ward had to retire each year, thus allowing for changes in the urban political structure to be efficiently responded to in the council. This did not always work as smoothly as hoped - by 1883 the 300 strong Jewish community in Glasgow had a councillor to represent their opinions, but the Irish in the city, who numbered over 80,000 did not have any municipal representatives.<sup>79</sup> The growth of Glasgow was reflected in the expansion of the city area in 1846 and the increase in the number of wards to 16 and the membership of the council to 50. The elections which accompanied this alteration give some indication that in Glasgow, the municipal franchise was not recognised as an effective way of manipulating the decision-making process. The poll was 39% and 11 of the 16 wards were uncontested. A similar trend can be observed in the 1872 elections, when only 7 of the 16 wards were contested, and the main issue was temperance, not municipal expenditure as would have been expected. The 1872 election had a poll of 30% from an electorate of over 53,000. These figures can be taken either as a sign of the electorate's trust in the status quo, or an indication that the electorate did not include those who wished to participate in municipal government. However, following the franchise extension to include women ratepayers in 1882-3, the 1891 election only recorded a poll of 29.8%.<sup>80</sup>

In Liverpool the issue of municipal power was more precious to the urban dweller, and the sectarian problems were brought into the municipal elections. The municipal franchise barred many of the would-be political activists from the process of urban government. The 1835 Act required a voter to have paid rates for three years prior to registration. This effectively removed a large number of voters who did not have their names on the rate books as they paid their rates through their landlords - a practice known as compounding, whereby the corporation offered a discount to the landlord to collect the rates on their behalf to reduce the level of defaulting. A substantial number of ratepayers were therefore excluded from the electoral roll. The problem of compounding was raised several times between 1835 and the eventual abolition of the system in 1884 which established uniform household suffrage. In 1869 the Assessed Rates Act allowed landlords to compound for property rated at less than £13 in Liverpool, and £8 in the other cities, and the tenant to still be eligible for the electoral roll. A far more important problem than compounding was the fact that

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<sup>79</sup> J. Cunnison and J.B.S. Gilfillan, *op.cit.*, p. 425

<sup>80</sup> *Ibid.*, p. 425

working class cottages were generally not rated at all. This must also have caused some of the discrepancy between the municipal and Parliamentary franchise as shown in Liverpool in 1859 when the voters on the Parliamentary register numbered 18,855 and the municipal register had only 14,744.<sup>81</sup> The municipal franchise would also fail to recognise those people who moved frequently within the city. A concession to this problem was made in the 1869 Municipal Franchise Act which reduced the qualifying period of residences from two and a half years to one, thus bringing it into line with the Parliamentary franchise.<sup>82</sup>

From the 1835 Municipal Reform Act until 1867 Liverpool was divided into 16 municipal wards, represented by 48 councillors. As stated above, municipal politics in Liverpool excited a lot of public interest. However, this declined throughout the nineteenth century, as illustrated by the number of municipal wards which were contested at the annual elections. For the period 1835 to 1844 there were always more than 10 of the 16 wards contested, but for the period 1848 to 1867 the figure only once rose above 9 wards.<sup>83</sup> This trend must be balanced by an awareness that municipal issues were still important. In 1888 the Liberals won St. Annes Ward in a 75% poll of the electorate - the issue was municipal economy. In 1867 the electoral system was reformed again and the number of councillors increased to 64.

Further changes were made in 1885 when the ward boundaries were re-drawn for both municipal and Parliamentary elections. Liverpool became the largest unit of representation outside London with 9 Parliamentary constituencies. The strong pattern of residential segregation in the city based on class and sectarian lines thus ensured that these small constituencies and wards could be captured by urban minorities. It was estimated that Irish Catholics constituted over 25% of the Liverpool electorate.<sup>84</sup> Their support for the Liberals led the Conservatives to complain at the unfair boundaries, which did not consider the suburban drift of population, leaving the Catholic working class in a majority in the city centre wards. This is evident from the 1892 municipal elections in which the 5 largest wards which contained 55,000 electors returned 15 councillors, and the remaining 11 wards representing only 17,000 electors returned 33 councillors. The Liberals benefitted so much from this distribution that they effectively killed a petition in 1891 to redistribute the wards. A redistribution was delayed until 1895, when 22 wards were created out of the previous 16. This was fairer, but a Liberal concession was that 5 of the 7 central wards had smaller populations, but

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<sup>81</sup> B. D. White, *op.cit.*, p. 15

<sup>82</sup> B. Keith Lucas, *op.cit.*, p. 74

<sup>83</sup> D. Fraser, *Urban Politics in Victorian England* (Leicester: Leicester University Press, 1976) p.147.

<sup>84</sup> P.J. Waller, *Democracy and Sectarianism: A Political and Social History of Liverpool* (Liverpool: Liverpool University Press, 1981) p.40.



needed greater representation because so much rateable value was concentrated within this district.

The Liverpool Conservatives were however assisted until the 1910 Municipal Corporations Amendment Act by the system of election for aldermen. Up to this date the aldermen (traditionally a Conservative group) were selected by councillors and non-retiring aldermen. This guaranteed the Conservative majority despite increasing Liberal victories in the elections for councillors.

In Belfast, the Police Committee had relatively more power in the early decades of the nineteenth century than the municipal corporation. It is therefore the electorate of this body which was important in the manipulation of the urban environment. The electorate for the police committee was restricted to those whose rates bill was more than 20s p.a. and the qualifications for election as a Police Commissioner was a personal estate over £2,000 (£1,000 to be on the Police Committee). This meant that the working classes could never achieve representation on the body which had most control over their lives. In 1816 the electorate was narrowed still further by raising the rate bill qualification to £2 p.a. New channels for participation in urban government were opened in 1838 and 1840 respectively. The Irish Poor Law Act of 1838 enfranchised £10 householders and the wide powers which the parochial bodies gained for themselves meant that it became an alternative way of exercising power.

The Irish Municipal Corporations Act of 1840 removed the corrupt corporation of Belfast and instituted a more representative organisation based on a £10 voting qualification. The new municipal area was divided into 5 wards and each ward was assigned 2 aldermen and 6 councillors. Now that the Police Committee was obsolete it ceased to be a power base in the city and its functions were transferred to the corporation. The continued use of separate rates for Police, Washhouses, Water and Poor until they were consolidated in 1858, meant, however, that ratepayers could still exert some coercion on the corporation in respect of particular areas of expenditure. The Irish Reform Act of 1868 lowered the qualification for the Parliamentary franchise to property over £4, resulting in a Parliamentary electorate of 12,168 compared with a municipal franchise of 3,243.<sup>85</sup>

What expectations have been raised by the information presented so far for the three cities? The political system operating in each place should certainly have some impact on the choice of, and timing of, the introduction of major sanitary systems. If the structuralist model indicates any potential connections between politics and policy, the tight control exerted in Belfast by Bates should be evident. It is likely that given the long term dominance of the Donegall family over Belfast municipal affairs, that some

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<sup>85</sup> I. Budge and C. O'Leary, *op.cit.*, p. 15

alternative mechanism for sanitary reform will have been established to circumvent this block on sanitary expenditure. The lack of political participation in Glasgow may suggest that without a specific pressure group campaigning for sanitary reform, the introduction of sanitary systems would be correspondingly slower. Whereas in Liverpool, the activity of local political groups may have hijacked sanitary issues to further their long term aims.

## Chapter Three

### Mortality

#### 3.1 Quantifying Sanitary Reform

The aim of this chapter is to investigate how the demographic structure of the three cities changed during the period, in particular focusing on those specific disease indicators which may reflect improvements in the sanitary condition of the urban environment. This is important for two reasons, first there is an ongoing debate within historical demography and medical history as to the relative contributions of sanitation and living standards to changes in mortality rates. Secondly, mortality rates presented the urban dweller with an often terrifying warning that there was something seriously wrong with the condition of the urban environment. Sanitary reform was frequently a primary response to these warnings. It is therefore necessary to establish the scale of the problem in each of the three cities before attempting to find any links with the specific sanitary systems described in the subsequent chapters.

A key theme to this chapter can be expressed thus: can sanitary reform be quantified? In other words, can we predict that the introduction of certain systems or volumes of services will achieve a proportionate decline in the mortality rate? Furthermore, can we be certain that the changes in the mortality rate will be evident only in certain age groups, or particular disease categories? In order to test such an ambitious hypothesis a substantial amount of information is required. Ideally this would include intimate details on the introduction of domestic as well as public sanitary systems, information on living standards, quantities of water supplied and its usage, as well as more ephemeral information such as the efficiency of the staff of the public health and cleansing departments. For the other side of the equation information would be needed on the causes of death for the urban population, in a format which identifies age, sex, residence, occupation and socio-economic status. The time series must be long enough to pick up long term trends, and ideally span the period both before and after the introduction of sanitary systems. To find an urban area with information of this quality and intensity would be a demographer's dream come true. In reality, some components of the equation exist, but few places come close to the full set.

#### 3.2 Primary Sources - Quality and Quantity

Information for the 'sanitary' side of the equation usually comes from the records of municipal authorities. The development of local government, as outlined in chapter two, frequently involved the accretion of sanitary services. These included water supply, sewerage collection and disposal, street cleaning, baths and wash-

houses, provision of hospital accommodation and other related activities. The surviving archives for these services usually consists of council committee minute books detailing the day to day operations of the departments, plus discussions on the extension of services. Occasionally there will be information on the number and location of the consumers of the services, together with their consumption rates and the revenue received by the municipal corporation. It is helpful to examine here the condition and extent of the archives for the three cities, as this will determine the way in which the central themes of the thesis are developed.

Liverpool has perhaps the richest sets of primary sources which can be used for this thesis. With the appointment of William Henry Duncan in 1847 as Britain's first <sup>we</sup> Medical Officer of Health, Liverpool Corporation established a pattern of annual reports which provide a wealth of information on how the early sanitary projects were conceptualised and managed. The other 'sanitary' positions within the Corporation also required the production of reports on the work of departments. Thus there are a series of reports from the Borough Engineer and Inspector of Nuisances which also date from the 1840's. The Corporation committee minutes supplement these annual reviews with detail on how the services were managed, and a full set of minute books is held by the Liverpool Record Office. In addition to the official archives of the Corporation, there is also a considerable amount of information to be obtained from the Liverpool newspapers. These report the public responses to the activities of the Corporation, and provide a useful indicator of the awareness of the links between sanitation and mortality. These have been used in particular in the chapter on water supply.

The jurisdiction of Glasgow's municipal corporation did not correspond with that of its English counterparts for public health services. The traditional Scottish association of sanitary and legal duties resulted in the Police Board retaining control of sanitary inspection and primary services such as sewerage until the end of the nineteenth century. The Police Board did not require the production of annual reports from its officers, and much of the detail on sanitary reform in Glasgow has been lost. The appointment of the first Medical Superintendent of Health (the equivalent of Duncan in Liverpool) was not until 1863. He was a Corporation employee, but his staff were all police officers under the control of the Police Board. Glasgow Corporation did manage the water supply after its municipalisation, and the minutes for the Water Committee are some of the most detailed that were produced by nineteenth century authorities.

Belfast provides us with the poorest set of primary sources for municipal and sanitary activity in the nineteenth century. The Corporation, as will be shown in the following chapters was little more than a skeleton public health organisation within Belfast. This is perhaps fortunate given the fact that few of the municipal records

survive from the period. The Council minute books have not been deposited with the Northern Ireland Public Record Office, but remain (uncatalogued) in the Town Hall committee rooms. Belfast's water supply during this period was managed by the Belfast Charitable Society, for which all the minute books survive, giving details on income and expenditure, as well as the extension of the supply network. Belfast appointed a Medical Superintendent of Health in 1880 (nearly 40 years after Duncan in Liverpool) but there are no reports extant before 1896. There is some information on the activities of the Cleansing and Nuisance Departments, but most of the data used in this thesis has been taken from retrospective accounts and a number of investigations made at the end of the century into the problems of the Corporation.

Having outlined the existence of primary sources for the 'sanitary' side of the equation, attention must now be given to the mortality component. The following discussion is divided into two sections - first an analysis of the national developments in demographic data, and secondly the additional primary mortality sources for each city are considered. Although many scholars have shown that the decline in mortality started well before the nineteenth century,<sup>1</sup> we are on much firmer ground, in terms of data, with the introduction of an official system of civil registration in England and Wales in 1837 (1855 in Scotland and 1863 in Ireland) and we can have more confidence in the reliability of the data for this period. Preceding the introduction of civil vital registration, the Census which started in 1801, following the 1800 Population Act, provided for the first time a count of the number and distribution of the population in the country. From 1821 information on age was collected, and in 1841 questions were introduced concerning place of birth. The annual reports issued by the Registrar Generals for England, Scotland and Ireland give official returns showing the number of births, marriages and deaths (with age and cause of death) for Liverpool, Glasgow and Belfast respectively. However, there are a number of provisos to this schedule. The countries were each divided into divisions, counties, districts and sub-districts. Each registration district was under the control of a Superintendent Registrar, who collected the data (from the birth, marriage and death certificates) and forwarded it to London for analysis and compilation into the annual reports. For England and Wales there were over 600 registration districts by 1851. Some of these were coterminous with urban areas, but many contained portions of the surrounding rural land, which poses

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<sup>1</sup> T. McKeown, *The Modern Rise of Population* (London: Arnold, 1976), E.A. Wrigley and R.S. Schofield, *The Population History of England 1541-1871* (London: Arnold, 1981), M.W. Flinn, 'The Stabilisation of Mortality in Pre-industrial Europe' *Journal of European Economic History* 3 (1974) p.285. G. Kearns, 'The Urban Penalty' in A. Brändström and L.G. Tedebrand (eds.), *Society and Health during the Demographic Transition* (Stockholm: Almqvist and Wiksell, 1988) T. McKeown and R.G. Record, "Reasons for the Decline of Mortality in England and Wales during the Nineteenth Century" *Population Studies* 16 (1962) pp.94 - 122.

problems when attempting to investigate urban-rural mortality differentials. The existence of registration sub-districts can override some of these difficulties, and more importantly, they can be used to distinguish between intra-urban areas with different socio-economic profiles. However, Liverpool, Belfast and Glasgow are not directly comparable on this level.

Liverpool's series of vital registration data starts in 1838. The urban area of the city is covered by three registration districts. The Liverpool RD is entirely urban, covering the oldest parts of the town. It is made up of 7 sub-districts. The West Derby and Toxteth Park RDs cover the periphery of the town, and are progressively urbanised during the nineteenth century. They are made up of 8 and 1 sub-districts respectively. Vital registration data is available for Glasgow from 1858, which unfortunately comes after one of the most interesting periods from a sanitary point of view - the introduction of the Loch Katrine water supply. There is one primary registration district which covers Glasgow, and this is comprised of 14 sub-districts. Belfast's data series does not begin until 1863. Thereafter it appears in the annual reports split by the two counties it straddles - Antrim and Down. There is no data for sub-districts within the city.

For each of the three cities there are supplementary sources for demographic data, but with considerable variations in both quantity and quality. Liverpool has the best sources in the form of the annual reports of the Medical Officer of Health, as discussed above. These begin in 1848 and contain data for the wards of the Borough of Liverpool arranged by age and cause of death (but not the two criterion combined). They are not directly comparable with the data in the Registrar General's reports as the registration districts were not coterminous with the ward and borough boundaries. The MOH reports for three years in the 1850's are missing, but after this gap there is a complete run of data for the rest of the century. The reports also give more subjective information, such as theories on the spread of disease and how the municipal authorities attempted to deal with rising mortality rates. In addition, Liverpool has a number of special reports on the mortality crises which shook the city in the nineteenth century, and these have been incorporated into the disease-specific sections of this chapter where appropriate.

In Glasgow there is also some supplementary demographic data from the few reports of the Medical Superintendent of Health in the 1860's, but they add little more information than the reports of the Registrar General provide. The Glasgow Bills of Mortality were used by Flinn provide some detail for the pre-registration period.<sup>2</sup> There are some special reports, especially for the 1850's from Strang on vital statistics, and

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<sup>2</sup> M.W. Flinn (ed.), *Scottish Population History: From the 17th Century to the 1930's* (Cambridge: Cambridge University Press, 1977)

the work of Russell also documents changes in mortality patterns.<sup>3</sup> Belfast has relatively limited additional demographic information. The annual reports of the Medical Superintendent of Health from 1896 give some data, and there are also the reports produced by Malcolm in the 1840's, which attempt to quantify the cholera mortality during epidemics. However, the following quotation echoes the desires of present day demographers

I cannot give you any information as to the causes assigned...nor can I tell anything regarding the age, sex, occupation or place of abode (except the Registrar's District) of the persons who died. I regret that this should be so. In nearly all our cities and large towns the Medical Officer of Health knows all these particulars, and is able to point out the districts in which an abnormal amount of mortality occurs. hence he able more particularly to look after the sanitation and surroundings of the persons living therein...<sup>4</sup>

By the middle of the nineteenth century there were sufficient data to investigate the changing demographic patterns within the British Isles. A pattern of population growth had been established during the long eighteenth century, with growth rates increasing from zero to approximately 1.73 per cent per year.<sup>5</sup> However, this basic picture of a constantly growing national population obscures the actual pattern of growth experienced by the different parts of the country and also the urban-rural dichotomy. First attempts to describe the growth of British towns and cities in the nineteenth century were made by Law and Weber.<sup>6</sup> They both made the crucial distinction of urbanised settlement not only on the grounds of size, but also the density of the population and the administration system. Law documented that the total urban population increased from 3,009,260 in 1801 to 28,467,395 in 1911 - an increase from 33.8% to 78.9% of the total population of England and Wales. Industrialisation is given due emphasis as the initial impetus for urbanisation in some areas and as an explanation for the relative importance of regional urbanisation, but although they adequately describe the pattern of urbanisation, Law and Weber's work comes before the period of rigorous historical demography, and the actual mechanics behind the process are left untouched. Among these are the population dynamics of the towns,

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<sup>3</sup> J.B. Russell, *Public Health Administration in Glasgow* (Glasgow: Macmillan, 1905)

<sup>4</sup> H. Whitaker, *Report of the Medical Superintendent Officer of Health for the year 1896* (Belfast, 1897) p.4

<sup>5</sup> E.A. Wrigley and R.S. Schofield, *The Population history of England, 1541-1871: a reconstruction* (London: Edward Arnold, 1981) p.528.

<sup>6</sup> C.M. Law, 'The Growth of Urban Population in England and Wales 1801-1911' *Transactions of the Institute of British Geographers* 41 (1967) p.125. A.F. Weber, *The Growth of Cities in the Nineteenth century* (New York: Macmillan, 1899)

which grew despite having much higher mortality rates than the surrounding rural areas. Recent work by Woods has demonstrated the magnitude of the gap in urban and rural life expectancy, and its implication for national trends.<sup>7</sup> In 1861 the life expectancy of a male baby in Liverpool was only 26 years, while in Okehampton in Devon, a boy born in the same year could expect to live for about 57 years.<sup>8</sup>

Population growth is the result of either a surplus of births over deaths, or is the result of in-migration. As Woods has shown, urban areas must have been the destination for large streams of migrants for significant growth rates to be maintained.<sup>9</sup> National demographic data show that fertility rates increased steadily throughout the eighteenth century to a gross reproduction rate of 3.0, followed by a decline back to 2.0 by 1911, although there was a slight rise in the middle of the century.<sup>10</sup> Part of the explanation for the rise in fertility in the late eighteenth century relates to the rise in nuptiality, which can be partly explained by a decrease in the average age at marriage for females. It has been estimated that up to 75% of the increased growth rate at the end of the eighteenth and beginning of the nineteenth centuries was due to increased fertility rather than decreased mortality.<sup>11</sup>

### 3.3 Crude Mortality Rates

The concern with the mortality component of the demography of the three cities centres on the relationship between urbanisation and public health. Kearns has suggested that the population of towns and cities in the nineteenth century paid an 'urban penalty' in the form of a higher death rate, but that this was progressively reduced during the century by the introduction of radical public health measures, initially effected through legislation dealing with the urban environment and later changing its emphasis to target the individual.<sup>12</sup> The first set of data which is presented for the three cities is the crude death rates.<sup>13</sup> Although this statistical measure now

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<sup>7</sup> R.I. Woods, 'Mortality patterns in the nineteenth century' in R.I. Woods and J. Woodward, (eds.) *Urban disease and Mortality in Nineteenth Century England* (London: Batsford, 1984)

<sup>8</sup> *Ibid.*, p.40

<sup>9</sup> C.J.W. Withers and A.J. Watson, 'Stepwise migration and Highland migration to Glasgow, 1852-1898' *Journal of Historical Geography*, 17 (1991) pp.35-55. R. Lawton, 'Population changes in England and Wales in the later nineteenth century: an analysis of trends by registration districts', *Transactions of the Institute of British Geographers*, 44 (1979) pp.55-74. This is also shown by J.G. Williamson, *Coping with city growth during the British Industrial Revolution* (Cambridge: Cambridge University Press, 1990)

<sup>10</sup> E.A. Wrigley and R.S. Schofield, *op.cit.*, p.528-9.

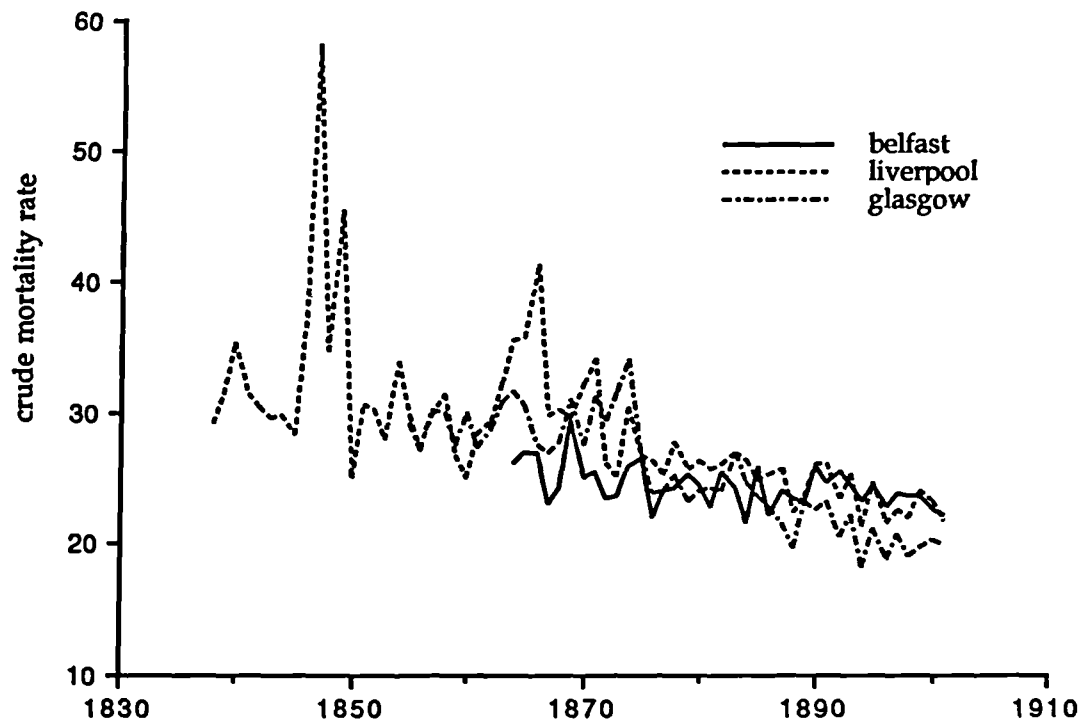
<sup>11</sup> R.I. Woods, *The population of Britain in the nineteenth century* (London: Macmillan, 1991)

<sup>12</sup> G. Kearns, *op.cit.* (1988) p.213

<sup>13</sup> Liverpool comprises the Registration Districts of Liverpool and West Derby, and Toxteth Park from 1881. Glasgow comprises the Central Glasgow Registration District with Barony and Govan. Belfast is a single registration district, with one boundary extension in 1898. The population estimates for inter-censal years has been calculated by apportioning 1/10 of the increase or decrease in population between the census totals for each year. The age-specific mortality rates are constructed from the Registrar General Decennial Supplements to the Annual Reports.



*Figure 3.1 Crude Mortality Rates - Liverpool, Belfast and Glasgow 1838-1901*



*Source: Annual Reports of the Registrars General for England and Wales, Scotland and Ireland 1838-1901*

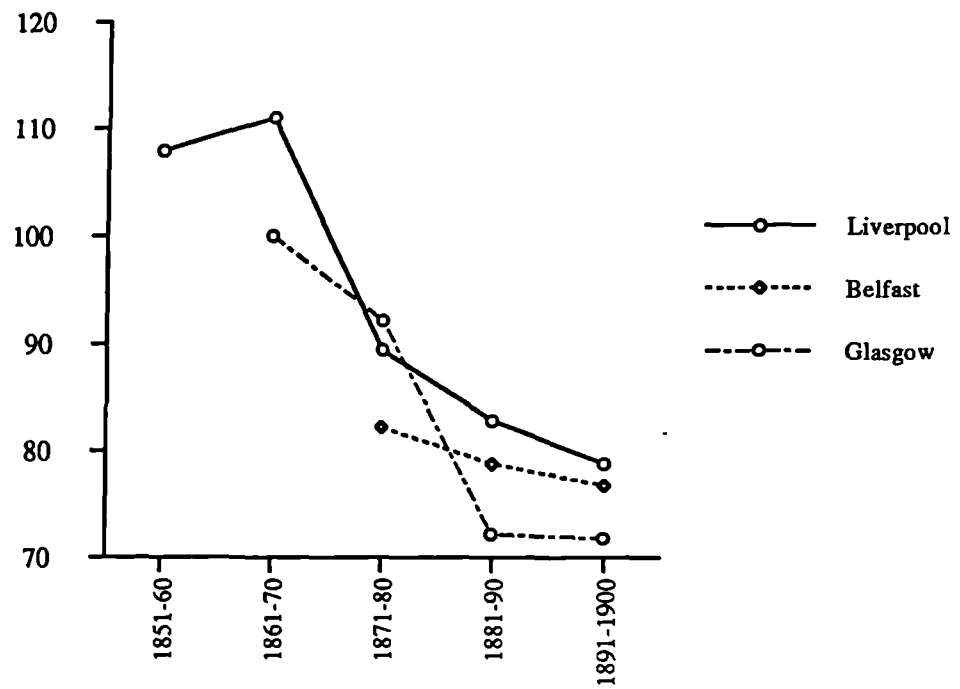
seems primitive and uninformative to us, it is useful to consider, as this is the form in which the performance of the city would have been evaluated in the nineteenth century. There was a perpetual obsession with the 'death league table', in which Liverpool frequently came out with the highest rates. Figure 3.1 shows the relative performance of Liverpool Belfast and Glasgow in terms of their crude death rates. By the end of the century their performance is similar, with a gap of only 1.94 deaths per thousand between the highest (Liverpool) and the lowest (Glasgow). The 1860s and early 1870s show a different picture, with great differences between the cities. In 1866 for example, Liverpool had a crude death rate of 41.3 per thousand, while Belfast was well below this, at only 26.8 per thousand, as it did not experience the typhus epidemic at the same time as Glasgow and Liverpool. Another factor to consider is that Belfast was still considerably smaller than Liverpool And Glasgow at this time, and there may not have been the same level of 'urban crisis'.

### 3.4 Age-Specific Mortality Rates

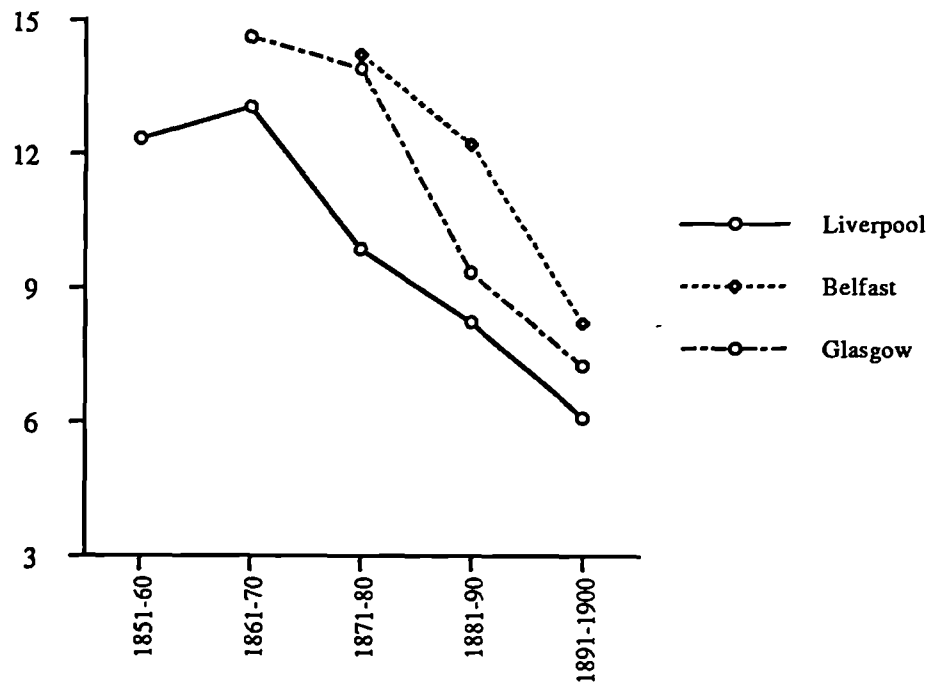
A more illuminating exercise is to look at the age specific death rates for the cities. This is shown in figures 3.2 to 3.8. Average annual mortality rates for ten year periods have been calculated. The under five year olds graph shows improvements for all three cities, although the earlier start to the Liverpool data series shows an increase in the decade 1861-70, which may have also been present in the other two places. This increase in the Liverpool mortality rates in the 1861-70 decade is also seen in the 5-9 and 10-14 age groups, but it is less prominent. Both Glasgow and Belfast have higher rates for the 5-9 age group than Liverpool, which is a reversal of the situation for the under five year olds. The graph for the 10-14 age group shows the progressive improvements in mortality rates, with Belfast in a relatively poor position, and this is continued into both the 15-19 and 20-24 age groups. The 25-44 graph highlights the favourable rates for Glasgow, as well as a return of the mortality peak in the 1861-70 decade for Liverpool. Belfast remains the city with the highest mortality rates. The final graph is for the population over the age of forty five. Glasgow's performance is considerably better than that of the other two cities, with rates of between 58 and 68 per 1000, compared with Belfast which ranges from 82 to 86 per 1000. Again the peak in 1861-70 is visible for Liverpool. The contrast between the youngest and oldest age groups is clear. The under five year olds start the period with high levels, but show a marked improvement. The graph for the over forty five age group is much flatter, and in fact both Glasgow and Liverpool finish the period with roughly the same rates that they started with.

Dis-aggregating the mortality data into age specific bands thus highlights an important factor in the population growth debate. Improvements in certain age groups

*Figure 3.2 Decennial age-specific mortality rates - ages >5*



*Figure 3.3 Decennial age-specific mortality rates - ages 5-9*



*Figure 3.4 Decennial age-specific mortality rates - ages 10-14*

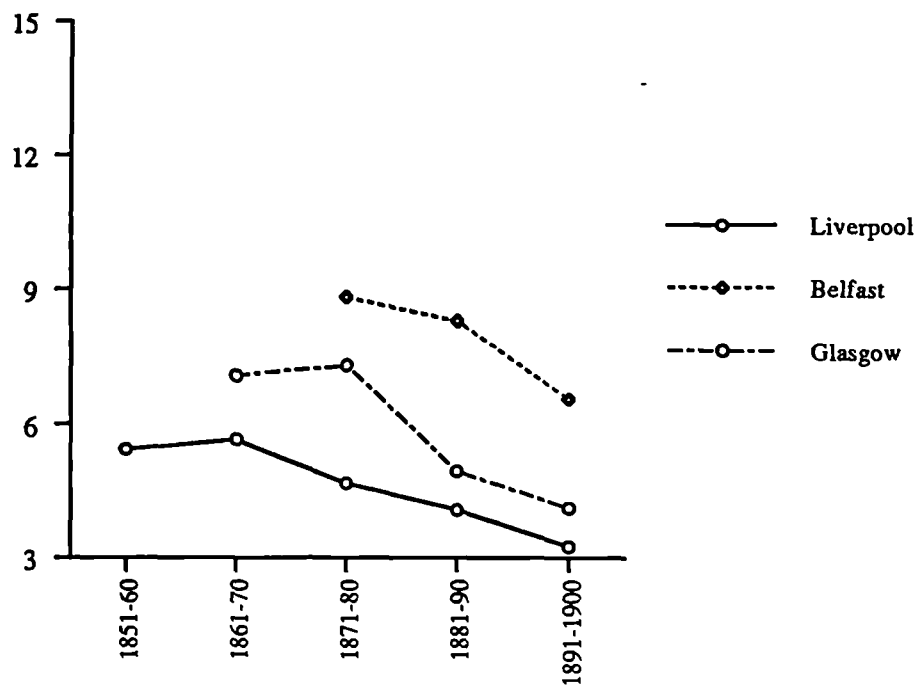


Figure 3.5 Decennial age-specific mortality rates - ages 15-19

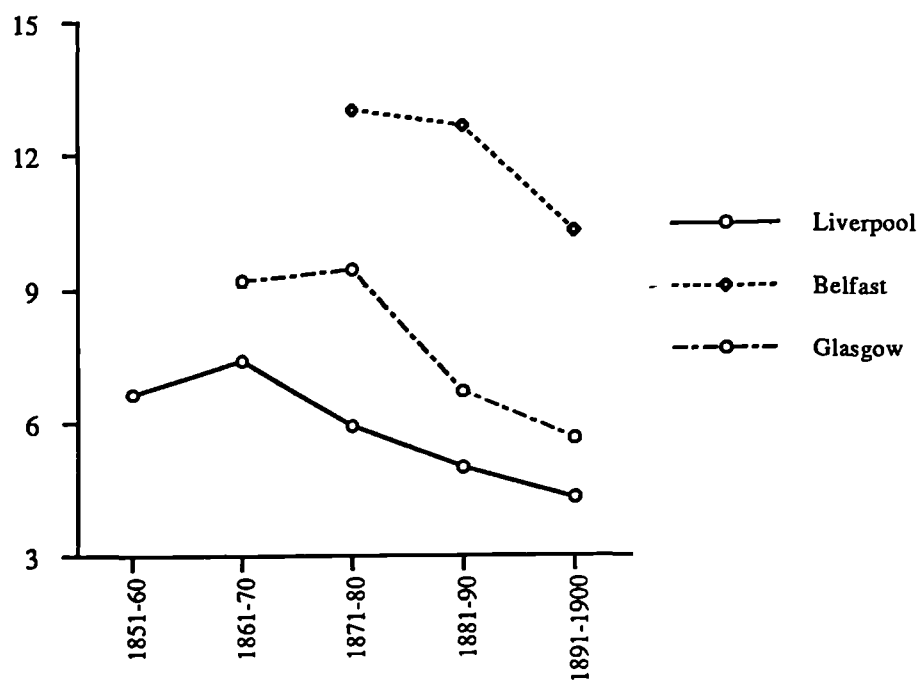
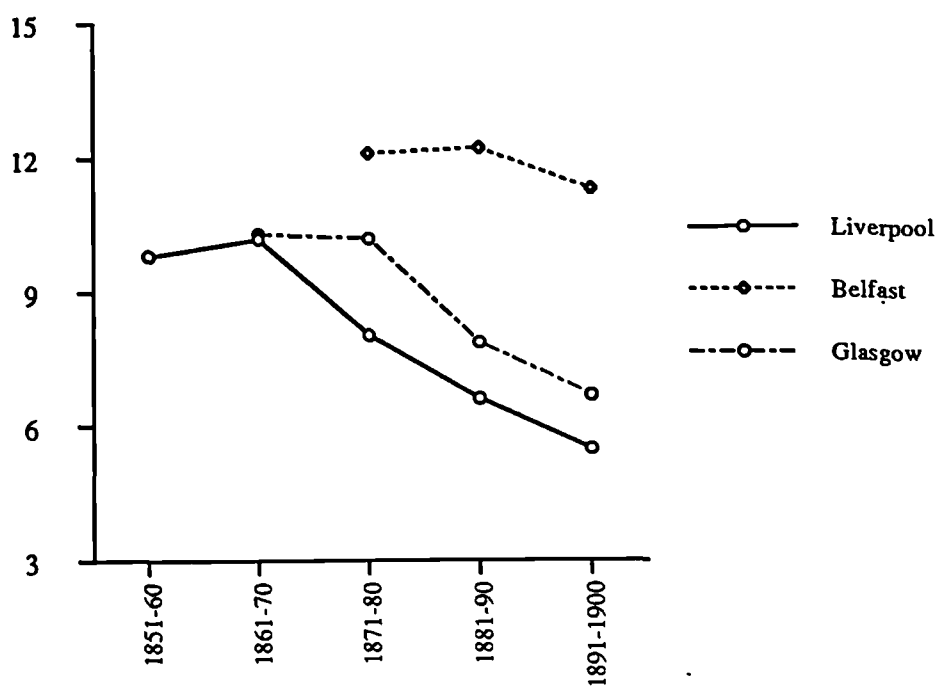
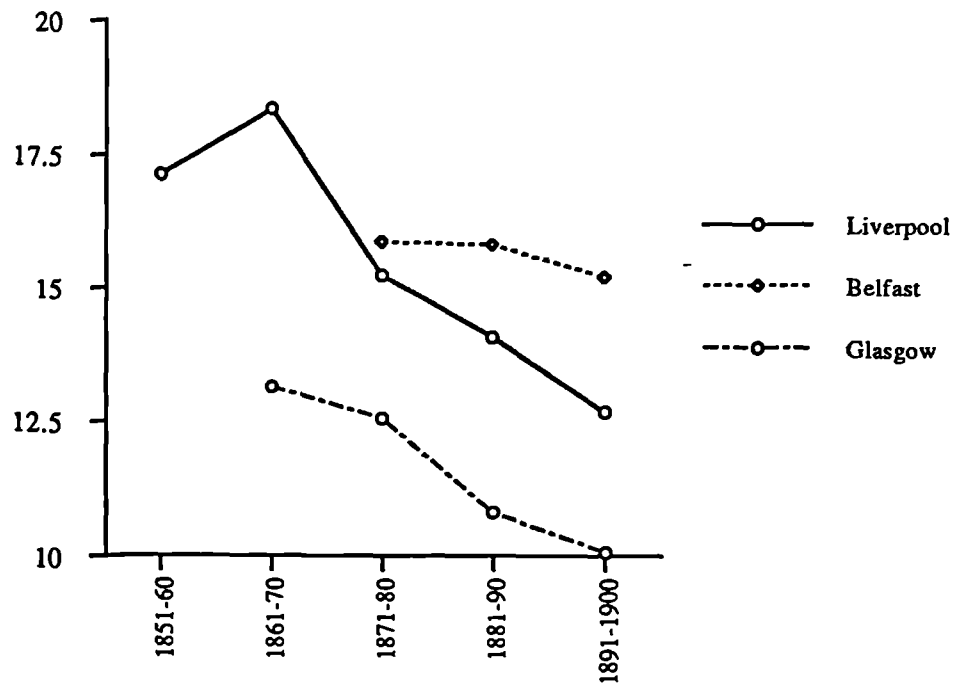


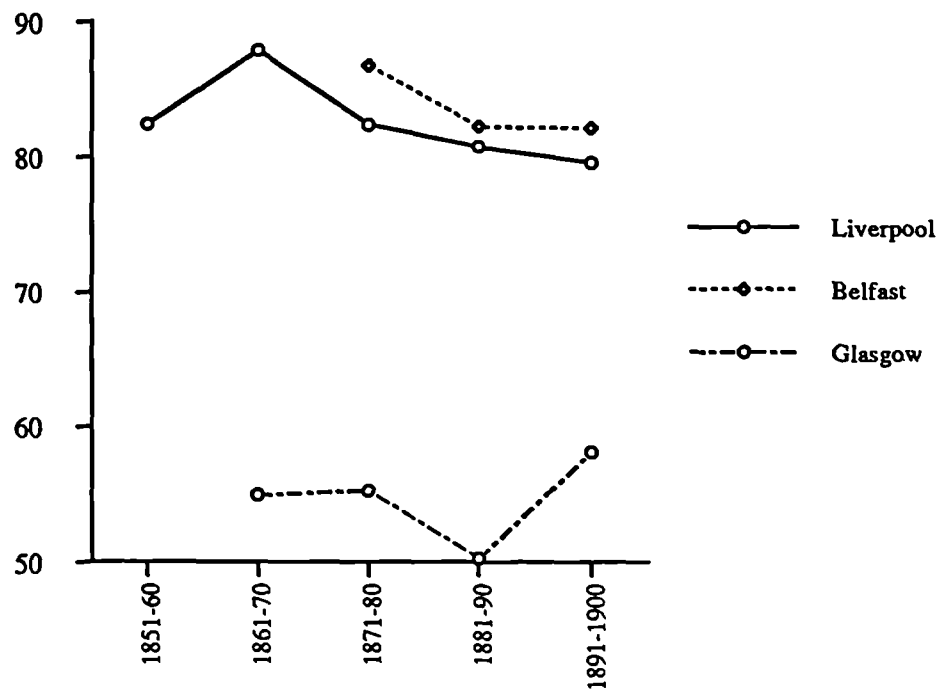
Figure 3.6 Decennial age-specific mortality rates - ages 20-24



*Figure 3.7 Decennial age-specific mortality rates - ages 25-44*



*Figure 3.8 Decennial age-specific mortality rates - ages <45*



will have had differing effects on population growth. If childhood mortality is reduced, there will be more people passing into the reproductive age group. Improvements in the mortality for the over 50s are thus less effective in stimulating population growth, or urbanisation.

### 3.5 Infant Mortality

When considering age specific mortality, the most interesting group to investigate is the infants, or more accurately children under the age of one, because of their enormous contribution to overall mortality. Furthermore, when specific diseases are considered, the most important ones, from a public health perspective, are also those which primarily affect the infant population. Thus any improvement in the mortality of the infants will have a greater impact on the population at large and vice versa. A dramatic improvement in a disease such as phthisis which does not occur to such a great degree in infants will not have such a dramatic impact on the life expectations at birth.

Figure 3.9 shows the pattern of infant mortality for the three cities. The pattern is quite distinct from that shown in the decennial age specific mortality graphs, in which grouping infants with children under five years old dampens down the highest rates. Liverpool and Glasgow both exhibit a decline during their data series, but Belfast actually increases, and Glasgow shows a rise in the 1880s. This is discussed by Chalmers, who places emphasis on poor domestic sanitation, and the lack of a privy conversion project, which was not started until the 1890's.<sup>14</sup> Laxton and Williams<sup>15</sup> make the observation that it is difficult to accept any behavioural explanations for changes in infant mortality and that it is even risky to apportion deaths between the commonly promoted causes of child-rearing practices, environmental factors and epidemic diseases. However, with age/cause-specific data such as that available for Liverpool and Glasgow it is possible to see that the mortality rate from diarrhoea increased in the 1890s due to a series of hot summers, thus confirming the Woods, Watterson and Woodward hypothesis.<sup>16</sup> Laxton and Williams also draw attention to the problem of Victorian Registration Districts which rarely coincided with precise urban boundaries. The commonly adopted procedure to overcome this problem is to take a collection of RDs covering a wider geographical area than the town or city in question.

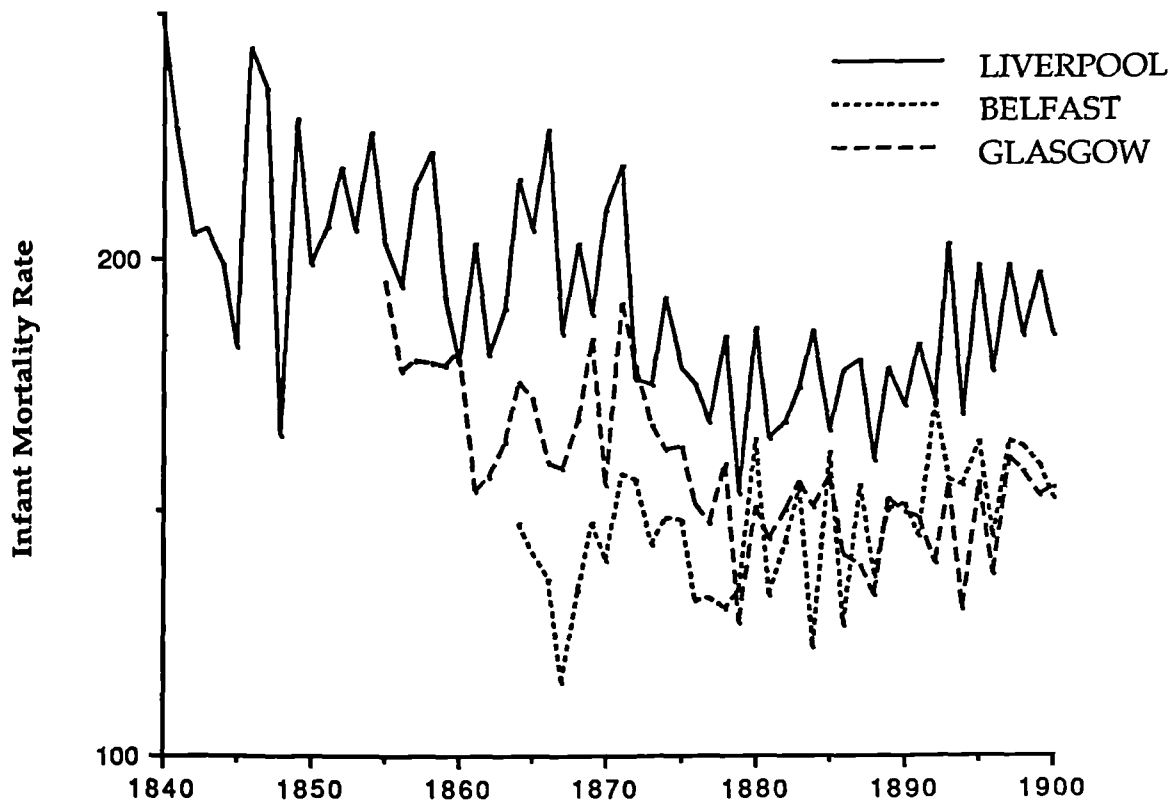
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<sup>14</sup> A. K. Chalmers, *The Health of Glasgow 1818-1925* (Glasgow corporation, 1930) p.11. The introduction of water closets to replace ashpits was possible after the 1890 Police Act.

<sup>15</sup> P. Laxton and N. Williams, 'Urbanisation and Infant Mortality in England: A Long term perspective and review' in J. Rogers and M.C. Nelson, (eds.) *Urbanisation and the Epidemiologic Transition* (Uppsala: University of Uppsala, 1981) pp.109-135

<sup>16</sup> R.I. Woods, P.A. Watterson and J. Woodward, 'The Causes of Rapid Infant Mortality Decline in England and Wales 1861-1921' *Population Studies* Part I 42 (3) (1988) pp.343-366, Part II 43 (1) (1989) pp.113-132

*Figure 3.9 Infant Mortality Rates - Liverpool, Belfast and Glasgow 1850-1900*





This will undoubtedly include a rural portion but it should ensure that none of the built up area is missed. In the case of Liverpool, as illustrated by Laxton and Williams, the effect of amalgamating the West Derby, Toxteth Park and Liverpool RDs is to reduce the infant mortality rate from 225 per thousand (Liverpool alone) to 175 per thousand in 1885.

The national trend for infant mortality shows a dramatic decline in the 1900s, but this is accentuated by the increasing infant mortality of the 1880s. There is also a spatial dichotomy, with the urban districts showing a greater decline than the rural areas, even when RD boundary problems have been accommodated. There is still however a wide variation in rates between urban areas, thus supporting the wish:

to swing the balance of debate back towards the external, political set of factors and away from the internal, domestic explanations which place the blame, at least in part, on the mothers - whether victims of circumstances or not.<sup>17</sup>

Thus implications of this variation must be considered for the three cities studied here. It is evident that they do not all experience a standard pattern of urban infant mortality trends, which the Woods et al. model would imply. There must have been important local factors to account for deviations from the 'national-urban' pattern. Ideally one would hope to find detailed local investigations of the proportion of mothers who breastfed, and the extent of wet-nursing. There is limited information for Liverpool, but the subject did not provoke similar studies in Glasgow and Belfast. However, the conclusion must initially be that the health experience for those under the age of one did not improve as much as for those in the under five age group during the second half of the nineteenth century. Woods et al. thus summarise the position - that infant mortality did not respond to the same factors as those which influenced childhood mortality decline, or was prevented from declining by new factors specific to the circumstances of infants. Their investigations also conclude that the declining infant mortality of the 1890s was due to changes in the post neo-natal rate as the neo-natal rate has remained relatively constant throughout the period.<sup>18</sup> This delay in mortality improvements must suggest that at least part of the explanation lies with infant feeding practices, but again we cannot rely on a standard definition of 'infant feeding'. Weaning times varied with culture, and employment structures determined levels of wet nursing. Woods et al. also identify in their study internal urban variations in infant mortality which are closely correlated with levels of poverty and population density.<sup>19</sup>

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<sup>17</sup> *Ibid.*, p.118

<sup>18</sup> R.I. Woods and J.Woodward, *op.cit.* p.30

<sup>19</sup> R.I. Woods, P.A. Watterson and J.H. Woodward, *op.cit.*, Part II p.358

The conclusions drawn on the timing and cause of infant mortality decline are that the decline would have been observed much earlier (i.e. the 1880s as in Europe) if the 'urban effect' in England and Wales had not combined with the hot summers of the 1890s to sustain deaths from diarrhoea. The primary explanation for the eventual infant mortality decline must therefore lie with changes in the 'urban effect' such as sanitation, environment, levels of overcrowding and urban poverty. The effects of breastfeeding have been debated by many demographers and social/medical historians as well as by nineteenth century commentators. It would seem that the majority of urban mothers were aware of the advantage they were giving their infants through breastfeeding, but the data on how many actually practised this ideal, or who considered additional family income more beneficial, is tantalisingly scarce. Where information is available, as for Liverpool from Hope's 1899 study,<sup>20</sup> it is difficult to evaluate the effects of mixed feeding or shortened periods of breastfeeding. Woods et al. however, accept that breastfeeding was an important influence on infant mortality, and in the process eliminate the suggestion of Beaver that it was the introduction of clean cows milk supplies that promoted the improvement in infant health. If the majority of children were breastfed, the scope for improvements via cows' milk are limited from the outset. Secondly, as demonstrated by Newsholme, a more important factor than the purity of the milk as ensured by pasteurisation, was the cleanliness of the home.<sup>21</sup>

This leads one back to the initial suggestion by Laxton and Williams that a multi-factor explanation of changes in infant mortality is the only plausible solution. Woods et al. have shown the influence of the 'urban - sanitary - diarrhoea - effect', and also the variations caused by social group, poverty and feeding practices. But the final analysis must suggest that until improvements in public hygiene (water and sewerage systems) were replicated by improvements in domestic hygiene (water closets, clean food storage and preparation) there was no likelihood of infant mortality declining.

### 3.6 Diarrhoea

In the general discussion above, the terms infant mortality and diarrhoeal mortality could almost be interchangeable, and much of the debate on the relationship between the two has been covered. Thus this section of the chapter will focus on the identification and analysis of diarrhoea which was undertaken by the nineteenth century medical authorities, and on how the three cities responded to the perennial threat of diarrhoeal mortality. This discussion is central to the thesis hypothesis of the

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<sup>20</sup> E. W. Hope, *Health at the Gateway* (Cambridge: Cambridge University Press, 1931)

<sup>21</sup> A. Newsholme, *Fifty Years in Public Health: a Personal Narrative with Comments* (London: Allen and Unwin, 1935) p.173

formulation and exploitation of the relationship between dirty diseases like diarrhoea and poor sanitation, and its role in the introduction of public health measures.

As early as 1859 a Privy Council study concluded that deaths from diarrhoea were connected with either atmospheric or water pollution.<sup>22</sup> Following the revisionist studies of William Budd, William Ord, Edward Greenhow and John Snow the connection between water and disease was formalised. Luckin states that:

'by the early 1880's London Medical Officers were regularly identifying unsafe company water by way of widespread outbreaks of diarrhoea.'<sup>23</sup>

Diarrhoea was endemic and seasonal rather than epidemic. The majority of deaths from this cause were in young children or infants, therefore in cities which had a proportionally large share of infants, the deaths from these diseases was unduly high. Diagnosis of diarrhoea was problematical in the first half of the nineteenth century, promoting the claims of some of the medical profession that it was a new disease.<sup>24</sup> Diarrhoeal symptoms include rapid loss of bodily fluids, fever and abdominal pain. Death may ultimately be due to convulsions or dehydration, as in cholera. Luckin shows why we must not underestimate the impact of diarrhoea:

'Diarrhoea, in other words, continued to be a massively resilient and destructive disease in nineteenth century Britain. It accounted for over a thousand mainly infant lives in London in 1850, over two thousand in 1875, and just under three thousand on 1900. During the traumatic epidemic of 1911 it killed over four and a half thousand - a death toll comparable with that attributable to cholera during the final metropolitan outbreak in 1866.'<sup>25</sup>

As Flinn states, though, it did not seem to attract as much attention from the medical officers or the Registrar Generals as the more 'frightening' diseases like whooping cough or scarlet fever.<sup>26</sup> As a proportion of total infant mortality, diarrhoeal mortality increased nationally from 10% in the 1880 decade to 30% in 1911.<sup>27</sup> However, there were problems with mis-diagnosis, particularly with dysentery. This is reflected in the way in which the Registrar-General's nosology fluctuated during the period. For the two decades 1861-70 and 1871-80 deaths from the two diseases were classified separately, but between 1881 and 1900 there is a reversal to the earlier format in which the deaths are reported together. Certainly, the symptoms of dysentery were similar to

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<sup>22</sup> PP XXXIV PT. 1. 1860. P.60

<sup>23</sup> B. Luckin, *Pollution and Control; a social history of the Thames in the nineteenth century* (Bristol: Adam Hilger, 1986) p.111

<sup>24</sup> *ibid.*, p.100

<sup>25</sup> *ibid.*, p.102

<sup>26</sup> M.W. Flinn, *op.cit.* p.396

<sup>27</sup> R.I. Woods, *The Role of Public Health Initiatives in the Nineteenth Century Mortality Decline* (Health Transition Workshop 1989) p.8

those of diarrhoea, and it is possible that the Registrar-General's caution imitates the confusion of the doctors making the diagnosis. However, dysentery was an older person's disease, and the mortality rate declined considerably during the second half of the century.

McKeown and Record note that most of the decline in deaths from diarrhoea occurred in the period 1911 to the 1930s when improvements like the pasteurisation of milk, the introduction of dried foods for infant feeding and better education on infant health care for mothers was introduced.<sup>28</sup> The explanation by Woods et al. is however contrary to this and is described in the section on infant mortality above. Improvements in water supply, sewerage systems, and improved nutritional state would all have had an impact in determining the ratio between mortality and morbidity. Wohl carefully approaches the question of whether there was a correlation between bottle-fed babies and diarrhoea.<sup>29</sup> Contemporary reports from the late nineteenth century, such as that issued by Dr. Hope, the M.O.H. for Liverpool, implied that it was the mother's duty to breastfeed. He stated that the death rate of bottle fed babies in Liverpool was 15 times greater than that for breastfed babies.<sup>30</sup> One of the other factors recognised by contemporaries as responsible for 'summer diarrhoea' was the use of unwashed plates and cooking utensils, and leaving food uncovered which led to the transmission of disease by flies. A corollary to this was the inefficient collection of sewage and the use of cesspits which hosted the large population of flies. Trench, the MOH for Liverpool, warns of the dangers of the privy, especially in the context of infants

The little creatures sit and idle away time in those receptacles of filth, climb on seats stained with dejections and even pursue their infantile games on the floor beneath the pestiferous shelter of the roof.<sup>31</sup>

How does the experience of the three cities compare ? From the data presented in figure 3.10 the immediate conclusion that is reached is that the disease was most important in Liverpool. It can be clearly seen that the late 1860s was a crisis phase in the city, with mortality reaching 2.36 per 1000. The national trend of increasing mortality in the 1890s is also apparent. Glasgow experiences a smaller decline throughout the period, but does not show the same rise in mortality in the 1890s. Russell's analysis of the decline in mortality from diarrhoea in Glasgow strongly states the role of a pure water source.<sup>32</sup> Diarrhoeal deaths as a percentage of all deaths fell

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<sup>28</sup> T. McKeown and R.G. Record, *op.cit.* (1962) p.417

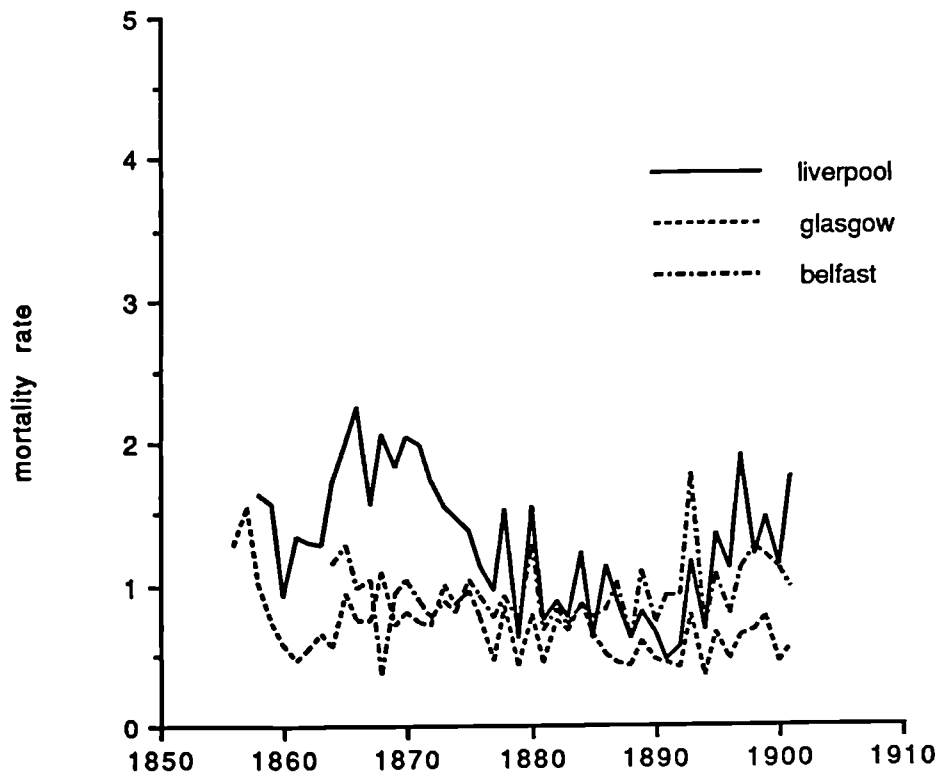
<sup>29</sup> A.S. Wohl, *op.cit.*, p.24

<sup>30</sup> E.W. Hope, 'Observations on Autumnal Diarrhoea in Cities', *Public Health*, July 1899 p.662

<sup>31</sup> W. Trench, *Annual Report of the Medical Officer of Health for the year 1866* (Liverpool, 1867) p.31

<sup>32</sup> J.B. Russell, *op.cit.*, p.357-363

*Figure 3.10 Diarrhoeal mortality rates - Liverpool, Belfast and Glasgow 1851-1901*



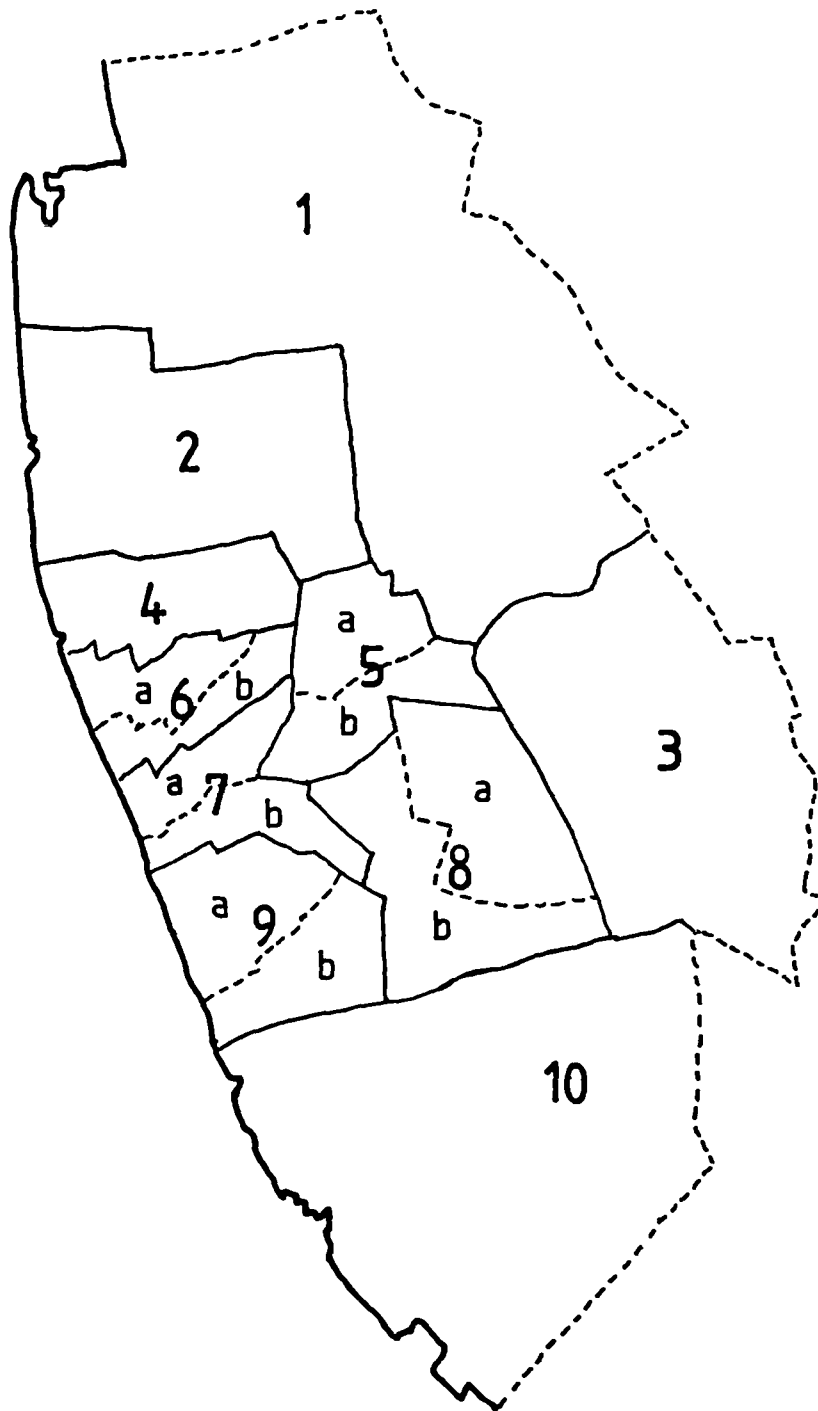
from 12% in the 'polluted Clyde water period' 1838-44, to 4% of all deaths by 1868. He attributes the sudden decline in the 1860's to the introduction of Loch Katrine water, although he identifies that the 'saving' in mortality is made in the older age groups. Other improvements which helped to reduce the mortality rate from diarrhoea in Glasgow included the formation of the Corporation Cleansing Department in 1868, the establishment of a system of inspection for nuisances and their removal in 1870, the erection of the Refuse Despatch Works in 1881 and the abolition of the privy system in 1890.<sup>33</sup> However, after the change from privies to water closets, the Committees on Health and Cleansing assumed that they could reduce the amount of time they put into hosing down the backyards and communal areas. This proved to be a little premature, as it took a number of years for the water closets to be used properly, and some of these yards reverted to their former filthy states when the corporation cleansing services had been removed. The pattern for Belfast is similar to the other two cities, with an average rate of 1.24 per 1000 for the early period, but also rising in the 1890s.

A more detailed analysis of the changing rates of diarrhoeal mortality has been undertaken for Liverpool, which has an excellent series of data in the form of the annual reports of the Medical Officer of Health, with intra-urban dis-aggregations. For Glasgow and Belfast the Annual Returns to the Registrar-Generals are the only consistent source of information, and this does not include any data for specific urban districts. Figure 3.11 shows the division of Liverpool into districts and municipal wards. The subsequent figures 3.12 and 3.13 group the districts into 'good' and 'bad' graphs according to their diarrhoeal mortality rates. The patterns which emerge reinforce the theories of Duncan on the correlation between disease and environment, and more subjectively, between disease and standard of living. The districts with the lowest rates of diarrhoeal mortality include Mount Pleasant, St George and West Derby, which are all recognised as being predominantly upper class and/or in a good sanitary condition. This condition is defined as having an efficient water and sewerage system to which all houses on the district are connected or, as in the case of West Derby district, having been recently urbanised so that all the housing stock is of good quality and the area is well planned with consideration for ventilation and sanitation. Figure 3.13 shows the districts of Liverpool which had the highest rates of diarrhoeal mortality. These include Howard Street and St Martin - both located in the core of the old urban area and consequently constructed before the era of building and planning regulations. This type of housing stock was the cheapest available and thus occupied by those in the lower socio-economic groups. It is in these districts of Liverpool where Duncan and his successors find the highest proportion of cellar dwellings, and the most basic of sewerage and refuse removal systems.

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<sup>33</sup> A.K. Chalmers, *op.cit.*, p.285

Figure 3.11 Liverpool Districts 1849, showing ward sub-districts



1 Mile

- |                   |  |
|-------------------|--|
| 1. Everton        | (Everton Ward)                         |
| 2. St. Martin     | (Scotland Ward)                        |
| 3. West Derby     | (West Derby Ward)                      |
| 4. Howard Street  | (Vauxhall Ward)                        |
| 5. Islington      | (St Anne Street and Lime Street Wards) |
| 6. Dale Street    | (St Pauls and Exchange Wards)          |
| 7. St George      | (Castle Street and St Peters Wards)    |
| 8. Mount Pleasant | (Abercromby and Rodney Street Wards)   |
| 9. St Thomas      | (Pitt Street and Great Georges Wards)  |
| 10. Toxteth Park  | (North and South Toxteth Wards)        |

The two sets of graphs illustrate the wide range of diarrhoeal mortality experiences in a nineteenth century British city. The peak of the 1866 epidemic is seen most clearly in the 'bad' district of Howard Street where the rate reached 5.5 per thousand. meanwhile in the 'good' district of Mount Pleasant the rate barely shifted from the pre-1866 level of 1.1 per thousand. The end of the period illustrates the degree of convergence in intra-urban mortality rates, although Howard Street maintains its bad reputation.<sup>34</sup> Even the 'good' districts in the 1890's show some increase in mortality, which lends support to the hypothesis of Woods et al. that some non-domestic factors must be at work.

Diarrhoea mortality featured frequently in the reports of the Medical Officers of Health for Liverpool in the context of public health requirements. Trench in 1864 makes the correlation between the summer droughts and the increase in infantile diarrhoea and goes as far as to include detailed meteorological reports in the same table as the deaths from diarrhoea. He concluded that

There are many ways in which summer rain-fall may affect health...Thunder showers in the latter weeks of June, or in July and August, by flushing out the sewers when their emanations are most to be dreaded, will have a more favourable effect in this manner on health than ten times the quantity of rain in September or October. This should be a very potent argument for using the water of the Mersey in the flushing of sewers, as the months when this operation is most needed on sanitary principles are those in which the quantity of water for the purpose can least be spared from the Rivington Lakes.<sup>35</sup>

He reiterates this correlation to the special investigation the Health Committee held in 1865.<sup>36</sup> Duncan had also made the observation that the districts most affected by diarrhoea were those in which other 'dirty' diseases were also most prevalent. In his first report, which covers the years 1847 to 1850 Duncan tabulated this correlation by listing the wards of Liverpool in which diarrhoea and fever were 'most fatal relatively to the population of each ward'<sup>37</sup>

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<sup>34</sup> Changes in the presentation of the data in 1891 prevent the production of graphs for some of the districts.

<sup>35</sup> W.S. Trench, *Annual Report of the Medical Officer of Health for the year 1864* (Liverpool, 1865) p.45

<sup>36</sup> Minutes of Evidence Taken Before the Sub-Committee of the Health Committee Appointed to Inquire and Report as to the Causes of the Excessive Mortality of the Borough and as to the Means to be Adopted for Mitigating the Same (Liverpool, 1865) p.11

<sup>37</sup> W.H. Duncan, *Annual Reports of the Medical Officer of Health for the years 1847-48-49-50* (Liverpool, 1851) p.13



Figure 3.12 Diarrhoeal mortality - Liverpool 'good' districts  
1864-1901

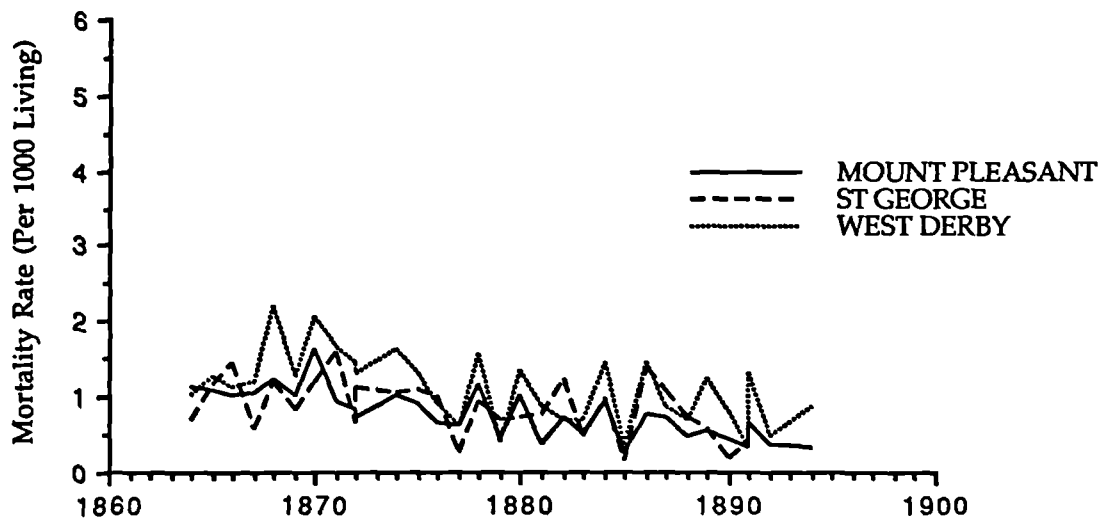
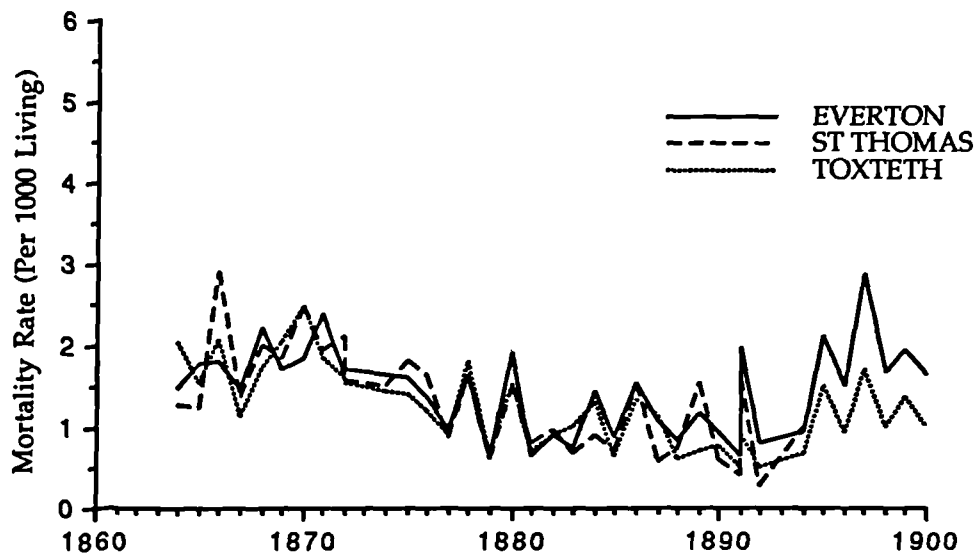


Figure 3.13 Diarrhoeal mortality- Liverpool 'bad' districts  
1864-1901

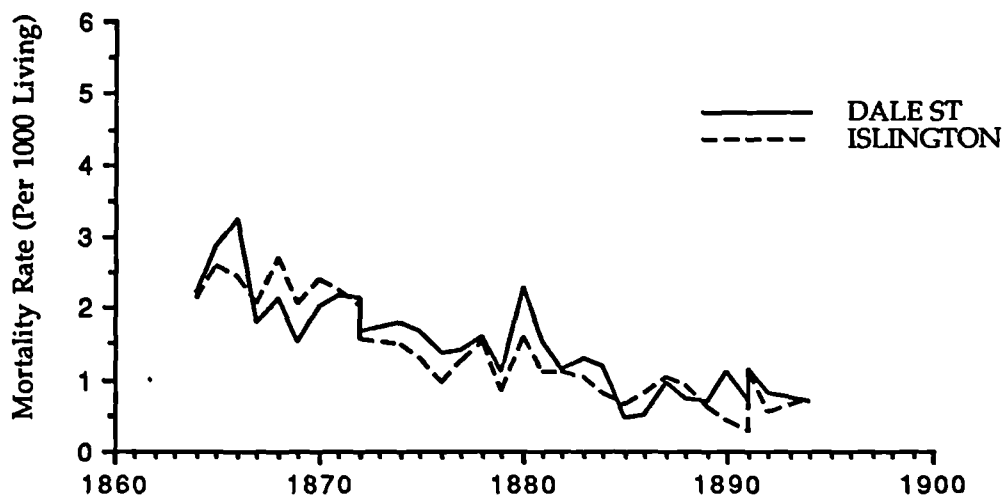
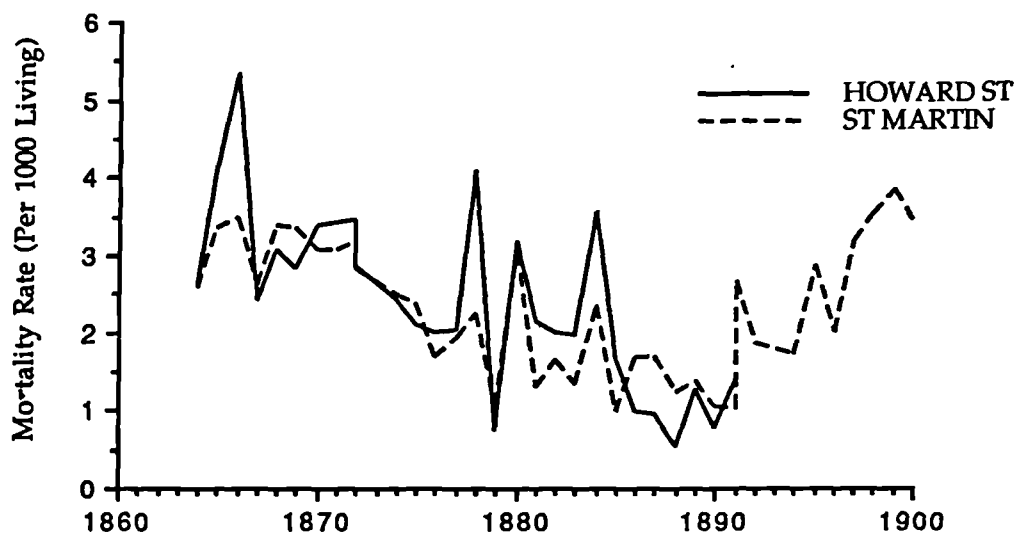


Table 3.1 Duncan's Listing of Wards by Diarrhoea and Fever Mortality

<i>Fever Mortality</i>	<i>Diarrhoea Mortality</i>
Vauxhall	Vauxhall
Exchange	Exchange
Great George	Great George
Scotland	Scotland
St. Anne's	St. Peter's
St. Paul's	St. Paul's
Castle Street	St. Anne's
Pitt Street	Pitt Street
St. Peter's	Castle Street
Lime Street	Lime Street
Abercromby	Rodney Street
Rodney Street	Abercromby

The endurance of diarrhoea as a sanitary test is illustrated by its use in a number of articles published in 1900 in the journal *Public Health*. The meteorological rhetoric is still evident, with discussions of atmospheric and earth temperatures as the stimuli for epidemics, but there is more awareness of the correlation with methods of sewerage and refuse removal. Cameron cites the case of Leeds, where in 1899 high temperatures were not accompanied by high diarrhoeal mortality rates. He lists a number of improvements which reduced the possibility of epidemic diarrhoea, including more frequent emptying of ashpits, placing disinfectant in water closets and flushing the sewers. His check on this correlation is provided by the South Eastern part of Leeds, where more attention had been directed, and where there has been a greater fall in the diarrhoeal death rate.<sup>38</sup> Likewise the report of Wilkinson on diarrhoea in northern towns also shows a shift in ideology towards domestic sanitation as a controlling factor in diarrhoeal mortality. In Oldham, where he is the MOH the fatality rate is 1 per 708 houses with water closets, but rises to 1 per 214 houses with sanitary pans (the equivalent of ashpits).<sup>39</sup>

Diarrhoea was therefore used as a sanitary argument for the introduction of a number of systems, the most important of which were water supply and sewerage. The intra-urban comparisons which were favoured by the MOHs aided the identification of the correlation between diarrhoea and insanitary conditions, although the issue was clouded in the 1890s by the infant feeding debate. Hope's analysis was correct, but his

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<sup>38</sup> J. Spottiswoode Cameron, 'Diarrhoea and Scavenging', *Public Health*, October 1900, p.33

<sup>39</sup> J. Wilkinson, 'Diarrhoea in Northern Towns', *Public Health*, August 1900, p.34

advice to breastfeed and not to wean babies during the summer months did not tackle the persistent problem of 'dirty' environments, whether they be public or domestic.

### 3.7 Cholera

Cholera has been the focus of intensive research for many years, both from an epidemiological perspective and for its role in promoting sanitary reform. This has been highlighted in chapter one, and the evidence presented here, especially for the Liverpool epidemic in 1854, shows how the disease intensified intra-urban authority disputes which were usually hidden from public view. The fact that cholera is a prime example of a water transmitted disease is also useful for investigating the improvement in the purity of water supplies during this period. In Liverpool the actual mortality from cholera was never as significant as that from typhoid fever. In the first cholera epidemic of 1832 the mortality rate in Liverpool was 7.76 per thousand (1523 deaths), during the 1849 epidemic it was 13.68 per thousand (5308 deaths). The subsequent epidemics of 1854 and 1866 had lower rates of only 2.97 per thousand (1290 deaths) and 3.74 per thousand (1989 deaths) respectively.<sup>40</sup> In Glasgow, the first cholera epidemic in 1832 claimed 2842 lives, which translates as a mortality rate of 14 per thousand. The second cholera epidemic of 1848-9, had a mortality rate of 10.6 per thousand (3774 deaths). The 1866 cholera outbreak was subdued in Glasgow, with only 68 deaths. The 1832 epidemic in Belfast had a mortality rate of 9.25 per thousand (418 deaths). In the 1849 epidemic, which was recognised as a more virulent attack, there were 2705 cases of which 997 died. According to Creighton, 'the cholera of 1854 was unimportant in Ireland'<sup>41</sup> but the number of cholera deaths in Belfast was still 563. It was not until the 1866 epidemic, when the number of deaths fell to 33, that the threat of cholera seemed to be waning.

As Kearns has shown, the cholera mortality in British towns and cities was trivial when compared to the rates experienced by continental cities<sup>42</sup> but the public fear was just as great. The annual reports of Liverpool's first Medical Officer of Health, Dr Duncan, illustrate the anticipation of the arrival of cholera in the years after 1832 (the first epidemic). Much of the panic could be attributed to the perceived 'habits' of cholera, in that it was not restricted to the poorer parts of the city, or linked to levels of sanitation as fever seemed to be. Perversely, during the 1854 epidemic, some of the areas of the city which suffered the highest mortality rates had only recently been praised for their sanitary state

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<sup>40</sup> G. Kearns, *Aspects of Cholera, Society and Space in Nineteenth Century England and Wales* (Unpub. Ph.D. thesis, Cambridge, 1985)

<sup>41</sup> C. Creighton, *A History of Epidemics in Britain* (1894) v.2, p.839

<sup>42</sup> G. Kearns, 'Death in the time of cholera', *Journal of Historical Geography*, 15. 4 (1989) p.426

Having during the last twenty-five years had an intimate acquaintance with the conditions of the worst districts of Liverpool, and having made a special inspection of the 'principal cholera districts' in August last (1854), at the time when the epidemic was commencing, I can confidently assert that I have never known them to be in a more satisfactory condition; and as a general rule, the streets and courts presented an aspect of what might almost be called *unusual* cleanliness.<sup>43</sup>

The context in which Duncan supplies this report is central to the theory of the role of cholera in stimulating sanitary reform in nineteenth century urban areas. His report forms part of a statement issued by the Corporation of Liverpool to refute allegations made by the Select Vestry that they had not performed their sanitary operations with enough diligence. The collection of reports and letters that were subsequently printed illustrate the level of co-operation required to cope with the threat of a cholera epidemic.

In anticipation of the 1848 epidemic, the General Board of Health issued a recommendation that Joint Committees be formed in towns to utilise the Nuisances Removal and Diseases Prevention Act. The Joint Committee in Liverpool was composed of representatives from the Corporation Health Committee, the Select Vestry and the West Derby Board of Guardians. The operation required the Parish authorities to inform the Corporation of nuisances and insanitary areas which they encountered on their rounds, and the sixteen Medical Officers were required to inform the Corporation's Medical Officer of Health of the deaths within their districts. The Corporation's Inspector of Nuisances then followed up the complaints in addition to the regular programme of inspection, and the Borough Engineer ensured that the streets and courts were swept and washed. The system worked well in 1849, but in September 1853 when another outbreak was predicted, the Select Vestry was reluctant to resurrect the Joint Committee. It feared that the Corporation would use the occasion to interfere with the responsibilities of the Medical Relief Committee of the Select Vestry. When the cholera appeared in August 1854, Duncan wrote to the Vestry Clerk requesting the names and addresses of the cholera victims, which the District Medical Officers collected for their daily reports. The information was not forthcoming, the excuses that were given were trivial - mislaid letters, the cost of copying the reports, and so on.

The efforts the Corporation made to mitigate the threat of cholera received the approval of the General Board of Health, and the following extract from the Board's letter was printed in reply to the Select Vestry's attack

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<sup>43</sup> W. H. Duncan, Report of the Medical Officer of Health, presented as part of the *Statement of the Health Committee of the Town Council of Liverpool as to Charges Made Against Them by the Medical Relief Committee of the Parish of Liverpool* (Liverpool, 1855) p.18

It is a great satisfaction to the Board to perceive that the Health Committee have acted promptly on this occasion with ENLIGHTENED FORETHOUGHT. The Board trusts that the house to house visitation which the Health Committee have for some weeks past directed to be kept up in the unhealthy districts, will be kept up with unremitting vigilance.<sup>44</sup>

Duncan claimed that of the 664 nuisances reported by the Medical Relief Committee during the period July to October 1854 (the peak of the epidemic), there were only 168 which the Health Committee had powers to abate. All the reports issued during this period in Liverpool testify to the continued efforts of the authorities, and to the persistent attempts of Duncan and his contemporaries to identify the causal link between disease and sanitation. Plans for sewerage of the known cholera districts were brought forward in September 1853 on the orders of Duncan, and the frequency of street washing increased.<sup>45</sup> In the year to 30th September 1854 23,717 street houses and 34,518 court houses in the unhealthiest parts of the town were inspected, and 10,148 notices served to enforce cleaning. Also during this period 61,153 middens and cesspools were emptied by the Corporation contractors.<sup>46</sup> This policy of sanitary surveillance which the General Board of Health actively promoted was based on the theory that if caught early enough, cases of premonitory diarrhoea could be prevented from developing into cholera. Although the explanation proved to be incorrect activities of the Corporation and the other urban authorities at least identified and sought to correct some of the worst sanitary problems in Liverpool.

The cholera experiences in Glasgow and Belfast produced very similar administrative and practical solutions to those outlined above for Liverpool. The 1832 epidemic in Glasgow did not prompt any immediate improvement in sanitation. Although an Inspector of Cleansing was appointed in 1843, there was no Cleansing Department for him to manage until 1868. The second cholera epidemic of 1848-49 is credited as part of the stimulus for the slum clearance programmes which were begun in the High Street and Saltmarket areas of the city.<sup>47</sup> However, the 1853 cholera epidemic found the city unchanged, and nearly two thirds of all the cholera deaths in Scotland took place in Glasgow.<sup>48</sup> The explanations given by Gairdner (the Medical Officer of Health appointed in 1863) for the low rate of mortality from cholera in the 1866

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<sup>44</sup> *ibid.*, p.11

<sup>45</sup> *ibid.*, p.28-30

<sup>46</sup> *ibid.*, p.41

<sup>47</sup> A.K. Chalmers, *The Health of Glasgow 1818-1925: An Outline* (Glasgow: Bell and Bain, 1930) p.11

<sup>48</sup> A. Gibb, *The Demographic Consequences of Rapid Industrial Growth: A Case Study of Glasgow 1801-1914*, (occasional Paper Series No.24, Department of Geography, University of Glasgow, 1988) p. 24

epidemic were the Corporation policies of isolation and disinfection, and the introduction of water from Loch Katrine.<sup>49</sup>

In Belfast, the 1832 epidemic was anticipated with fear. The first case appeared in the town on 29th February 1832, but prior to this a Board of Health had been appointed on 22nd November 1831. A subscription had raised £700 towards the provision of cholera wards at the Fever Hospital. The other contingency measures involved inspection and street cleaning. When the epidemic had passed, the town slipped back into its old ways. The approach to the 1849 epidemic was much the same - fear provoking temporary expediencies, but in the intervening years Malcolm's research into mortality and sanitation had produced very similar conclusions to those of Duncan in Liverpool. He calculated from the census population of 1841 that the average (non-epidemic) mortality rate for Belfast was 28.2 per thousand, and that over half of the population was under the age of twenty years. Over 62,000 people had suffered from fever in the previous 30 years, and of that number 6,000 had died.<sup>50</sup> The fever epidemic of 1847 was severe but at the end of 1847 he issued this warning in the *Belfast People's Magazine*

Our readers will see... that a dreadful calamity is impending and that...we have every reason to expect it among us at no distant period. Are we to fancy that we will escape... we cannot make any impression on its causes...If we remain with our arms folded it will embrace us with a deadly grasp. Cholera is always most virulent where sanitary measures are most neglected.<sup>51</sup>

The activities and strength of the voluntary health movement in Belfast can be seen most clearly during the cholera years. The Belfast Sanitary Committee was formed in 1848 with the consent of the Town Council to enquire into how mortality rates could be lowered, and the general sanitary state of the town improved. Malcolm was the secretary, and his ideas form the substantive part of the report which the committee issued in 1848.<sup>52</sup> The Sanitary Committee divided the town into six districts formed an inspection team for each one to collect information as Malcolm directed. district meetings were held to stress the importance of cleanliness and ventilation, especially to the poorer classes.<sup>53</sup> When cholera was once again expected in 1849, the co-ordination of the Corporation, the Water Commissioners and the Parochial Officers of Health was seen as sufficient precaution, but no sustained attempts at sanitary reform were made

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<sup>49</sup> This is discussed in more detail in chapter four.

<sup>50</sup> A.G. Malcolm, *The sanitary state of Belfast with suggestions for its improvement* (Belfast, 1852)

<sup>51</sup> *Belfast People's Magazine* Vol.1 No.12. 1847 p.280

<sup>52</sup> *Report on the Sanitary State of Belfast* (Belfast: Henderson, 1848) copy in Belfast Public Library ref: BPB 1848.9.

<sup>53</sup> H.G. Calwell, *Andrew Malcolm of Belfast 1818-1856 Physician and Historian* (Belfast: Brough and Dunn, 1977) p.106

The epidemic of 1849 passed away, and very soon the general public seemed almost to have forgotten the lesson so dearly imparted, but, I fear, not learned...the subscriptions on which the Sanitary Committee depended for carrying out their desires and efforts utterly failed, so that by August of 1850 the society, which had been organised for the public benefit, and which had done good service, ceased its operations, having died from apathetic neglect.<sup>54</sup>

The 1854 and 1866 cholera epidemics in Belfast brought about no fundamental shifts in policy, or permanent public health administration. The only improvements that were made were the frequency of reviews. The 1854 epidemic prompted the committee to request weekly reports, but by 1866 the Corporation Sanitary Committee decided to meet every day.

The three cities thus operated very similar policies to cope with cholera. They can be summarised as being essentially surveillance tactics, in which programmes of inspection are focused on the poorest (and dirtiest) districts. These systems required the co-operation of a number of independent urban authorities - usually the Corporation and the Parish, but in all three places when the epidemic passed the agreements to co-operate lapsed. With the later epidemics the local medical profession were able to pinpoint with increasing accuracy those areas which would have the highest morbidity and mortality rates. The correlation with sanitary conditions stimulated greater efforts at cleanliness in anticipation of the epidemics, and also demanded more permanent improvements in sanitation. The importance of an adequate water supply became increasingly obvious.

### 3.8 Typhus

Typhus, typhoid and simple fever have been classified together to make the analysis compatible with the national data, and also because before 1869 the Registrars General did not distinguish between them in the annual reports. McKeown calculated that about 22% of the reduction in mortality in the second half of the nineteenth century was due to these diseases, and that by 1900 the mortality from enteric (typhoid) fever had halved while that of typhus and simple fevers had virtually disappeared.<sup>55</sup>

The infectious organism of typhus is the *Rickettsia prowazeki* is mainly carried by lice and should therefore really be classed as a vector-borne rather than a food/water-borne disease. The method of contagion is either being bitten by infected lice or by

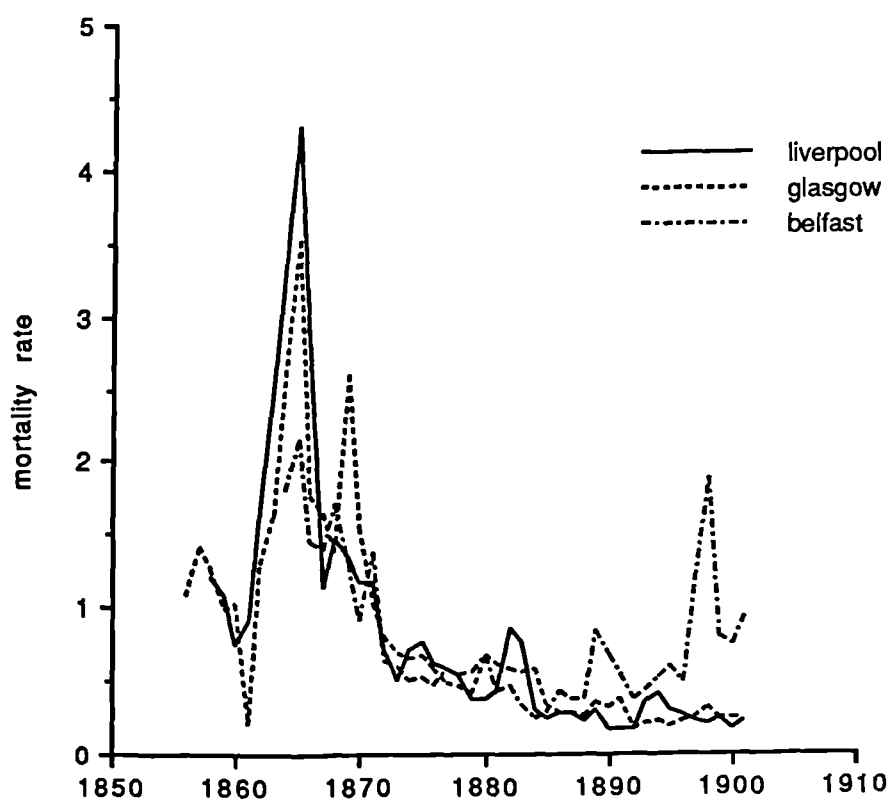
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<sup>54</sup> S. Browne, 'On the Progress of Sanitary Inquiry in Belfast', *Transactions of the National Association for the Promotion of Science*, 1867, p.478

<sup>55</sup> T. McKeown and R.G.Record, *op.cit.* (1962) reprinted in M.W. Flinn and T.C. Smout, (eds.) *Essays in Social History* (Oxford, Oxford University Press, 1979) p.243



*Figure 3.14 'Fevers' mortality rates - Liverpool, Belfast and Glasgow 1851-1901*



inhaling the dust of their faeces which can remain potent for months or even years.<sup>56</sup> Smith states that dust can enter the body through scratches on the skin, through the conjunctiva or by inhalation.<sup>57</sup> The lice can be killed with antiseptics, and the disinfection of patients and their dwellings is usually sufficient to ensure that the disease does not spread. Luckin estimates that the case mortality rate in the nineteenth century for typhus was between 20 and 45%, but that during epidemics this could increase to 50%.<sup>58</sup> Typhus was well in decline before the body louse was identified as the vector in 1909, but even though the early doctors worked without this knowledge, the treatment they developed of disinfection and isolation of patients had the desired effect. The distinction between typhus and typhoid was made in the late 1840's by William Jenner, at a time when the mode of transmission was thought to be contagion, although there was no firm evidence, other than the fact that the districts which presented the largest number of cases were almost invariably overcrowded urban areas, in which there was high population density. Other observations suggested the importance of infected clothing and housing. The Registrar-General did not choose to separately report typhus and typhoid until 1869, although there is evidence that the distinction had been made by doctors certifying the cause of death for some time before this date.

Typhus was also known as 'gaol fever' and 'ship fever' in the eighteenth century and 'Irish fever' in the mid-nineteenth century. This reflects the association of the disease with the Irish, who were blamed with bringing it over from Ireland during the mass emigrations of the early nineteenth century. There were major epidemics in the economically depressed years of 1801, 1812, 1816-19, 1837-8, 1847, 1855, 1862-3, and 1866. By the 1870s typhus was in decline, and there have been several explanations for the timing and the geographical patterns associated with the decline. They include Rosen who suggested that slum clearance, increasing use of baths and wash-houses and rising living standards, and McKeown and Record who based their theory on the twin factors of improving sanitation and better nutrition which increased reduced the case mortality rate.<sup>59</sup> Two recent pieces of research come to different conclusions, which still suggest multi-causal explanations, but give a greater emphasis to two factors. Luckin's analysis produces the hypothesis that it was continuing connections with Ireland which maintained higher rates of typhus in some towns rather

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<sup>56</sup> A. Hardy, 'Urban Famine or Urban Crisis? Typhus in the Victorian City', in *Medical History*, 1988 (32) pp.401-425

<sup>57</sup> F.B. Smith, *op.cit.* p.238

<sup>58</sup> B. Luckin, 'Typhus and Typhoid in London' in R.I. Woods and J. Woodward (eds.) *Urban Disease and Mortality in 19th century England* (London: Batsford Academic, 1984) p.104

<sup>59</sup> G. Rosen, 'Disease, debility and death', in H.J. Dyos and M. Wolff (eds.) *The Victorian City* vol.2. (London: Routledge and Kegan Paul, 1973) p633. T. McKeown and R.G. Record, 'The decline of mortality in the 19th century', *Population Studies*, 1962 (16) p.116

than others, and that these towns were the recipients of Irish migrants who brought renewed infection with them. This 'Irish hypothesis' is also fits well with the contemporary image of the Irish migrant as poor, destitute and possibly mal-nourished. These were the sort of people who would be reluctant to undress to wash frequently, or who may not have had a spare set of clothes to allow for the washing of the set being worn. These clothes would thus provide a secure, warm and possibly long term home for lice. Luckin's theory is an attractive one, but is limited by the sequence of events which reduce the possibility that typhus was propagated by Irish migrants. Hardy uses the 1862 London typhus outbreak to show that there was no prior epidemic in Ireland - mortality there did not increase till 1863. Of the 992 typhus patients admitted to the London Fever Hospital in the first half of 1862 only 44 were Irish, and 39 of these had been in London for more than three months.<sup>60</sup>

Hardy's alternative explanation is that typhus mortality increased in times of urban 'disruption', particularly that caused by the construction of railways and other major building projects which resulted in widespread movements and relocations of the population. By correlating increases in typhus in the 1860's with the 'stress' overcrowding of suddenly prosperous districts like Poplar, Whitechapel, Greenock and St. Olave where there was a high level of employment, the explanation of urban social dislocation becomes plausible. This is substantiated by the information on typhus rates available for Liverpool and Glasgow, which is also used by Hardy. In Glasgow in the 1870's large scale clearance programmes for the old core of the city removed much of the poorest housing stock to make room for the railways, especially in the Bridgegate and Saltmarket areas. Although the railways were the beneficiaries of this clearance, much of it had been initiated under the 1862 City Improvement Act.<sup>61</sup>

Liverpool was recognised as providing 'a habitation and a name for the disease' during the nineteenth century,<sup>62</sup> and the association with the Irish in the city was well articulated in the press and in the medical statistics, which showed the highest rates of typhus in districts favoured by the Irish population. The 1847 typhus epidemic in Liverpool claimed 5,845 lives and was stimulated by the arrival in the town of over 300,000 Irish migrants who were fleeing the Great Famine. The stress which this imposed on the Parochial and charitable institutions in Liverpool was overwhelming, and it presented Duncan (who had been appointed as Medical Officer of Health in January 1847) with an immediate mortality crisis. During 1847 Duncan estimated that over 60,000 people in Liverpool had suffered from fever and nearly 40,000 from

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<sup>60</sup> A. Hardy *op.cit.*, p.414

<sup>61</sup> A.K. Chalmers, *op.cit.*, p.62

<sup>62</sup> *Lancet*, 1896, ii: p.548

diarrhoea and dysentery. As Frazer succinctly notes 'it was the most fatal year in the history of Liverpool'.<sup>63</sup>

Hardy's analysis however refers to the typhus epidemic in Liverpool between 1862 and 1867 which was systematically reported and analysed. In 1864 Trench, the MOH commented on the connection between the spread of typhus and indigence.<sup>64</sup> His investigations revealed that the Central Relief Society had given nearly double the usual amount of relief during the period June to December 1864, and that the winter soup kitchens had been opened early. In December 1864 the Parochial Board had also been forced to cut the amount of out-door relief it disbursed, leading Trench to comment on the increased number of typhus deaths which occurred after this action.<sup>65</sup>

The above facts form to my mind a chain of evidence consecutive and conclusive to prove that typhus has been epidemic in Liverpool not only with the pauper class, but with a class of persons above that of paupers, and that among them indigence preceded fever, so as to point to it as a principal cause of its epidemic prevalence.<sup>66</sup>

Hardy however, does not find evidence in Liverpool at this time of unusually high economic distress,<sup>67</sup> but notes that the typhus epidemic did coincide with the extension of railway construction into the heart of the old residential quarters of the city.<sup>68</sup> Typhus continued to exist in Liverpool in the residuum of the old housing stock, and there were occasional outbreaks into the 1890's.

As for diarrhoea, it has been possible using the data from the Medical Officer of Health's reports <sup>69</sup> to construct graphs to show the intra-urban patterns of typhus mortality. The districts with the highest rates, particularly during the 1860's epidemics were Howard Street, Dale Street and St Thomas (the same districts which showed the highest diarrhoeal mortality rates). The lowest typhus rates were to be found in the districts of Mount Pleasant, St George and West Derby. This pattern conforms with Hardy's hypothesis of urban 'disruption' or 'stress' up to a point. The districts hardest hit by typhus in the 1860's were the inner city ones, with a high proportion of 'made down' housing stock and severe overcrowding. This can be shown by calculating the district population density per acre and average number of persons per house for the census years.

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<sup>63</sup> W.M. Frazer, *Duncan of Liverpool* (London: Hamish Hamilton, 1947) p.59

<sup>64</sup> W. Trench, *Report on Indigence as a Cause of the Epidemic Typhus* (Liverpool, 1865)

<sup>65</sup> *ibid.*, p.5

<sup>66</sup> *ibid.*, p.6

<sup>67</sup> A. Hardy, *op.cit.*, p.421

<sup>68</sup> J.R. Kellet, *The impact of railways on Victorian cities* (London: Routledge and Kegan Paul, 1969) p.201

<sup>69</sup> These give annual disease-specific mortality for Liverpool districts, whereas the Registrar General's reports only present district rates on a decennial basis.

Figure 3.15 Typhus mortality - Liverpool 'good' districts  
1864-1901

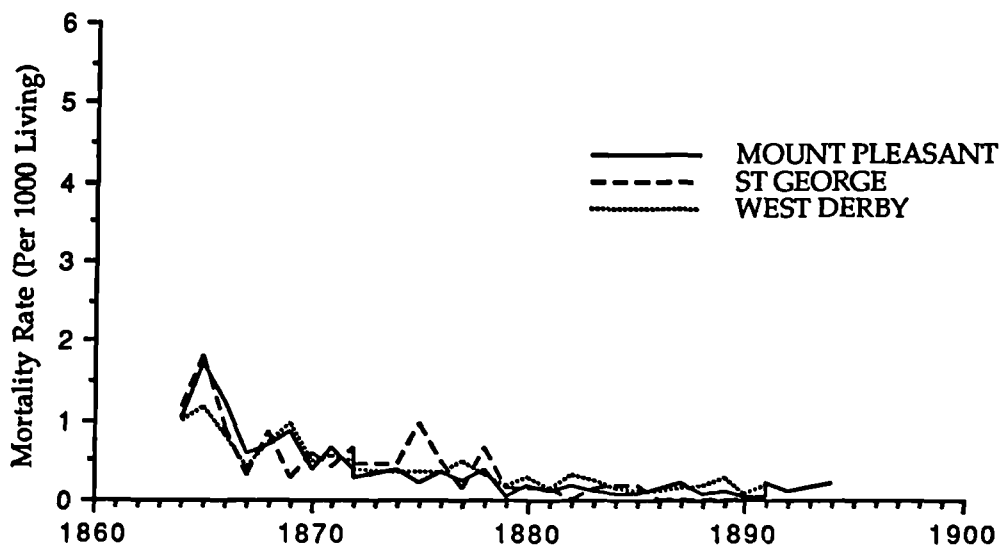
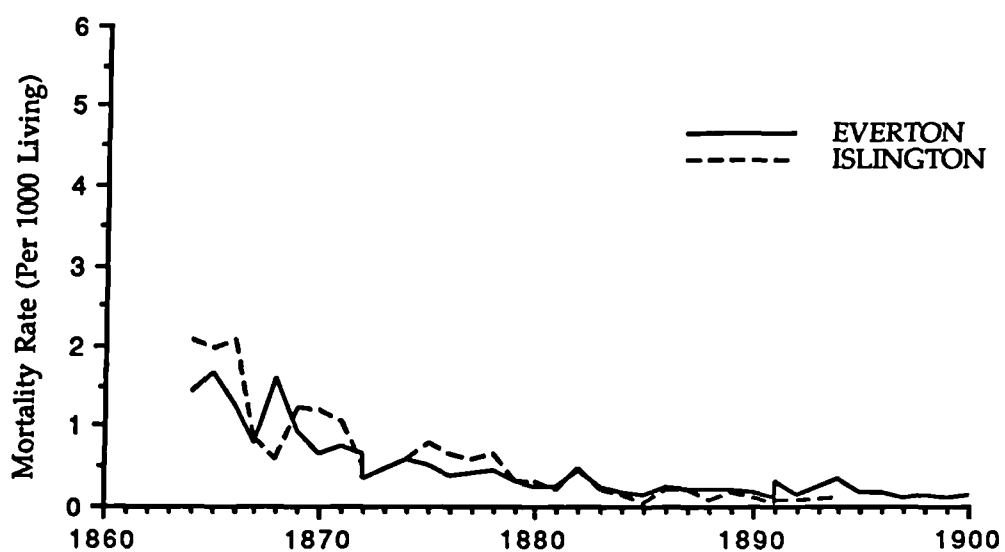
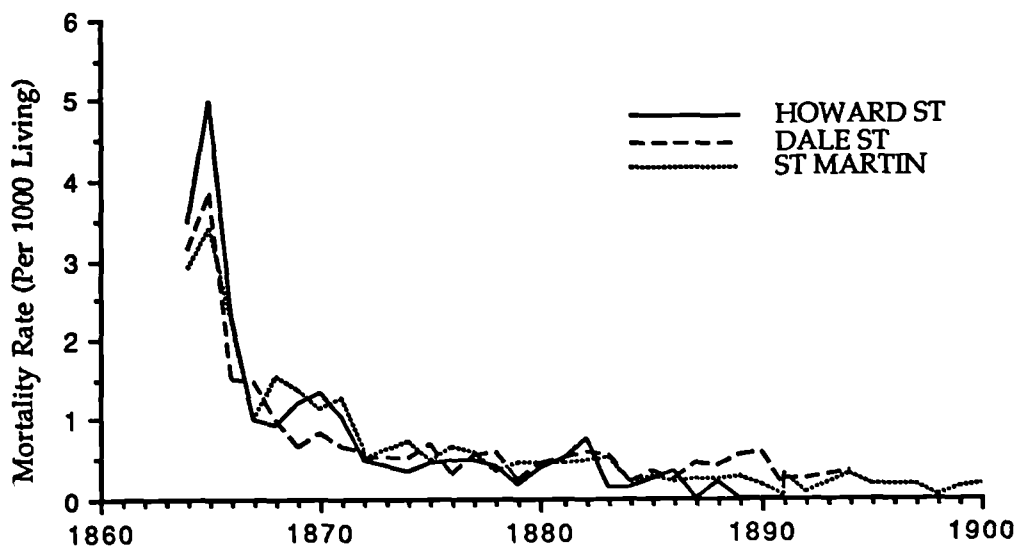
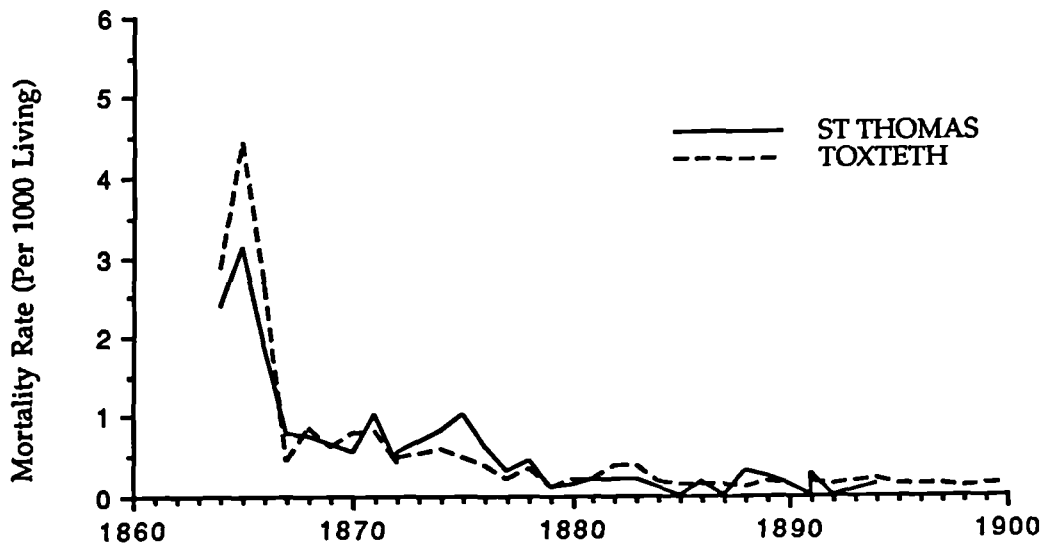


Figure 3.16 Typhus mortality - Liverpool 'bad' districts  
1864-1901



Data for a selected number of districts is presented below. What is interesting however, is that the correlation is not universal. From the population and housing density data one would predict that Islington would be a prime candidate for the typhus epidemic. In 1861 Islington had the highest population density rates in Liverpool at 194.53 persons per acre, considerably higher than Howard Street with 113.31. Yet Islington's typhus mortality is only 2.2 per thousand at its peak, which is less than half that of Howard Street at 5.1 per thousand. The explanation perhaps lies in the type rather than the density of housing. Howard Street had the largest proportion of court and cellar dwellings in Liverpool, which were served by water standpipes and rarely had sewers. Islington on the other hand, was sewered in the 1840's and had better water supplies to a better quality housing stock. Its location within Liverpool was also better than Howard Street, being located on a steep slope (natural drainage and good ventilation) and close to the commercial centre. The data would seem to suggest that overcrowding *per se* is not the determining factor. Rather it is type of housing and the general condition and habits of the inhabitants that predisposes an urban district to epidemic typhus. This point is emphasised by the examples of Mount Pleasant and St George districts. Both can be classed as 'good' in terms of their typhus mortality, yet Mount Pleasant has a relatively high population density.

All the Liverpool districts experienced reductions in their population densities towards the end of the nineteenth century, as the older insanitary housing stock was cleared and the residents moved out to new suburbs like Everton and West Derby. The typhus graphs show that, with the exception of a few minor mortality peaks in the 1870's, the intra-urban differences had almost been eliminated by the 1880's.

Table 3.2 Mount Pleasant Population and Housing Density

	Population	Houses	Pop/House	Pop/Acre
1841	33042	5109	6.47	85.37
1851	41997	6239	6.73	108.51
1861	47410	6901	6.87	122.50
1871	45582	6712	6.79	117.78
1881	41990	6215	6.76	108.50
1891	36089	5257	6.86	93.25

Table 3.3 St. George Population and Housing Density

	Population	Houses	Pop/House	Pop/Acre
1841	19723	2521	7.82	82.52
1851	19823	2513	7.89	82.94
1861	16827	2031	8.29	70.40
1871	9425	1270	7.42	39.43
1881	6642	936	7.10	27.79
1891	4924	764	6.44	20.60

Table 3.4 Islington Population and Housing Density

	Population	Houses	Pop/House	Pop/Acre
1841	37730	6255	6.03	177.97
1851	40977	6245	6.56	193.28
1861	41241	6272	6.58	194.53
1871	40231	6090	6.61	189.76
1881	36683	5591	6.56	173.03
1891	27641	4605	6.00	130.38

Table 3.5 Howard Street Population and Housing Density

	Population	Houses	Pop/House	Pop/Acre
1841	26197	3438	7.62	119.62
1851	27942	3344	8.36	127.58
1861	24816	3226	7.69	113.31
1871	18958	2832	6.69	86.56
1881	15380	2639	5.83	70.22
1891	7166	1316	5.45	32.72

The 1847 typhus epidemic in Glasgow killed 4,346 and the Irish immigration to the city in the wake of the Great Famine raised the disease for endemic to epidemic proportions. However, as in Liverpool, the typhus epidemic in Glasgow from 1861 to 1870 preceded the Irish epidemic, and we have to look for other explanations than 'Irish Migration'. Glasgow's typhus 1860's crisis provoked the establishment to provide more adequate hospital accommodation in the city. The 1862 Police Act arranged for additional beds for those patients who could not be taken into the Royal



Infirmery. The Parliamentary Road hospital opened in 1865 as a temporary fever hospital, but was subsequently maintained by the corporation after 1866. The 1862 Police Act had also made some progress towards solving the underlying cause of the typhus fever, rather than treating the results. The Act stipulated the minimum air space which was permissible within houses, and a ticketing system for lodging houses ensured that some of the worst cases of overcrowding were removed. By the end of the century occurrences of typhus were sparse enough to make possible detailed investigation. In a special enquiry of 1913 one of the primary causes was found to be the trade in second hand clothes. Rag dealers and their families were subject to visits from corporation inspectors, and verminous stock was burnt. Attention was also given to disinfecting the public transport system of Glasgow during this period as a way of removing the lingering cases of typhus. Thus attention had shifted from the domestic environment in the mid-nineteenth century to a truly 'public' health campaign.

The classification of diseases which was used for the Irish Registrar-General's Annual Reports makes it impossible to dis-aggregate typhus from typhoid in Belfast before the 1881-90 decade, but retrospective evidence from the reports into the city's high death rate which were conducted in the late nineteenth century suggest that the disease had always been a problem in the city, although attempts had been made to remove pockets of infection through a cleansing programme. The 1847 epidemic was particularly severe, and associated with the Great Famine, which increased the population in Belfast by over ten thousand rural refugees. It is with some irony however, that one can note that Liverpool, which stigmatised the Irish for their association with typhus was actually the initial source of the 1847 typhus epidemic in Belfast. Contemporary accounts attribute it to the arrival of *The Swatara* from Liverpool. Many of the passengers on board had been taken ill and they were taken to the Belfast General Hospital. Shortly after this, typhus appeared in the native population. Estimates were made by Dr Reid, who was in charge of the new Union Fever Hospital, that of the 13,649 cases of fever approximately 1,758 died.<sup>70</sup> A public meeting had been held in Belfast in May 1847 to petition Dublin for a Board of Health, similar to that which had been created in Newry during the 1820's typhus epidemic. This proved to be of some use in co-ordinating the efforts of the Corporation and the Parish Vestry, which had already appointed six Officers of Health (including Malcolm).<sup>71</sup> Thus the typhus epidemic in Belfast was catered for by four hospitals and a plethora of sanitary measures to deal with the great influx of destitute people who were entering the town. However, as with other epidemics, when the mortality peak was passed in July 1847 a degree of complacency set in and many of the precautions

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<sup>70</sup> J.S. Reid, *Dublin Quarterly Journal of Medical Science*, VIII no.16 n.s. 1848

<sup>71</sup> A.G. Malcolm, *History of the Belfast General Hospital* (Belfast, 1851) p.130

were relaxed. The Board of Health was dissolved in November 1847, at a time when the average number of weekly hospital admissions was still 151, and the epidemic was not completely over until the end of 1848 - nearly a year later.<sup>72</sup>

Typhus in Belfast presented Malcolm with another opportunity to substantiate his theories on the importance of sanitary measures. As with cholera, he was able to predict with considerable accuracy which districts of Belfast would provide the most typhus casualties. He published three important articles during 1847 in the *Belfast People's Magazine*, which was produced by the Belfast Working Classes Association for General Improvement.<sup>73</sup> The first article was entitled 'Sanitary Inspections of Belfast' and presented a map of an area of Belfast (between North Queen Street and the Antrim Road) which was notorious for its back-to-back houses and open sewers. The second and third articles addressed the threat of typhus more directly, and drew on the work of Chadwick and other English sanitary reformers for supporting evidence that overcrowding was a prime factor in the spread of typhus. Malcolm recognised that the physical condition of the new arrivals in the town, coupled with the condition of the districts in which poverty forced them in lodge, swelled the typhus mortality rate above its endemic levels

we well remember the aspect of the hordes of poor who thronged into the town from all parts. Famine was depicted in the look, in the hue, in the voice and the gait. The food of a nation had been cut off; the physical strength of a whole people was reduced; and this condition, highly favourable to the impression of the plague-breath, resulted in the most terrible epidemic that this Island has ever experienced.<sup>74</sup>

Malcolm used this epidemic and the others which he had experienced in Belfast to stress most strongly in 1852 the need for sanitary reform. He presented his conclusions in his paper given at the British Association meeting which was held in Belfast in 1852 that

the tendency to epidemic visitations and outbreaks is on the increase in this town, *and that such are becoming more fatal.*<sup>75</sup>

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<sup>72</sup> H.G. Calwell, *op.cit.*, p.95

<sup>73</sup> This was formed in early 1847 to continue the work of the Belfast Society for the Amelioration of the Condition of the Working Classes, which it was felt did not reach a large enough working class audience. This new association was therefore actually managed by working class representatives, and it opened a reading room in Castle Place in June 1847 to aid the dissemination of 'constructive' information such as that provided by Malcolm in the magazine (vol1, no.7, 1847, p.156; vol 1, no.12, 1847, p.282).

<sup>74</sup> A.G. Malcolm, *History of the general hospital* (Belfast,1851), p.131

<sup>75</sup> A.G. Malcolm, *The sanitary state of Belfast with suggestions for its improvement* (Belfast,1852) p.14

Figure 3.14 has been presented as a summary to show the combined fever mortality. The typhus epidemics of the 1860's appear clearly in all three cities, along with Belfast's typhoid of the 1890's. The sustained improvement which both Liverpool and Glasgow exhibit from the 1880's suggests that some ameliorating factor was operating - possibly the elimination of the old insanitary housing stock, and the reduction in overcrowding in the city centre districts.

### 3.9 Typhoid

Typhoid fever is not spread by body lice but is a bacterial infection like cholera, and is spread by contaminated food and drink. The typhoid bacillus was first identified in 1880 by Eberth. The symptoms of typhoid were similar to those of typhus - a fever, loss of appetite and sometimes a rash, but typhoid cases also suffered from diarrhoea which did not accompany typhus, and gave rise to the alternate name for the disease as 'enteric fever'.<sup>76</sup> Typhoid was a summer and autumn disease in contrast to the winter biased typhus, and its case fatality was generally lower at approximately 15-20%. Despite this, Luckin has estimated that typhoid accounted for the largest number of deaths in London between 1840 and 1910.<sup>77</sup> This is intensified by his analysis of the trends in mortality which re-evaluated the deaths from simple continued fever, and suggested that even though as a killer it was statistically unimportant, it should for the sake of accuracy be re-classified as typhoid.<sup>78</sup>

Typhoid in nineteenth century British towns and cities cannot be ignored. It is one of the most reliable indicators of water purity and general levels of sanitation. The epidemiological history of the disease in Liverpool, Belfast and Glasgow forms an important part of this thesis. It provides a justification or a condemnation of the massive amount of capital which was invested in water and sewerage systems for the precise purpose of removing this urban plague. The national trends, after they can be separated from typhus show a persistence of the disease through the final decades of the century, despite widespread campaigns to improve sewerage and water systems.

Throughout the century there persisted a number of ideas on how typhoid was transmitted. Variations on the miasmatic theory lingered, based on the theory of vapours from privies and water closets.<sup>79</sup> Luckin has also shown that improvements in the filtration of polluted water, especially from the London water companies wiped out much of the typhoid mortality, and that when that improvement had been made, other causes for the residue typhoid mortality were searched for. Thus in the 1870's and

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<sup>76</sup> B. Luckin, *op.cit.* p.106. Enteric means relating to the intestines.

<sup>77</sup> B. Luckin, *Pollution and Control: a social history of the Thames in the nineteenth century* (Bristol: Adam Hilger, 1986) p.118

<sup>78</sup> *Ibid.*, p.106

<sup>79</sup> B. Luckin, 'typhus and typhoid in London', *op.cit.*, p.116

1880's contaminated milk and shellfish were often found to be the source of infection, following sanitary detective work by local Medical Officers of Health, and hints from epidemiologists.<sup>80</sup> However, the link between typhoid and water supply remained firmly entrenched in the minds of the nineteenth century urban resident, and isolated outbreaks of typhoid were often assumed to emanate from the waterworks, even when the source of water was distant and beyond the possibilities of contamination by sewage. This will be apparent from the experience in late nineteenth century Belfast discussed below.

Liverpool's typhoid mortality is surprisingly low, given the ideal conditions which the city offered. Although it does not feature as an epidemic disease, it is a persistent presence in the annual mortality tables, still averaging over 100 deaths per annum into the 1880's. When this disease is considered in relation to the timing of the extension of the Liverpool waterworks, which is discussed in chapter four, it is clear that it intensifies at times of water shortages in the city. Hope noted in 1889 that unlike the other 'fevers', although typhoid started from a lower base rate, it had not declined to the same degree. He attributes this in part to the old theory of infection by sewer gases, suggesting that they could be reduced by the periodical flushing of sewers by water tanks.<sup>81</sup> The Rivington works were not supplying sufficient water to meet the needs of all of the population, as well as the demands of industry, and some of the old wells within the city had been forced to step up production, despite the fact that they had become increasingly polluted with sewage which had made its way into the underground watercourse through privies and cess-pits. The continuing use of these privies and Cess-pits is acknowledged in the 1866 Report and Evidence of the Mortality Sub-Committee of the corporation.<sup>82</sup> Water supply reverted to an intermittent system in Liverpool at this time, and households had once again to find all sorts of containers in which they could store water, possibly for days. Undoubtedly, as water became scarcer, some non-essential functions such as washing down the food preparation areas and personal hygiene must have suffered. It is interesting to note however, that typhoid was a disease which frightened the middle classes, because they extracted their water, and to a certain extent their milk from the same sources as the working classes. Thus, unlike typhus which had a distinct attachment to poverty and social distress, typhoid could strike anywhere within the city.

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<sup>80</sup> The epidemiological section of the Royal Statistical Society was particularly active in collecting and disseminating advice through its Journal.

<sup>81</sup> E.W. Hope, 'Some Features of the Local Incidence of Typhoid Fever', *Transactions of the Sanitary Institute of Great Britain*, vol.XI, 1889 p.398

<sup>82</sup> Mortality Sub-Committee, *Report and Evidence on the Causes of the Excessive Mortality of the Town* (Liverpool: George McCorquodale, 1866) p.viii.

The introduction of water from Loch Katrine in 1858 effectively removed water supply as an explanation for typhoid cases. The outbreaks in 1873, 1875, 1877-78, 1880 and 1884 could all be traced to specific milk supplies where there the milkmen had the disease, or there were problems with water or drainage at the place of production.<sup>83</sup> The lag in the introduction of a sewerage system, combined with the choice of pail closets over water closets probably inflated typhoid rates in the city to a higher level than if Glasgow had introduced all the components of the sanitary system. An enquiry in 1902 investigated over 1,300 cases of typhoid which had occurred in the Eastern districts of the city during the period 1897-1901. These were areas which were associated with lower socio-economic groups and a poorer housing stock of tenements. 8% of the cases were in the same tenements year after year. The case rate per tenement with water closets was 1.2%, and that for tenements with wet middens was 2.6%.<sup>84</sup>

The abnormally high typhoid mortality figure for Belfast for the last decade was due to an epidemic caused by eating contaminated shellfish caught in the Belfast Lough, which incidentally was the outflow site for the Belfast sewerage system. The increase in the mortality rate prompted a full-scale inquiry into the source of the contamination, and a succinct summary of the situation would be that the water system was guilty until proven innocent. The Local Government Board for Ireland appointed a Commission in 1907 to investigate the sanitary system of Belfast. Members of the Commission included a member of the Royal Commission on Sewage Disposal, the Medical Officer of Health for Glasgow (Dr A.K. Chalmers), the Chief Engineering Inspector and the Medical Inspector for the Local Government Board for Ireland, and Dr L.W. D. Mair, who subsequently wrote up the history of the outbreak as well as the methods of the Commission for publication in the *Journal of the Royal Statistical Society*.<sup>85</sup> When the Commission began to take evidence, two accusations were made. The Water Commissioners blamed the persistence of typhoid on the insanitary conditions in Belfast, while the Corporation of Belfast, who were anxious to escape this condemnation of their competence in sanitary administration, alleged that the source of the fever was the pollution of the water supply. Using data beginning in 1897, 'spot maps' were compiled to show the location of outbreaks, and which of the two water sources they were served by.<sup>86</sup> However, evidence from Frankland suggested that the long storage times in reservoirs at both sites (between 6 and 10 months) would kill off any *bacilli coli*. The maps of outbreaks showed that they were evenly divided between

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<sup>83</sup> A.K. Chalmers, *op.cit.*, p.303

<sup>84</sup> A.K. Chalmers, *op.cit.*, p.304

<sup>85</sup> L.W. Darra Mair, 'The Aetiology of Enteric Fever in Belfast in Relation to water Supply, Sanitary Circumstances and Shellfish', *Epidemiological Section of the Journal of the Royal Statistical Society*, 1909, pp.187-242

<sup>86</sup> Belfast drew water from Woodburn, 12 miles north of the city and from Stoneyford, 15 miles to the west.

areas supplied by the two water sources, but that there was a correlation with the poorest parts of the city. However, the intensity of the outbreaks, and the way in which they affected recently built working class housing, as well as the remaining insanitary areas suggested that the other allegation of a failure of sanitary administration was also faulty. Eventually, it was decided to test the shellfish which were taken from the Belfast Lough, and which formed a substantial part of the average working class diet. This was found to be the source of the infection, as the shellfish were taken from an area in which Belfast's sewage was discharged. So, indirectly the Corporation of Belfast did turn out to be the guilty party. They had been informed of the risk of contaminated shellfish in the 1890's but had chosen not to prosecute street traders for selling food unfit for consumption, and they had refused to consider changing the discharge site for the new sewerage system.

The moral of the Belfast shellfish story would seem to be that attention needs to be paid to all aspects of local government sanitary work during this period, and that the persistence of traditional theories on the spread of disease often take massive pieces of epidemiological investigation to overturn. This has direct implications for the way in which we assess the 'classic sanitary revolution' and should serve as a caution against quick acceptance of national explanations.

The detailed evidence supplied by Luckin on typhus and typhoid in London in the last 20 years of the nineteenth century suggests that the decline in mortality was due to the impact of hospitalisation and early identification of the diseases. To summarise the reasons for the decline in the diseases, it would seem that typhoid was brought under control through the efforts of doctors and public health workers, the introduction of bacteriological laboratories, and the purification of the water supply. Typhus responded to a reduction in the body louse population which was achieved through raising the levels of domestic hygiene and the introduction of efficient sewage and refuse removal systems.

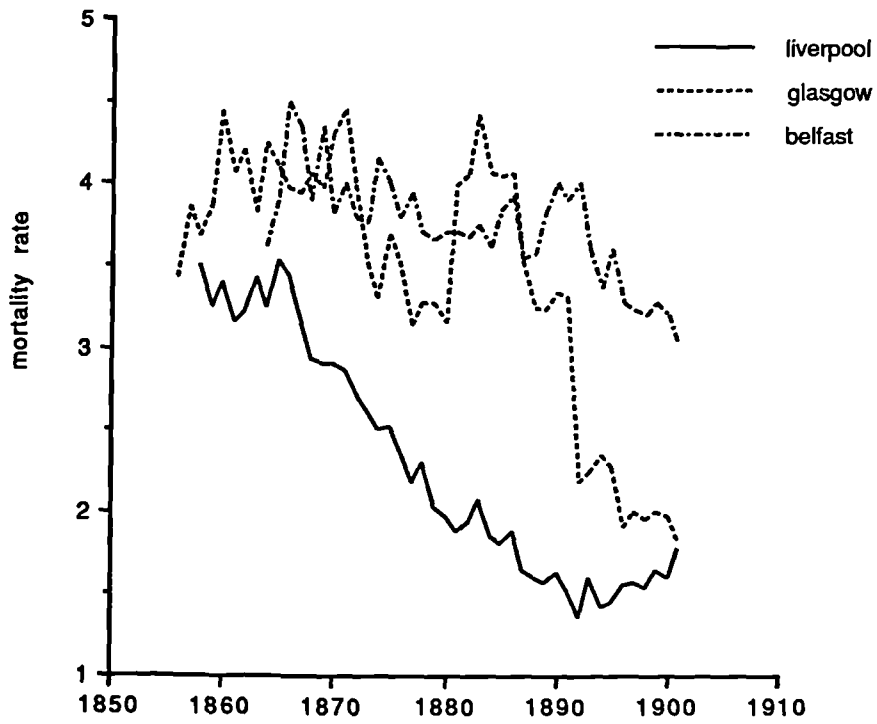
### 3.10 Respiratory Tuberculosis

Phthisis is the more common name used in the nineteenth century for what we now call respiratory or pulmonary tuberculosis. It was one of the major killers of the period, and McKeown claims that it accounted for 17.5% of the reduction of airborne diseases, with half of this occurring before 1901.<sup>87</sup> Tuberculosis affected many parts of the body - phthisis worked on the lungs while that type found in the digestive tract, bones, joints and lymph nodes was known as scrofula. Extra-pulmonary tuberculosis affected mainly infants and young children. Phthisis was an adult disease and in the

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<sup>87</sup> T. McKeown, *op.cit.* (1976) p.153

Figure 3.17 Phthisis mortality rates - Liverpool, Belfast and Glasgow 1851-1901



nineteenth century killed more young adults than any other disease.<sup>88</sup> It had a number of synonyms - the white plague, 'the captain of the men of death' and consumption.

The rationale for including a discussion of respiratory tuberculosis in this study is that it was a good indicator of overcrowded urban conditions, even in the eighteenth century, and as such provided a 'sensitive index of living conditions in a community'.<sup>89</sup> It was only after the identification of the tubercle bacillus in 1882 by Koch that the authorities finally adopted the germ theory of the spread of the disease and instigated specific measures to reduce the transmission of the disease - by setting up strict controls on milk purity and prohibiting spitting in public places.<sup>90</sup> The bacilli are spread through infected people coughing or spitting (the droplet method of infection) or by food contaminated in this way. Being close in close proximity to a carrier will therefore to increase the probability of contagion - this explains why overcrowding is so closely correlated with the level of tuberculosis mortality. Where the source of infection is the milk supply, domestic hygiene becomes of vital importance. Even if the authorities can control the quality of the milk entering the city, they cannot ensure that it is stored in clean conditions in the home. Likewise, it is of no benefit maintaining a clean home if the milk is taken from a contaminated churn in the shop. The bacillus can be killed by boiling, but the cost of a stove was probably beyond the pocket of the majority of the poor who were likely to receive milk from infected shops.

McKeown's analysis of tuberculosis mortality, as with other diseases rests on the role of improved nutrition. Tuberculosis is not fatal - the bacillus in the time before streptomycin (introduced in 1947) could be killed by calcification of the infected area. The seriousness of the infection was related to the health of the patient and his/her standard of living. People who successfully came through an infection of tuberculosis had some immunisation against future infections. It is clear though, that some of the decline in tuberculosis mortality was also due to medical factors, in particular the establishment of isolation hospitals. For most of the nineteenth century, the medical response was to 'strengthen the whole constitution against an inherited or acquired susceptibility to the disease.'<sup>91</sup>

When tuberculosis is divided into its constituent parts, the decline of phthisis is more pronounced than that of the non-pulmonary diseases. Cronje estimated that phthisis accounted for 60-80% of all tubercular deaths and that the average mortality

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<sup>88</sup> G. Cronje, 'Tuberculosis and Mortality Decline in England and Wales 1851-1910' in R.I. Woods and J. Woodward (eds.) *op.cit.* , p.79

<sup>89</sup> G. Rosen, 'Disease, Debility and Death' in H.J.Dyos and M. Wolf (eds.) *The Victorian City* (London: Routledge, 1973) p.648

<sup>90</sup> A.S. Wohl, *Endangered Lives* (London: Dent, 1982) p.131

<sup>91</sup> G. Cronje, *op.cit.* p.83



rate for males per 1000 fell from 2.7 in 1851-60 to 1.6 in 1891-1900. For females the comparable figures are 2.9 to 1.2 per 1000.<sup>92</sup> How do Liverpool, Belfast and Glasgow fit into this pattern? Using figure 3.17, all three cities show a long term decline in annual phthisis mortality. Liverpool's pattern is relatively uncomplicated, and the rate stabilises at 1.6 per 1000 in the late 1880s. Glasgow also finishes at this level but the journey to it is interrupted by a major increase in mortality in the 1880s. Belfast exhibits a smaller decline and the average mortality by the end of the century is 3.2 per 1000 - double that for Liverpool and Glasgow. Kearns has stressed that mis-diagnosis of tuberculosis - with phthisis deaths being included in the respiratory diseases category may have obscured the real trend, and that the decline in phthisis may not be as large as that suggested by McKeown and Cronje.<sup>93</sup>

Employment conditions have been identified as a possible cause of high respiratory tuberculosis mortality. This would certainly seem to fit the Belfast experience. The high percentage of the Belfast work force who worked in the linen mills were more susceptible to chest infections, whereas Liverpool and Glasgow did not have such high concentrations of workers in these environments likely to promote respiratory diseases. The 'employment' explanation for Belfast is also substantiated by the work of Froggat, who uses contemporary reports on morbidity and mortality.<sup>94</sup> Although these relate mainly to the early part of the century, Dr Malcolm found that in 1856 of the 2078 women flax operatives he examined, that 12.2.% of the 'preparers' of the flax had diseases of the chest. Conditions in other parts of the textile mills, such as the wet spinning rooms were bad for health, with the air constantly humid and the clothing of the operatives soaked with spray from the machines.<sup>95</sup>

### 3.11 The nutrition argument

McKeown's stress on nutrition is based on the idea that an undernourished individual will present less resistance to an infection, and he couples this with the assertion that with increasing urbanisation in the nineteenth century, the exposure to infectious diseases would have increased.<sup>96</sup> This is no doubt true, given the overcrowding which was commonplace in the working class sectors of towns and the new trend for large scale places of employment, which would mix a great number of people. It is possible to test the hypothesis that nutrition affects disease resistance

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<sup>92</sup> F.B. Smith, *The Peoples Health* (London: Croom Helm, 1979) p.213

<sup>93</sup> G. Kearns, *op.cit.* (1988) p.229

<sup>94</sup> P. Froggat, 'Industrialisation and Health in Belfast in the Early Nineteenth Century', in D. Harkness and M. O'Dowd (eds.) *The Town in Ireland* (Belfast, Appletree Press, 1981) pp.155-185

<sup>95</sup> A.G. Malcolm, 'The influence of factory life on the health of the operative, as founded upon the medical statistics of this class at Belfast', *Royal Statistical Society Journal*, xix no.2 (June 1856) pp.170-181

<sup>96</sup> T. McKeown and R.G. Record, *op.cit.* (1962)

today, but for the nineteenth century we are left with the 'back door' approach such as that used by Oddy<sup>97</sup> who shows that there was no appreciable difference in the weight or height of working class schoolchildren, or any change in working class diets from the traditional carbohydrate standard.

Recent research by Lunn and Scrimshaw which uses twentieth century analysis shows the synergistic interaction between malnutrition and infection.<sup>98</sup> Lunn finds that many infections in children are accompanied by a decrease in the appetite, and that what food is taken is not easily absorbed by the body. The resulting malnutrition leaves the patient more at risk from infections, and infections in malnourished patients have been found to last longer and be more severe. Lunn thus concludes that nutrition, infection and immunity are closely interrelated and that changes in one component will cause alterations in the other two.<sup>99</sup> To understand the effects of diseases on the average nineteenth century urban resident therefore, we require information on what the average nutritional intake was. Burnett provides detail on the daily diet during this period, in particular on how the family meals were organised, and access to hot food.<sup>100</sup>

McKeown goes into great detail to show the agricultural improvements which allowed for a dramatic increase in production in the nineteenth century. The widespread use of 'enclosure', the introduction of the potato to Europe and the change from 'exploitative to productive agriculture' all allowed for an increase in population from 5.5 million in 1702 to 17.9 million in 1851, without recourse to importing substantial amounts of food. However, the increase in the consumption of protein in the form of meat and dairy produce was slow and limited to the wealthier classes, or to the male adults in the household. Nutritional improvements may not be immediately obvious therefore in a national decrease in mortality.

An alternative suggestion is made by Woodward that better nutrition reduced morbidity and in fact promoted a healthier individual than those who had been afflicted by disease.<sup>101</sup> This would have had an effect on the mortality not just from McKeown's diet related diseases but also on mortality from hitherto unconnected diseases, such as those with aetiologies suggesting that they would only respond to improvements in sanitation. The other aspect of nutrition which must be considered apart from that of average diet and the amount of food intake is the question of the

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<sup>97</sup> D. J. Oddy, 'The Health of the People' in T. Barker, and M. Drake, (eds.) *Population and Society in Britain 1850-1980* (London: Batsford, 1982) p.123

<sup>98</sup> P.G. Lunn, 'Nutrition, Immunity and Infection' in R. Schofield, D. Reher and A. Bideau, (eds.) *The Decline of Mortality in Europe* (Oxford, Clarendon Press, 1991) pp.131-145. N.S. Scrimshaw, 'Significance of the Interactions of Nutrition and Infection in Children', in R.M. Suskind (ed.) *Textbook of Pediatric Nutrition* (New York, 1981)

<sup>99</sup> P.G. Lunn *op.cit.*, p.145

<sup>100</sup> J. Burnett, *Plenty and Want: A social history of diet from 1815 to the present day* (London, 1989)

<sup>101</sup> J. Woodward, in R.I. Woods and J. Woodward, (eds) *op.cit.* p.68

quality of the food. Legislation setting minimum standards for food hygiene were only introduced in the 1860s and 1870s. Wohl reminds us that the working classes had limited access to stoves and so resorted to buying their hot food out. There was a lack of cooking utensils - in some cases the single cooking pot would have to be cleaned out of the baby's bath water (or worse !) before cooking could begin.<sup>102</sup> The standard of food was inadequate for the poor, whether rural or urban, but the items on the urban menu sounded more unappetising - slink (prematurely born calves) and broxy (diseased sheep) in comparison to the sparrow soup and sparrow dumplings on their rural counterparts' dinner plates.<sup>103</sup> Alum was added to bread, venetian lead to sugar confectionery and beverages, and water and chalk to milk. By 1872 only 7 analysts had been appointed under the adoptive 1860 Food and Drugs Act. The 1875 Food and Drugs Act defined pure food, but for most of the nineteenth century there was no standardisation of fines for offenders. It was not until 1912 that street vendors had to be licensed to sell food, and that any checks were imposed on them.<sup>104</sup>

The effects of nutrition on general health were however, to some extent shown by Rowntree in his study of York. He found that the difference between the better working class boys and those from poorer families was quantified in terms of 3.5 inches in height and an extra 11.25 lbs in weight.<sup>105</sup> How we can translate this tenuous correlation into an explanation for the declining mortality levels of the nineteenth century is not clear.

### 3.12 Conclusion

All three cities show a similar pattern for total mortality decline (Figure 3.1 Crude mortality rates). Liverpool's data series extends back to 1838 and encompasses the mortality crises of the 1840s, which in part prompted the sanitary reforms starting with the Liverpool Sanitary Act of 1846, and includes the introduction of large-scale waterworks and the development of new solutions to the problem of excrement and refuse removal. The mortality peak of 1865-66 is evident in both Liverpool and Glasgow (data not available for Belfast) but it is not so severe for Glasgow.

Age specific mortality rates for Liverpool, Belfast and Glasgow also go beyond McKeown's analysis, and show that although the total mortality rate declined during the century, the rates for some age groups (over 45s) actually increased, indicating that the causes of death which were specific to this section of the population were not responding to recent changes in the urban environment. When individual diseases are

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102 A.S. Wohl, *op.cit.* p.48

103 *Ibid.*, p.50

104 F.B. Smith, *op.cit.*, p.213

105 A.S. Wohl, *op.cit.*, p.57

considered, all three cities show similar patterns for Fevers, and Diarrhoeal diseases.<sup>106</sup>

Through the analysis of diseases commonly associated with sanitation and urban conditions (diarrhoea, cholera, typhus, typhoid and respiratory tuberculosis) several patterns emerge which are common to all three cities. Firstly, there existed in Liverpool Belfast and Glasgow a number of enlightened individuals (usually medically trained) who embark on their respective 'sanitary crusades' during the 1830's and 1840's. Their relevance to this chapter is that they all attempted pioneering work in the collection and analysis of disease statistics. Whether they maintained or developed this 'public health' role will be discussed in more detail in chapter seven. However, their interpretation of the cause and spread of diseases influenced the decisions which were subsequently taken by urban authorities on the design and installation of sanitary systems. Secondly, the disease-specific sections above indicate that in all three cities typhus, typhoid and diarrhoea were used to the same extent as cholera by the contemporary authorities to press for sanitary reform, and that these diseases are just as useful as cholera in evaluating the effectiveness of sanitary measures. In particular, the changing opinions on the mode of transmission of typhoid were used in Belfast to test the weakness of the Corporation's health department, as much as an exercise in epidemiology.

The successful eradication of cholera as a primary epidemic disease, and the sustained improvement in the mortality rates for typhus and typhoid suggest that the policies, particularly those based on water and sewerage systems, were having an impact in the nineteenth century urban environment. The observation made by Malcolm in Belfast in 1852 that the epidemics were becoming more frequent and more intense seems to come to a prophetic finale in the form of the typhus epidemics which struck in all three cities in the 1860's. However, the 'dirty' diseases after this period do appear to be in decline, or rather when outbreaks do occur, it is usually possible to attribute them to some precise factor such as infected milk and shellfish supplies. The persistence of diarrhoea as a major killer of infants, and its increase in the 1890's, suggests that the disease did not respond to the same mix of sanitary measures as the other 'dirty' diseases, or that the measures were not penetrating into the domestic environment with the same degree of success that had been achieved in the public environment. A shift in public health ideology was required to tackle this entrenched mortality, and this came with the early twentieth century emphasis on hygiene information and programmes of intensified domestic inspection.

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<sup>106</sup> Fevers includes typhoid, typhus and simple fever. Diarrhoeal diseases includes diarrhoea, dysentery and cholera.

The discussion in this chapter would suggest that all three cities made efforts, but with varying degrees of success, to improve the sanitation of their urban environments. Chapter two highlighted the political problems experienced by Liverpool, Belfast and Glasgow. One of the main theories which it developed was that Belfast's financial constraints would severely hinder the adoption of costly water and sewerage systems. This problem would be aggravated by the ineffectual nature of the municipal corporation in Belfast as the official sanitary authority. Thus the following chapters on water and sewerage systems, and on baths and wash-houses should indicate firstly whether there were significant improvements which these reductions in mortality can be attributed to. Secondly, and possibly more importantly for this thesis, the chapters should illuminate how the mortality crises were specifically used to achieve the introduction of new sanitary systems. The decision making processes in the three cities balanced the perceived threat of epidemics, particularly cholera, with the financial and political ramifications of the projects.

## Chapter Four

### Water Supply

I can see little glory in an Empire which can rule the waves, but is unable to flush its own sewers.<sup>1</sup>

#### 4.1 A Review of Research on Supply Mechanisms

The position of this chapter within the thesis is important to the development of the central hypotheses. Water systems were the biggest investment that most towns and cities made during the nineteenth century, and as such they could be expected to arouse the most debate (about their merits as ways of reducing mortality, and improving commerce) and the most opposition (over the cost involved, and therefore the increase in the burden on the ratepayer, or increase in the total urban debt). This chapter links well with chapter two, where the economic strengths and weaknesses of the three cities were introduced. It is possible, in light of the information presented at that stage, to make some tentative judgements on what type of policy the individual cities could be expected to follow.

All three cities were wealthy, in terms of the size of their rateable population. It is difficult to obtain accurate figures, but contemporary evidence suggests that there was money available for projects in all three cities. However, Belfast was not really in the same league as the other two, having a smaller population in the first half of the nineteenth century and Liverpool lost one of its main revenue sources when the Dock Estate achieved independence from the corporation in 1857.<sup>2</sup> In terms of finance, it would be expected that Glasgow would find it less of a strain on the municipal purse to pay for a substantial water system. The impact of politics on the introduction of a water system could be varied. The level of political participation was highest in Liverpool, and lowest in Glasgow. Thus if the local political debates centred on local issues, water in Liverpool is a likely contender. The overt manipulation of the political system in Belfast by John Bates until the 1850s could also alter the timing of the introduction of a water system, given his desire to cap municipal expenditure.

The introduction of water systems can thus be used as a test of the strengths and weaknesses of existing local government structures, and provide an opportunity to see whether the motivation for installation was primarily financial (municipal trading) or social (improving the urban environment and reducing mortality levels). Other important issues in the nineteenth century supply of water relate to the purity of the

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<sup>1</sup> Winston Churchill

<sup>2</sup> B. White, *A History of the Corporation of Liverpool 1835-1914* (Liverpool: Liverpool University Press, 1951) p.75

sources used (both contemporary and modern definitions), the changing technology for water storage and the filtration question. All of these issues have a direct impact on the public health, and will be considered in section 4.1b.

As cities expanded in the nineteenth century most of them encountered problems with their supplies of water. The initial sources which had often sufficed for hundreds of years were now becoming inadequate for the needs of the new population as well as the industries. Liverpool, Glasgow and Belfast all had problems due to the limitations imposed by their geographical locations but they evolved with quite different solutions.

### *Municipal or Private?*

Several hypotheses have been recently developed to explain the fluctuations in the control of the water supply between the public and the private institutions. It was rare that a town would have a mixture of systems, usually it was maintained by the corporation for the benefit of all the inhabitants or it was a private company, authorised by Act of Parliament to sell water to those who could afford it, thus making it a commodity and effectively ignoring the universal necessity of supply. It was generally accepted in the nineteenth century that the municipality would provide the drainage system for a town, but there was not necessarily any link between the administration of water supply and that of drainage and sewerage systems. The three cities provide examples from across the range of nineteenth century water undertakings, which should allow for an evaluation of the work of Hassan.<sup>3</sup> In 1844, 26 of the 50 largest towns were supplied from an undertaking which had parliamentary authorisation.<sup>4</sup> The period from 1831 to 1851 saw a partial privatisation of the water industry. Between 1846 and 1865, 80 joint stock companies joined the 65 private waterworks already operating.<sup>5</sup> However, for many towns the experiment only lasted a short time. From the mid nineteenth century a trend towards the municipalisation of water supplies in urban areas can be identified. This accompanies the unification of other urban services which followed the Municipal Corporations Act of 1835. In 1841 the proportion of municipally supplied towns was 40.8%, by 1881 this figure had risen to 80.2%.<sup>6</sup> By

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<sup>3</sup> J. Hassan, 'The Growth and Impact of the British Water Industry in the Nineteenth Century', *Economic History Review*, 38 (1985); J. Hassan, 'The Impact of Public and Private Ownership and Investment in the Water Industry: the Experience of Manchester', *Manchester Polytechnic Discussion Papers* 14 (1982); J. Hassan, 'The Economic and Social Implications of Water Resource Development in Manchester 1568-1882', *Manchester Polytechnic Discussion Papers* 10 (1980)

<sup>4</sup> J. Hassan, *op.cit.*, (1985), p. 534

<sup>5</sup> W.M. Stern, 'Water Supply in Britain: the Development of a Public Service', *Royal Sanitary Institute Journal* LXXIV (1954) pp. 999

<sup>6</sup> J. Hassan, *op.cit.*, (1985), p. 535

1900 only 6 out of 29 towns in Great Britain with a population over 100,000 received their water supplies from private companies.<sup>7</sup>

Table 4.1 Number of Municipal Corporations Adopting Water Supplies 1790-1919

Period	No. Corporations
1790-1845	10
1846-1855	29
1856-1865	22
1866-1875	66
1876-1885	68
1886-1895	42
1896-1905	69
1906-1914	20

The majority of research on the economics of water supply in nineteenth century Britain has been carried out by Hassan. He has focused attention on the transition from private water companies to municipalised schemes, and through his work he has produced the following general hypothesis:

It is suggested that whereas municipal enterprises acted as sales-maximisers and adopted extended planning horizons, private enterprises typically pursued short run profit maximising goals.<sup>8</sup>

Hassan's model is based on the principles of net benefits, economies of scale and profit maximisation. His work on Manchester has offered a new approach in the debate on public versus private water supplies, but the detailed materials he has used from the Manchester archives are not generally available for other towns for the model to be properly tested, thus we must be content with a more subjective analysis of his basic hypotheses. Hassan suggests that the experiment with privatisation at the beginning of the nineteenth century arose from the inability of local government to raise the large amounts of capital needed to undertake water supply schemes, the need for which was increasing due to the rapid rate of urbanisation. The intervention of local authorities in the urban environment was only formalised through the 1848 Public Health Act. This permitted the take over of private water companies but only if the companies agreed to it. However, the process of forming a private company was equally difficult. The expense of private Bills was a deterrent and the system was not simplified until 1847 when the Waterworks Clauses Act offered a standard legislative format. Parliamentary permission was needed for water companies because of the way in which they trespassed on the rights of 'private property', requiring permission to carry aqueducts

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<sup>7</sup> *Joint Select Committee Report on Municipal Trading* PP 1900 VII Minutes of Evidence question 12.

<sup>8</sup> J. Hassan, *op.cit.* (1985), p. 532



and pipes across private land and also to legalise the relationship between the company and the customer.<sup>9</sup> Parliamentary interest in the private supply of water did not stop at passing the Acts. Stern estimated that 70 Members of Parliament in 1851 were concerned financially in private waterworks companies.<sup>10</sup>

The supposed 'failure' of private water by the 1840's can be seen indirectly through parliamentary action, firstly by identifying monopolistic tendencies in the companies which led to their characterisation as the villains in numerous reports, and secondly, by a succession of towns promoting Bills for municipal water supply. Hassan, using a more economic interpretation of the move to public control, suggests that private companies, who were using short run time scales and constrained by parliamentary price ceilings, were beginning to reach the profit limits in their markets. New projects involving costly equipment or parliamentary legislation would not produce the rapid returns expected by shareholders.<sup>11</sup>

Attention must also be given to the overall investment trends at this time within the British economy. There will always be a limit to the amount of capital available for investment, so competing proposals must be assessed. For example, during the period 1834-1836, 75% of investment in new joint stock capital issues was in railway and banking shares.<sup>12</sup> Pollins estimated that 75% of Britain's railways were built between 1830 and 1870, and that some companies had capital levels of £30-40 million.<sup>13</sup> In the 1840s there was a crisis in railway investment and dividends and share prices fell as construction of lines had outstripped traffic demand. Again in the 1870s the dividends of railway companies fell and contractors were paid in discounted company shares. Investment in the water industry in the 1830s and 1840s had taken on a more stable image, and the returns were closer to debentures rather than the usual fluctuations expected with shares. Other ventures competing for capital were the overseas developments. Jenks showed that particular towns were responsible for raising capital for specific projects. For example, Liverpool invested heavily in Greece to help stabilise the Government.<sup>14</sup>

Capital sources for waterworks also varied considerably during the nineteenth century. From 1875, when the Public Works Loans Act established the Public Works Loans Commissioners (PWLC), Government loans increased considerably. In fact the take-up of government loans was used by John Simon as an indicator of sanitary progress in individual towns. This was possible because the competitive rates of

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<sup>9</sup> G. Kearns, 'Private Enterprise Rains O.K.?', *London Journal*, 12 (2) 1986

<sup>10</sup> W.M. Stern, *op.cit.*, p. 999

<sup>11</sup> J. Hassan, *op.cit.*, (1985), p. 545

<sup>12</sup> *Select Committee Report on Joint Stock Companies* PP 1844 VII Appendix iv, p.345

<sup>13</sup> H. Pollins, 'Aspects of Railway Accounting Before 1868' A. Littleton and T. Yarnley (eds), *Studies in the History of Accounting* (Illinois: Richard Irwin, 1956), p. 332

<sup>14</sup> L.H. Jenks, *The Migration of British Capital to 1875* (London: Thomas Nelson, 1938)

interest charged by the Board effectively meant they captured the market for local government finance. Simon could thus monitor capital investment through the activities of the PWLC. Between 1871 and 1891 over £50,000,000 was borrowed by local government from the PWLC. A breakdown of this total shows that urban sanitary authorities borrowed £3,225,500 for waterworks and £7,738,522 for sewerage systems.<sup>15</sup> The PWLC was not the only source of funding during this period. Loans sanctioned under other Local Acts, such as the 1875 Local Loans Act enabled municipal authorities to issue debentures and annuities certificates for loans approved by the Local Government Board. Government loans for waterworks totalled £53,000,000 by the end of the century.<sup>16</sup>

However before the 1870's local government was relatively limited in where it could find sufficient funding, and it must be remembered that much of the capital investment in waterworks happened before the era of the Public Works Loans Commissioners. Thus the location and size of local capital markets must be considered. Pollard makes the point that because of the close familial ties, capital was rarely invested outside of a local area until later in the nineteenth century.<sup>17</sup> However, capital was moved around the country through the banking system, which although centred on London, effectively partnered expanding economic areas with capital surpluses assuming that the rate of interest was acceptable, thus creating differentials in the interest rate.<sup>18</sup> Liverpool was one of the few regions with a sufficient capital surplus in the mid-nineteenth century to be able to invest in railways outside of the Lancashire region. Killick and Thomas state that there were only 4 provincial stockbroking firms in Liverpool in 1830, but that by 1847 this number had risen to 187.<sup>19</sup> The existence of a provincial Stock Exchange in a region was undoubtedly an advantage when it came to raising capital for municipal projects. Liverpool and Manchester formally opened their 'markets' in 1836, and during the railway boom of 1845-6 a number of other towns also established exchanges, codes of conduct and entry regulations.

A further stimulus to investment was the presence of a large group of 'gentlemen and professionals'. The analysis made by Killick and Thomas of the shareholders of four railway companies and the Leeds waterworks show that these

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<sup>15</sup> PP XXXVIII (1892) *Annual Report of the Local Government Board for 1891-92* p.cv.

<sup>16</sup> H. Finer, *Municipal Trading : A Study of Public Administration* (London, Allen and Unwin, 1914) p.20.

<sup>17</sup> S. Pollard, *Peaceful Conquest: the Industrialisation of Europe 1760-1970* (Oxford, Oxford University Press, 1981) p.36.

<sup>18</sup> L.S. Pressnell, *Country Banking in the Industrial Revolution* (Oxford, Oxford University Press, 1956) pp.254-56.

<sup>19</sup> J.R. Killick and W.A. Thomas, 'The Provincial Stock Exchanges 1830-1870', *Economic History Review*, 23 (1970) pp.96-111. See also A.G. Kenwood, 'Fixed Capital Formation on Merseyside 1800-1913', *Economic History Review* 31 (1978) pp.214-37. B.L. Anderson and P.L. Cotterell, 'Another Victorian Capital Market: A Study of Banking and Investors on Merseyside', *Economic History Review* 28 (1975) pp.598-615.

occupational groups were prominent investors.<sup>20</sup> Further research would be useful to identify how local government manipulated the stock exchanges when financing large projects. It is possible that those towns who were reluctant to take loans from the PWLC for political reasons were obtaining favourable rates of interest within their local capital markets. The implications for Liverpool Belfast and Glasgow for raising capital would seem to place Liverpool and Glasgow ahead of Belfast, which was comparatively isolated and had to rely mainly on local capital. Liverpool and Glasgow had relatively more access through provincial stock exchanges to national capital sources, if they could offer competitive rates of interest.

When allowances have been made for technical factors such as the relief of the locality and the amount of rainfall, it will be possible to attribute the variations in the respective histories of the water undertakings to specific causes. All three cities had problems with the quantity of water they could obtain locally. Belfast probably had the best supply and Liverpool the worst. When the populations are considered, both Glasgow and Liverpool show early increases, and Belfast, which starts from a lower base, does not experience the same rate of growth till the end of the century. Therefore in terms of the water available per capita it would seem that Belfast had the most favourable situation, with less stress being imposed on the system and the associated politics. Liverpool, however, had continued problems with the quantity of water it could obtain and this exacerbated the existing municipal disputes. Liverpool and Glasgow both follow the Hassan hypothesis, moving from private to public ownership of the water supply followed by large scale investment. Belfast provides a good contrast in that for the whole of the nineteenth century the water supply is controlled by a non-profit orientated organisation. Belfast therefore can be used as a marker to trace the evolution of a water supply system, and to try to establish an equilibrium between income through rates and expenditure through the expansion of the waterworks.

#### **4.1.a Water in Relation to the Public Health**

The issue of the water supply can be evaluated by assessing its importance to the public health of the three cities. The appointment of Medical Officers of Health happen in different sanitary situations in the cities. Liverpool was the first with the appointment of Duncan in 1847, Glasgow appointed Russell in 1865 and Belfast was the last with Browne in 1880, although there was an earlier attempt in the 1850s. Only Duncan therefore is involved in any of the early large scale expansions in the water supply networks and the associated debates on expenditure.

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<sup>20</sup> J.R. Killick and W.A. Thomas, *op.cit.*, p.100.

The water system is one of the most effective mediums through which the sanitation of an urban area can be improved. Sanitation is commonly identified in two different guises. Firstly, as a series of mortality rates by which the progress can be quantified and measured, and secondly, as a visual impression of the urban environment - do people look clean, are the streets free of refuse? Water affects both of these assessments. Flinn states that the main axiom of Chadwick's 1842 report on the Sanitary Condition of the Labouring Population of Great Britain was:

the correlation between insanitation, defective drainage, inadequate water supply and overcrowded housing on the one hand with disease, high mortality rates and low expectation of life on the other.<sup>21</sup>

The Royal Commission into the state of Large Towns and Populous Districts (which was more popularly known as the Health of Towns Commission) recommended that services such as water supply, paving, street cleansing and drainage should be provided locally under one administrative body.<sup>22</sup>

All the reports and inquiries of the first half of the nineteenth century recognise the problems manifest in the supply of water. Some of them find fault with the mode of supply, others with the lack of storage facilities, quantity supplied or the bias towards the wealthier customers. However, they all agree that the provision of water could, and must be, improved. The public health concerns revolved around the mortality rates for the larger towns and cities, and the public health theorists such as Chadwick, Simon and Southwood Smith recognised the connection between the major urban killers (typhoid, typhus, diarrhoea and cholera) and the supply of water. The implication had existed in urban culture for a considerable time that dirty people were unhealthy, and this concept has been well documented by Wohl.<sup>23</sup> The miasma theory, which had prevailed in medical thought for some time, had suggested that decaying matter gave off harmful gases. The first evidence of the importance of water rather than gasses in the transmission of disease came from John Snow in 1849 with his book *On the Mode of Communication of Cholera*.<sup>24</sup> Although cholera was not statistically important except in epidemic years, this new theory on the transmission of disease at least opened the minds of the campaigners to the concern with providing a pure water supply. Flinn suggests that:

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<sup>21</sup> M.W. Flinn (ed.) *Report on the Sanitary Condition of the Labouring Population of Great Britain 1842* by Edwin Chadwick (Edinburgh: Edinburgh University Press, 1965)

<sup>22</sup> *Royal Commission on the State of Large Towns and Populous Districts of the United Kingdom* PP 1844 XVII

<sup>23</sup> A.S. Wohl, *Endangered Lives - Public Health in Victorian Britain* (London: Dent, 1983)

<sup>24</sup> Snow traced the London cholera epidemic to particular infected water supplies within the city.

Cholera constituted a more direct threat to the wealthier classes because it was a water borne disease, and these classes enjoyed a more liberal access to a supply of water than did the inferior classes.<sup>25</sup>

The relationship between the water supply and the transmission of disease is now well understood. Recent publications by Guillerme, Goubert and Anderson have re-stated this correlation, but from technical and economic viewpoints.<sup>26</sup> The purpose of this chapter is therefore to provide details on how improvements in the water supply were effected, how much water was available for the individual city dweller, and how the provision of new waterworks affected or was affected by the municipal activities of the cities in question.

Much of the literature on water supply in nineteenth century Britain focuses on the issues of water purity. This encompasses a whole range of debates, from the initial quality of the source water, to how concepts of purity and methods of attaining purity changed throughout the period. Many aspects of these debates had direct implications for the choice of waterworks installed by towns and cities. Of course, they all came with different costs and benefits, and much of the legislation reflects the persistence of interests other than public health. Hamlin has made the study of water quality and analysis a central part of his research into British public health.<sup>27</sup> He documents the changing concerns of the public - from having sufficient 'clean-looking' water, to a demand for scientific assurances that the water contained nothing harmful.

How these broader 'water issues' fit into the water histories of Liverpool, Belfast and Glasgow is not immediately clear. Certainly, they all had problems with pollution of the old sources. In Liverpool and Glasgow this meant the wells under the city, in Belfast the main source at the beginning of the nineteenth century was the heavily polluted river Blackstaff. Thus although the major part of the demand for improved supplies rested on increased quantities, the quality of the water was also an impetus to change. This will be evidenced in the detailed description of Glasgow's private water companies, who had to relocate their waterworks so that they could remove more impurities through sand filtration. However, when Loch Katrine takes over from the river Clyde as the primary source of water for Glasgow, the pressure to reduce the industrial and sewage pollution of the river is considerably reduced.

Unfortunately for this thesis, the question of filtration does not loom large in the three cities studied here. A review of the contemporary literature (local newspapers and

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<sup>25</sup> M.W. Flinn, *op.cit.*, p. 10

<sup>26</sup> A. Guillerme, 'The Genesis of Water Supply, Distribution, and Sewerage Systems in France, 1800-1850', J-P, Goubert, 'The Development of Water and Sewerage Systems in France 1850-1950', L. Anderson, 'Fire and Disease: The Development of Water Systems in New England 1870-1900', in J.A. Tarr and G. Dupuy (eds) *Technology and the Rise of the Networked City in Europe and America* (Philadelphia: Temple University Press, 1988)

<sup>27</sup> C. Hamlin, *A Science of Impurity: Water Analysis in Nineteenth Century Britain* (Berkeley, University of California Press, 1990)

corporation minutes, etc.) does not reveal much concern with this method of ensuring water purity. A possible explanation for this low level of interest is that when the cities completed their large projects, the water they used was collected from unpopulated areas (therefore unlikely to be contaminated with sewage). As the water was held in reservoirs in these remote regions (Liverpool's water came from North Lancashire and North Wales, Belfast's from the Mourne Mountains and Glasgow's from Loch Katrine in The Trossachs) and then transported to the cities in sealed pipes, there was little chance of contamination.

Filtration in its simplest form entails passing the water through some pervious medium to extract 'solid matter', which usually meant sewage and other pollutants. It was therefore most essential for river water supplies which came from inland regions. Luckin has devoted considerable attention to the filtration issue by using the London water companies as case studies.<sup>28</sup> London relied on the Thames and its tributaries for most of its water, and by the time it reached the environs of the Metropolis it contained the sewage and waste of a number of towns, such as Hertford. The filtration medium used to remove these impurities was usually sand, and the first filter bed was used by the Chelsea Water Company in 1834. The process also required the advancement of *new engineering technology to enable the construction of large reservoirs which were strong enough to hold up to eight feet of filtration material.*

*The persistence of the official demands (through the General Board of Health, etc.) for better, and regulated filtration illustrates the growing realisation of the link between water and disease. However, as Luckin demonstrates, it was not until the 1870's that the transmission of cholera and typhoid was fully understood, and the filtration argument took on a wholly different perspective. It was accepted that filtration could remove 'mechanical impurities', but that sewage-contaminated water could still contain the 'poisons of disease'.<sup>29</sup> The name most closely associated with water analysis is that of Percy Frankland (1858-1946). His training in organic chemistry was a major stimulus to his development of the technique of using plate cultures in the 1880's to measure the bacteria present after various types of water filtration.*

#### **4.1.b The Nineteenth Century View on Water**

A direct correlation cannot be made between the amount of water available per person and improvements in sanitation. It is important to consider the way in which water enters the domestic environment, the frequency of supply, the hygiene habits of the population and the relative value they placed on a supply of water. For example,

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<sup>28</sup> B. Luckin, *Pollution and Control: A social history of the Thames in the nineteenth century* (Bristol, Adam Hilger, 1986)

<sup>29</sup> *ibid.*, p.46.

documenting the change from privies to water closets is not enough, it is more important to look at the way in which they were used - frequently emptied privies could still be more hygienic than infrequently flushed water closets.<sup>30</sup> When the use of water in the house is considered, Wohl provides some examples of how the poorer classes preserved water and recycled it. An enormous effort went into the struggle to attain cleanliness, with large amounts of the household budget being spent on soap and washing materials.<sup>31</sup> Many of the accounts collected for Chadwick's report in 1842 claimed that the main deterrent to the use of larger quantities of water was the distance it had to be carried from the standpipes into the homes. This arrangement was pre-disposed to cause more discomfort to the working classes who had limited time to collect water.<sup>32</sup>

A distinction must be made therefore between those areas which claimed a water supply problem, and those which had water available but lacked this infrastructure necessary in addition to reservoirs and pipes to deliver water into the home. When this test is applied to the three cities, it would seem that Belfast falls into the category of lack of infrastructure rather than lack of water in the locality. So the water is available but the city lacked the funds in the early stage to make the investment. In Liverpool the problem as identified in the parliamentary enquiries of 1846 and 1880, is one of lack of water in the locality to meet the needs of the expanding population. Glasgow did not really have a problem with either category. There was sufficient water available locally and the investment was relatively rapid after the corporation bought out the private companies.

Another important factor in the relationship between water and the public health was the campaign for the constant supply system. The transformation from intermittent to constant supply happened in most urban areas in the 1850s but it reverted back to intermittent at times when the quantity of water available was limited. Glasgow supplied water on the constant system from 1859 when Loch Katrine came on line. Liverpool achieved it in 1857 when Rivington was switched on, but the supply was barely sufficient and hot, dry summers interrupted the constant supply until the 1890s. In Belfast the conversion was temporarily made in 1870 when Bateman finished the Woodburn scheme. Improvements in the quantity of water supplied under the intermittent system would only benefit two groups. Firstly, those who had facilities for storing water in their homes in cisterns or water butts, and secondly, those who were situated close to standpipes where the time of supply was long enough for all the inhabitants to take as much water as they wished. It can be suggested therefore that it

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<sup>30</sup> P. Reeve, *Sanitation and Mortality in Liverpool 1847-1900* (Unpub. B.Phil. thesis, Open University, 1986) p. 101

<sup>31</sup> A.S. Wohl, *op.cit.*, p. 62

<sup>32</sup> M.W. Flinn, *op.cit.*, p. 142, evidence of the Rev. Elwin of Bath.

was only after the introduction of the constant water supply system that the whole population benefited from the increased amounts of water.

Wastage of water was a problem in most systems, and in Liverpool a waste water campaign was started in 1872. Measurements were taken and it was calculated that up to 50% of all water ran to waste.<sup>33</sup> This resulted in a major project to repair pipes. A similar concern for water wastage was evident in Glasgow and Belfast during the early periods of supply.

## 4.2 Private Supply

### 4.2.a Liverpool

In organising this chapter using a chronological framework, progress can be seen in terms of the quantity and quality of the water supplies, the number of people who received it and the areas in the city in which the supplies were most reliable. In Liverpool most of these improvements were made through Local and Private Acts of Parliament. Liverpool, up until the nineteenth century had almost always relied on 'artificial' sources for its water supply, not being endowed with springs or fresh water rivers in large enough quantities to support a growing population. Wells were sunk into the sandstone on which Liverpool sits, and up until the late eighteenth century the water was distributed by handcarts and buckets.<sup>34</sup> As demand increased, new wells were sunk on private property and the owners of course exacted a generous price from their captive market. The analysis of the water supply to Liverpool can be split into three sections:

1. Private Supply 1806-1847
2. The Municipal Buy-out and Rivington Pike 1848-1860
3. The Vyrnwy Scheme 1860-1900

This section is only concerned with the private period of supply. In the late eighteenth century several interested parties had taken up contracts to supply water to the inhabitants of Liverpool, notably Sir Cleve More who obtained permission through an Act of 1709.<sup>35</sup> In 1786 the Corporation of Liverpool obtained a local Act of Parliament to allow them to make agreements with landowners to supply water to the

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<sup>33</sup> *Report of the Borough Engineer on the Prevention of Waste and the Restoration of Constant Service* (Liverpool 1873)

<sup>34</sup> G.H. Pumphrey, *The story of Liverpool's Public Services* (Liverpool: Liverpool University Press, 1940), p. 120

<sup>35</sup> 8 Anne c.46 *An Act to enable the Corporation of Liverpool to make a grant to Sir Cleve More to bring fresh water into Liverpool.*



city.<sup>36</sup> A subscription was opened to pay for the necessary works and £80,000 was raised by the issue of 400 shares of £200 each. In addition to this sum, £15,324 was raised towards the installation of the pipes. It is not clear from the records when this body started to operate. The report for the 1847 Corporation waterworks refers only to the Corporation using the 1786 Act to open a subscription.<sup>37</sup> In 1822 an Act was passed to repeal the 1786 Act and to constitute the subscribers under this Act into the Company of Proprietors of the Liverpool Corporation Waterworks.<sup>38</sup> Obviously the links with the corporation were strong but as yet they were in name only. As the list of shareholders has not survived it is not possible to tell if the corporation had a financial interest in the company. This company was known as the Liverpool and Harrington Company, which distinguishes it neatly from its rival, the Liverpool Waterworks Company which was formed by Act in 1799, and became popularly known as the Bootle Company, as it was from that township that the supply of water came.<sup>39</sup> The description of the two companies being rivals is not strictly true. After persisting for several years in laying pipes in the same streets and competing for the same customers, they came to an agreement to divide up Liverpool and each to supply water as if they both had monopolies in the water market. The price each could charge was fixed by the Act of Parliament which had incorporated it.<sup>40</sup>

The Acts of Parliament by which these two companies were formed and later modified stipulated several conditions aimed at ensuring the basic rights of the consumer, and extending the benefit of the water supply to the urban area in general. The Bootle Company's Act of 1799 stated in section 15 the general terms of the engagement between the customer and the consumer:

the inhabitants of Liverpool may lay down service pipes to communicate with the company's mains, paying rent to the company for water as agreed.

Section 20 provides for the use of the company's water to put out fires 'without entitlement to compensation'. Clearly there was some attempt to ensure that the supply of water was not totally governed by profit. The Bootle Company grew rapidly from its inception in 1799. Local Acts of Parliament in 1810 and 1813 extended the district to which it could supply water to include Bootle, Linacre, Kirkdale, Everton and West Derby.<sup>41</sup> Powers were given to allow the company (with permission of the landowner) to make cuttings, aqueducts and reservoirs within these districts, but this did not entitle

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<sup>36</sup> 26 Geo. III c.xii *Liverpool Improvement Act*

<sup>37</sup> Water Committee *A Century of Progress*, p. 2

<sup>38</sup> 3 Geo. IV c.lxxxvii *Liverpool Water Supply Act*

<sup>39</sup> 39 Geo. IV c.xxxvi *Liverpool Water Supply Act*

<sup>40</sup> Bootle Company section 15. Liverpool and Harrington Company section 36.

<sup>41</sup> 50 Geo. III c.165, 53 Geo III, c. cxxii

the landowner to help himself to water channelled through his land. In 1847 the company was reviewed prior to the corporation buy-out.<sup>42</sup> The achievements looked impressive on paper for such a young company (only 48 years old). The source of water was three main lodges at Bootle supplemented by an additional eleven bore holes to meet occasional peaks in demand. From here the water was pumped using four steam engines to the company's reservoirs at Crosby Street, Everton Valley, Eaton Street, Church Street, Devonshire Place and Atherton Street. The water mains stretched for approximately 126 miles and delivered a daily quantity of 994,520 gallons.

For the domestic supply, more detailed evidence is provided by the report on the 1847 Bill, which stated that an average of 47 gallons was supplied to each house.<sup>43</sup> The company gave the average household size as 6.65 persons and therefore the company claim to have supplied 7.2 gallons per person per day. The accuracy of this figure is questionable when one considers the context in which it is presented. The figures form part of the Parliamentary evidence submitted by the Corporation of Liverpool to substantiate their claim that a new water supply was desperately needed for the city to relieve problems of water shortage and the ensuing public health crises. It would be in the corporation's best interests therefore to underestimate the daily personal water supply, as this would give more credence to their plan for the Rivington water-works. However, the figures can be interpreted in another way. It must be remembered that this 1847 Bill was for the corporation to gain permission to purchase the two water companies. It would thus be in the interests of the companies to show in the statistics on their performance an over-estimation of the amount of water they supplied to the people of Liverpool. By doing this they could undermine the Bill in two ways. Firstly, if they could prove that they already supplied more water than the Liverpool demanded, using their own wells, they could show that the Rivington works were an unnecessary expense. Secondly, by producing such 'rosy' information on their own performance they had a chance in persuading Parliament and Liverpool that the supply was managed efficiently in private ownership, with any profit being channelled back into the waterworks rather than syphoned off to subsidise less economical municipal schemes.

The supply of water to the notorious court dwellings was a particularly contentious matter, given the contemporary pressure from the Medical Officer of Health (Dr. Duncan) to reduce the levels of disease through measures to improve the water supply, housing and other associated services.<sup>44</sup> The Bootle company had in their report for the Parliamentary committee stated that in 1846 they had supplied 757 courts

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<sup>42</sup> PP 1847 XXI *Report of the Commissioners of Her Majesty's Woods, Forests, Land Revenue, Works and Buildings on the Liverpool Waterworks Bill.*

<sup>43</sup> *Ibid.*, p. vii

<sup>44</sup> *Ibid.*, p. 103

which contained a total of 4,498 dwellings. They gave the following analysis of the method of supplying water:

Table 4.2 Bootle Water Company - Supply to Courts in 1846

Delivery Mode	No. Courts	No. Houses
pipe per house	608	3691
cistern	20	125
standpipe	129	682

Figure 4.2 at first glance appears to show a reasonable supply to homes within courts - 3691 houses are served by their own pipes, which removed the need to queue for water at the standpipe. However, the data does not convey the limited time when water would be available for drawing from house pipes. The water would be turned on by the turncocks a maximum of three times a week, usually late at night or early in the morning. Residents who did not have the luxury of cisterns connected to the mains had to use a variety of containers to get enough water to supply them for the next two days. The water was often only turned on for 15 minutes. Cisterns were seen by the householders as the best method for water storage, but frequently the higher placed ones in respect to the height of the supplying reservoir would not get water if the turncock shut off the supply too quickly. Dr Duncan objected strongly to the use of cisterns, especially lead lined ones which he supposed contaminated the water and caused lead poisoning.<sup>45</sup> This discussion also appears in Glasgow when the Loch Katrine scheme is discussed, as the proposed water course flowed over lead deposits. However, after a scientific investigation, the effect of lead on water was dismissed as unarmful. Dr Duncan also gave examples of water smelling foul when it had been kept in cisterns for a long period of time during hot weather.<sup>46</sup>

By 1847 the implications of water supply for public health had raised the issue of the quantity of water available to the household. One simple way to increase the amount of water that was used was to provide a constant supply, but this would mean extra expense in pumping the water from the wells, and distributing it. Thus for mainly financial and technical reasons, the advice to the water companies to progress to a constant supply system was effectively ignored. In the evidence to the 1847 Parliamentary committee the main complaint against the water companies was the intermittent supply to the poorer districts. Complaints especially came from landlords

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<sup>45</sup> *Ibid.*, p. 103

<sup>46</sup> *Ibid.*, p. 103

with property in the Scotland road area of the city where the majority of houses were arranged in courts .

The Liverpool and Harrington company operated a very similar system to that of the Bootle company. The Acts of Parliament relating to its formation contain almost identical clauses - specifying the terms of engagement between the landlord and the water company and the rates charged for the supply, which were related to the rentable value of the property.

There are separate provisions for the rating of shops and the cost of water supplies to shipping. The 1827 Act extended the area of supply to include the villages of Harrington and Toxteth Park, provided that the company purchase land within the district within three years. The 1846 Act was passed because of the strain put on the resources of the company.<sup>47</sup> Their existing borrowing powers were only £30,000 but due to the rapid rate of population growth in the city, and the need for a new water infrastructure, the limit was raised initially to £60,000 and a further subscription authorised to raise additional capital of £200,000. Section 23 of the Act made it compulsory for consumers to take water for a minimum of three years, with the amount of their annual rate calculated as a tenth of the cost of laying pipes to their property. This again highlights the possible obstacles which private operational systems could create which would blunt the public health incentives of an extension of the water supply. The lag in construction in this case, as in many others is due to financial constraints - the requirement to sustain the dividend rate for shareholders through limiting capital expenditure to 'safe' areas of the city where a return could be guaranteed. The works of the Liverpool and Harrington company were larger than those of the Bootle company, supplying 3,003,600 gallons per day to 30,303 houses. There were 5 main pumping stations at Copperas Hill, Bevington Bush, Toxteth, Soho, and Windsor Well. 1940 courts were supplied thus:

Table 4.3 Harrington Water Company - Supply to Courts in 1846

Delivery Mode	No. Courts	No. Houses
pipe per house	1576	9456
cistern	41	246
standpipe	323	1938

Both the water companies had compulsory purchase clauses in the Acts of Incorporation, giving the Corporation the facility of buying them out within a certain time limit. The Acts do not make it clear if this was a 'safety valve' arrangement so that

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<sup>47</sup> 26 Geo. III c. xii; 7 & 8 Geo. IV c.xxxvi; 9 Vict. c.xxxv. Rentals specified in section 36 of 3 Geo. IV c.lxxvii

the Corporation could keep some degree of control over the companies, or whether the Corporation had foreseen that one day it would want to have full control over the water supply. After the companies came to their arrangement to divide up the city and to create two mini - monopolies, there were no sustained efforts to improve the quality of the supply for the customers. The evidence given for the 1847 Bill provides us with a detailed insight into the operations of the two companies, especially through the investigations of the two surveying officers - John Herbert, a barrister of Lincoln's Inn and Thomas Page, a civil engineer from London. They made visits to a number of courts, accompanied by Dr. Duncan and Mr. MacDonald of the Liverpool and Harrington Water company. Residents complained of the infrequency of the supply, and the reluctance of the companies to provide cisterns to hold the water. Dr. Duncan made a strong claim that the rate of mortality in Liverpool was exceptionally high because of the lack of plentiful and pure supply of water.<sup>48</sup> The water from the wells tended towards hardness, making it unsuitable for manufacturing and causing an 'unnecessary expenditure on soap'. Thus the public health argument for the municipalisation of the waterworks was articulated through mortality rates and the Medical Officer of Health. However, the commercial interests of Liverpool were presented in an equally compelling way.

The surveying officers also heard evidence on Liverpool's record of fires and the associated loss of property. Liverpool had acquired a national reputation for the frequency with which it experienced fires, and more particularly, the inability of the fire police to bring them under control. Between 1838 and 1846 there had been 990 fires in Liverpool, resulting in a loss of property valued at £2,567,291.<sup>49</sup> Mr. Dowling, the head constable of Liverpool and superintendent of the fire police suggested that the water companies were not keeping the mains under sufficient pressure as required by the Acts of Incorporation.<sup>50</sup>

The provision of water by the private companies was generally chaotic, profit-motivated and irresponsible in respect of the duties required of them towards the provision of a public health system for Liverpool. Public hostility towards the two companies was considerable. Complaints made directly to them concerning such problems as lack of pipes or the disruption to pavements rarely brought about any action. However, the companies profited substantially, despite their poor operational record. Samuel Holme showed how the value of the companies shares had risen. The Bootle company shares with a face value of £100 were worth £380 in 1845, and the

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<sup>48</sup> PP Minutes of Evidence 1847 XXI Report on the Liverpool Waterworks Bill. p. 37. Evidence of Robert Santhouse - Estate Agent: p. 103

<sup>49</sup> *Ibid.*, p. xiii

<sup>50</sup> Evidence from the fire police book as used by S. Banner and S. Holme *Water - A Pamphlet* (Liverpool 1845) LRO

Liverpool and Harrington company's shares with a face value of £100 were worth £610 in 1845.<sup>51</sup>

The Corporation Water Committee minutes for 27th March 1848 contain some of the accounts for the private companies, showing that they made a combined profit in the year to 31st December 1847 of £33,685 on a capital of approximately £660,000, thus showing a return of nearly 20%. This perhaps justifies Mr. Williams' accusation that the water companies were increasing their profits by refusing to carry out essential maintenance work of providing sufficient water.<sup>52</sup>

#### 4.2.b Glasgow

Glasgow provides us with another permutation in the range of nineteenth century water supply arrangements. In Belfast the supply remained in the hands of a non-profit organisation throughout the century, while in Liverpool there was a 'cartel' of water companies, followed by a Corporation buy-out. Glasgow allows us to look at another permutation - a real situation of competition in the water industry, in which there were two companies operating in the same market. If Liverpool epitomises the private water company as identified by Hassan and Falkus, Glasgow's experience demands that this traditional model is revised.

There is a considerable amount of information available in the archives for Glasgow, which does not exist for other cities, which make it possible to re-construct the basic operations of the companies - investigating how they utilised the profits, their costing mechanisms and growth strategies. When allowances have been made for 'natural' advantages such as the sources for water, the final analysis will have to conclude whether it was possible to efficiently provide a commodity like water using a system of private profit-orientated organisations. The private period of water supply in Glasgow can be divided into three separate sections:

1. Pre 1838 multiple private enterprises
2. 1838 - 45 monopolistic private control
3. 1845 - 55 multiple private enterprises

Glasgow's early water history is very similar to that of Liverpool, starting with individual wells and then progressing to the formation of private companies. Glasgow had over 30 wells in 1801 which were able to supply a population of 83,805.<sup>53</sup> These wells were open to pollution from surface water and from rubbish and increasingly

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<sup>51</sup> *Ibid*, p.5

<sup>52</sup> PP 1847 XXI Report on the Liverpool Corporation Waterworks Bill p.30. Question 380

<sup>53</sup> J. Burnet, *History of the Water Supply to Glasgow* (Glasgow: Bell and Bain, 1969), p. 2

from subterranean sewerage pollution which found its way through the water course. There had been proposals throughout the latter part of the eighteenth century to bring water into the city from new sources, but it was not until 1806 that the first definite steps were taken to organise water supply on a commercial basis. In this year the Bill to create the Company of Proprietors of the Glasgow Waterworks was given Royal Assent.<sup>54</sup> The preamble of the Act stated that

that it is of great consequence to the inhabitants of the said city and suburbs that they should have a constant supply of water.

It is interesting to note here that a committee of the council formed in 1836 for the purpose of establishing the legal obligation incumbent on the two water companies came to the following conclusion

the legal import of a constant supply appears to be a continuous or uninterrupted supply for the whole 24 hours of the day and night - but I do not observe that any obligation to afford such a constant supply is introduced in the enacting clauses of the Statute.<sup>55</sup>

The Corporation of the city had, from the inception of the first water company, endeavoured to maintain some degree of control over the actions of the water companies. The Town Council took 20 of the £50 shares, of which 2000 were issued to raise a capital of £100,000. The Lord Provost was a member of the water company's managing committee. Clauses were inserted in the Act to ensure that all the inhabitants of the dwellings could be supplied with water, setting maximum and minimum rates, and providing a system through which complaints could be made:

if any persons receiving a supply ... shall be dissatisfied with the sufficiency thereof, every such person may complain in due form of law, to the magistrates of the city of Glasgow, giving 14 days notice in writing of such intention to complain, and the matter of complaint to the said company: and the determination of the magistrates upon such complaint shall be final and conclusive...<sup>56</sup>

The waterworks of the Glasgow Water Company were based at Dalmarnock, two miles above the city on the river Clyde, from which the water was pumped. After passing through natural sand filtration beds the water was transferred to reservoirs in Sydney Street, Drygate and Rottenrow. The Glasgow company enjoyed only two years of monopoly until in 1808 the Cranstonhill company was formed by Act of Parliament.<sup>57</sup> The preamble to the Bill puts forward a solid argument against a monopolistic supply of

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<sup>54</sup> 46 Geo. III c.cxxxvi.

<sup>55</sup> Committee of the Council relevant to the Acts incorporating the GWC and the CHWC 14.3.1836; p. 245

<sup>56</sup> *Ibid.*, p. 246

<sup>57</sup> 48 Geo. III c.xliv

water as harmful to the interests of the public, but like the Glasgow company it does not commit itself to a constant supply in the specific clauses of the Act. The capital of the Cranstonhill company was substantially less than that of its rival - only £30,000 in £50 shares with an option to raise a further £10,000. The Town Council however did not decide to take any shares in this venture. It is not clear why - maybe they had some intuition that it would not give the same returns as the Glasgow company, or perhaps their attempts to manipulate the Glasgow company had proved ineffective or unnecessary. The new company set up its operations one mile downstream of the city at Anderston where it raised water from the Clyde and carried it to reservoirs at Cranstonhill.

From 1808 till 1838 these two companies operated in direct competition, laying pipes in the same streets. Burnet claims that in some streets there were four or five lines of water pipes which had imperfect stopcocks and did not conform to any type of plan, to such an extent that only a few of the workmen knew where the pipes were.<sup>58</sup> However, one must consider when evaluating their respective successes, that the Cranstonhill company started from a smaller capital base, and that its geographical position was fundamentally flawed. This extract from Ferguson neatly summarises the dilemma of the Cranstonhill company:

Prior to 1790 there were no common sewers in Glasgow, but in that year the New Town Building Company made the first one in the city ... by 1820 there were common sewers in 45 streets in the Royalty, extending over 5 miles in length ... but the Clyde remained virtually an elongated cesspool.<sup>59</sup>

Both companies obtained further Acts to extend their borrowing powers, and for the Cranstonhill company to move its works upstream to Dalarnock to escape the increasing pollution of the Clyde.<sup>60</sup> The capital expenditure of the two companies is shown in figure 4.3, the peak in 1821 for the Cranstonhill company indicating the relocation of the works. The Glaswegian municipal historian Bell makes an unsubstantiated claim that the two companies 'fought each other with unremitting violence'.<sup>61</sup> However, from the evidence available it would seem more plausible to suggest that they slipped into a relationship of passive tolerance. Glasgow, like Liverpool, during its period of private competition had a suppliers market, with the demand for water constantly outpacing the supply. They would certainly not have been fighting to secure customers as they could scarcely fulfil their obligations to the existing ones.

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<sup>58</sup> J. Burnet, *op.cit.*, p. 131

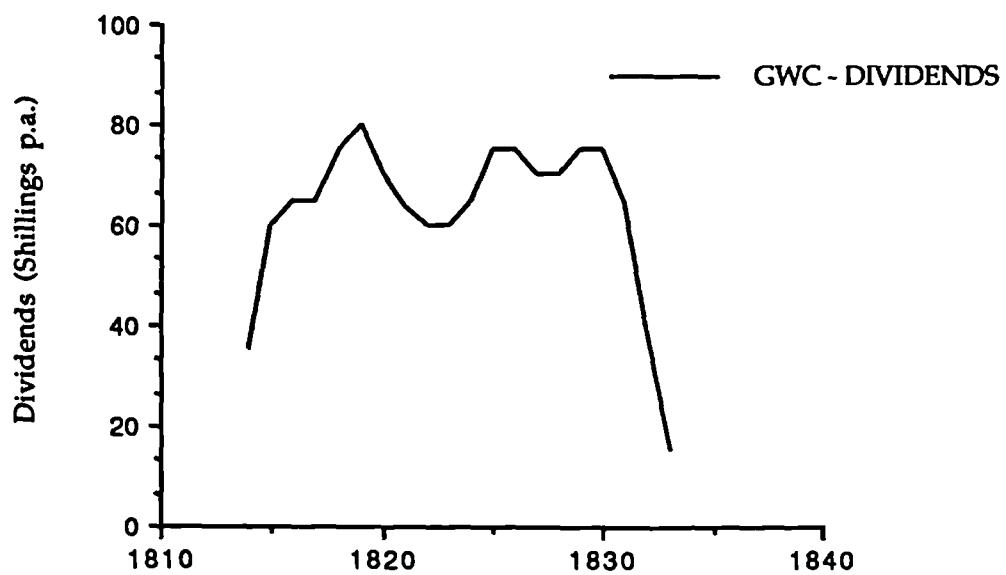
<sup>59</sup> T. Ferguson, *The Dawn of Scottish Social Welfare* (London: Thomas Nelson, 1948), p. 163

<sup>60</sup> 52 Geo. III c.52-CHWC; 59 Geo. III c.117 - CHWC; 59 Geo. III c. 67 -GWC

<sup>61</sup> J. Bell, *Glasgow, its Municipal Organisation and Administration* (Glasgow, 1896), p. 236



*Figure 4.1 Glasgow Water Company - Dividends Declared 1809-1833*



*Source: GWC Annual Accounts 1809-1835*

It is necessary to look in more detail at the financial transactions of the two water companies. Starting with the Glasgow Water Company, the first accounts and reports available are from April 1814. They do, however, contain a little retrospective information. The company had already issued 1547 shares from its total of 2000. There were 131 shareholders who held 4 or more shares and were thereby eligible for election onto the committee of management. This was a body of 8, plus the Lord Provost. Three of the committee retired each year but were eligible for re-election. GWC had already laid over 60,000 yards of pipes and was planning further expansions:

to lead pipes into every direction in the city ... where there is an immediate certainty of receiving 5% on the outlay, with a rational prospect of ultimately realizing more.<sup>62</sup>

The second report in 1815 is very self-congratulatory. They have been able to raise the dividend from 35s. to 60s. and could have paid more were it not for the delays in collecting the water rents which had led to a temporary liquidity problem.<sup>63</sup> They anticipated the value of GWC shares remaining at £60 and were considering releasing a small number more onto the market. By 1816 the GWC had discharged all its obligations under the Act of Incorporation i.e. to establish a contingency fund of £6,000 and they also had paid their loan of £3,080 from the Glasgow Bank. Obviously only the most financially secure companies would find themselves in this position after 10 years of trading.

By April 1816 an additional 201 shares had been sold (20 by public sale at £74 and 181 by private contract at £75).<sup>64</sup> This raised the capital of the company to £82,020. The 1817 report to shareholders makes rather a smug comment on the current economic situation in the country:

The result of the whole exhibits the pleasing prospect that if, in the face of universal suffering, the income has not declined, it will maintain a steady and progressive advance with the returning confidence, credit and prosperity of the country.<sup>65</sup>

The GWC do not seem to have re-invested much of the surplus in the extensions to the works during 1816 and 1817 unless they temporarily changed their accounting methods and the information has been lost. They certainly were keen to invest outside the water industry - the Government stock which was bought with the money set aside as the contingency fund was sold in October 1817 for a profit of £1471 thereby showing a return of 24% on the original investment made 20 months

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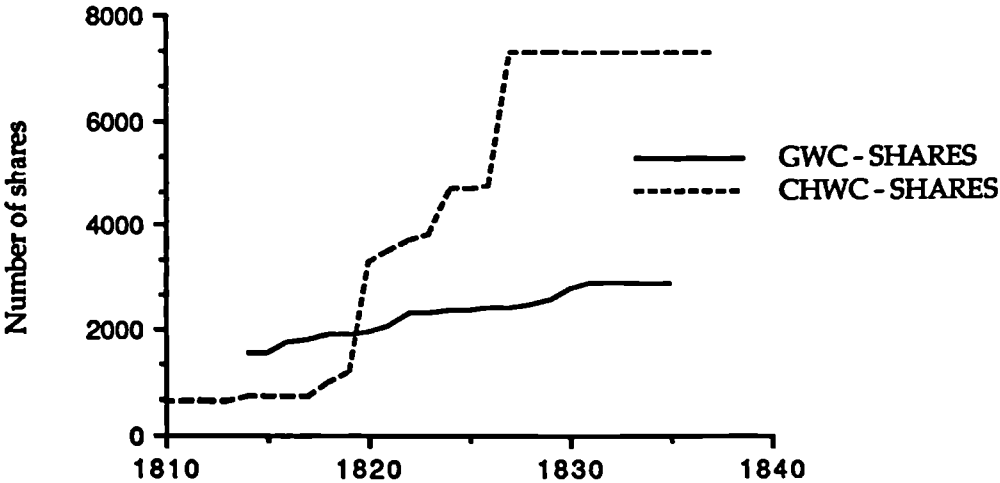
<sup>62</sup> *Second Report of the Committee of Management of the Glasgow Waterworks to the Proprietors for the year ended 1.4.1815* (hereafter shortened to Report GWC)

<sup>63</sup> The issue of dividends was very important, despite the fact that this water company was one of the best investments in Glasgow.

<sup>64</sup> *Third Report of GWC to 1.4.1816*

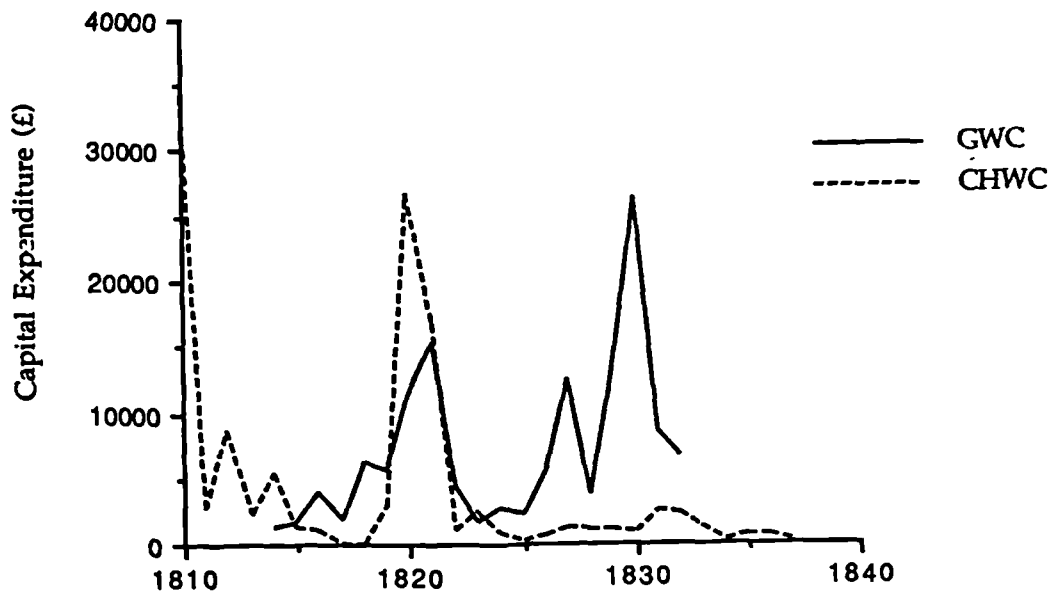
<sup>65</sup> *Fourth Report of GWC to 1.4.1817*

**Figure 4.2 Glasgow Water Companies - Shares in Circulation 1809-1838**



**Source: GWC and CHWC Annual Accounts 1809-1838**

*Figure 4.3 Glasgow Water Companies - Capital Expenditure 1809-1838*



*Source: GWC and CHWC Annual Accounts 1809-1838*

previously. This bonus was paid out to the shareholders as 15s. per share. In the 1818 report there is a crucial review of extensions made to the works which included a new engine in Duke Street and a 12 inch main pipe to improve the supply to the western extremity of the city.<sup>66</sup>

In 1819 a new Act of Parliament was obtained by which the capital of the GWC was increased from £100,000 to £200,000 and permission was given to borrow £50,000 on the credit of their property.<sup>67</sup> The contingency fund was also abolished and the £6,000 used to improve the works.<sup>68</sup> The directors of the company stress in the annual report that there have been problems with the collection of rents and that the company must raise £16494 to finance the works that they have already entered into. By 1821 the directors are once again congratulating themselves on the improvements to the works:

every facility is afforded, to answer the demand and to increase the consumption. Little now remains to 'perfect' the establishment<sup>69</sup>

The number of shares in circulation increased to 2307 in 1822 as the company continued its policy of offering further sales of shares instead of increasing the bank debt. The price of shares was also increasing. In 1824 59 shares were sold (47 at £90, 10 at £95 and 2 at £100). The number of shareholders with 4 or more shares had increased from 131 in 1813 to 164, but in terms of a percentage of the total number of shares held it fell from 8.46% to 6.9%, perhaps reflecting the higher value of the share. In 1825 100 shares were sold at £100 each and further extensions to the works were planned - a longer tunnel through the filtering bank and an additional steam engine.

The period from 1829 through to 1832 was a relatively bad one for the company. Although they were supplying 31,969 houses with water in 1829, there was a fall in share prices to £62 in 1832 and the receipts fell by £2530.<sup>70</sup> This led the directors to comment in the annual report that:

That the directors have not a larger dividend to declare, occurs, in a great measure, from the reduction made last year of 25% on the principal part of the rental of the company - a measure rendered imperative by the operations of another company, and which, though injurious to themselves and to the interests of this company, had to be followed.<sup>71</sup>

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<sup>66</sup> *Fifth Report of GWC vol.4.1818*

<sup>67</sup> 59 Geo. III c.67.

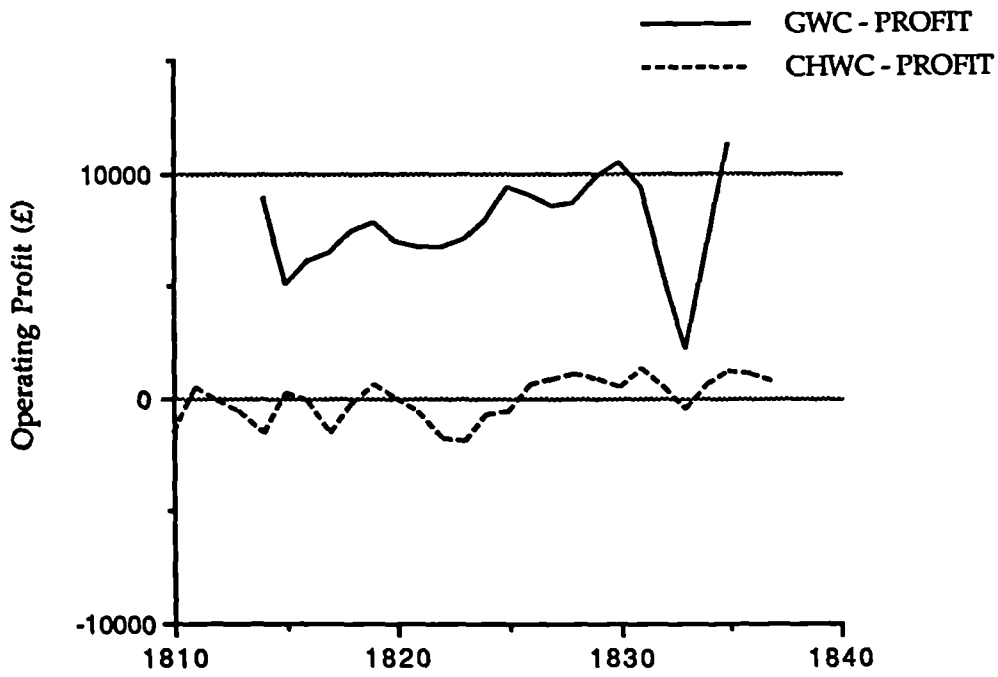
<sup>68</sup> However, the following year due to increased revenue, the £6,000 on works was repaid and disposed of among the proprietors at £3 per share. Therefore the ultimate gain was not to the water system but to the shareholders.

<sup>69</sup> *Eighth Report of GWC to 1.4.1821*

<sup>70</sup> See table

<sup>71</sup> *Nineteenth Report of GWC to 1.4.1832*

*Figure 4.4 Glasgow Water Companies - Operating Profit 1810-1839*



*Source: GWC and CHWC Annual Accounts 1810-1839*

In 1833 the situation worsened and the dividend was only 15s. For the last 5 years they had increased their overdraft and were therefore incurring additional interest charges. The sale of shares by which they could have reduced their debts had stagnated - no shares were sold between 1831 and 1835. In 1835 the situation seemed to improve and the revenue reached an all-time high of £16,516, although it is not clear how much of this income is arrears. If the 1832 report of the Glasgow Water Company is to be believed, the declining fortunes were due to the actions of a rival company. They could only be referring to the Cranstonhill Water Company. Was this small competitor a real threat or merely an excuse for the poor management of the GWC? When the accounts of the CHWC are scrutinised it is obvious that their performance was unpredictable. Between 1810 and 1837 they showed an operating profit for only 14 of the 27 years.<sup>72</sup> When the expenditure on works is considered there are two clear cycles. Firstly, the establishment of the works at the Cranstonhill site and secondly, from 1819, a large expenditure on relocating at Dalmarnock. This would undoubtedly keep net profit low but the key to explaining the periods of operating losses is the comparatively poor revenue.

The price of shares is always a good indicator of the contemporary opinion of the public. Cranstonhill shares were initially offered for sale in 1809 and did not reach their face value of £50. The total for the 500 sold was £23,892 - an average of £47.78 per share.<sup>73</sup> By 1819 however, there were 2392 shares in circulation, held by 1196 shareholders. Like the GWC the Cranstonhill Water Company annually elected a committee of management of 7 of the shareholders, who held at least 4 shares each. The CHWC do not seem to have been as professional or open about the operations of their company, prompting this statement in 1822:

In 1808 the Cranstonhill Water Company was incorporated by Act of Parliament, and during the course of 13 years £101,493 sterling was expended, principally in operations and experiments of the most disastrous description. No dividends were ever declared. Even an intelligible and satisfactory account of the company's affairs was not exhibited for several years: in short its concerns were enveloped in a degree of mystery which tended to excite much apprehension.<sup>74</sup>

An accountant was therefore called in to audit the books of the Cranstonhill company in 1822 and the net loss to the company was calculated at £12,969. This did not deter investors. In 1825 a list was published of the shareholders which gave the additional

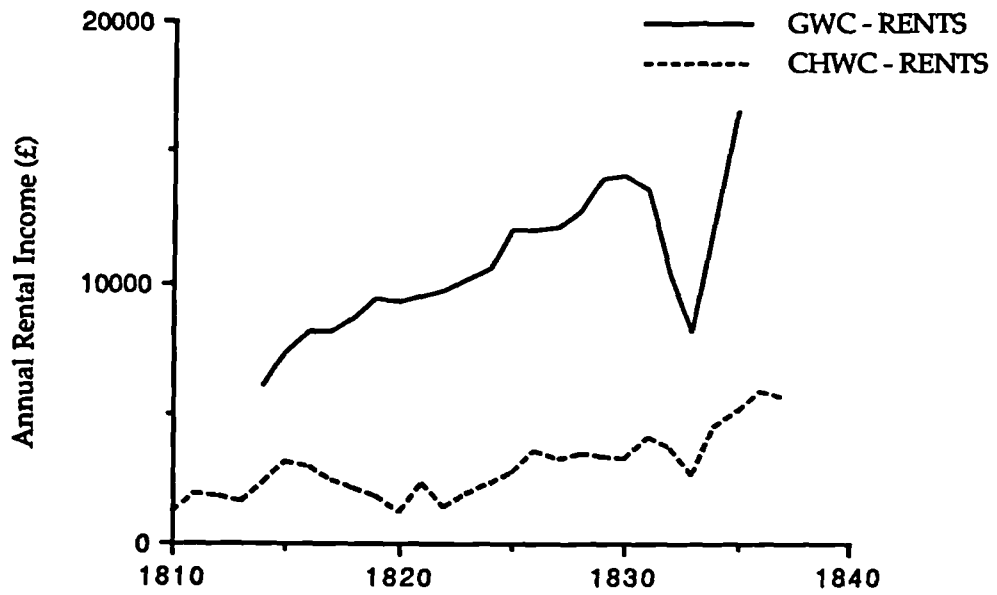
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<sup>72</sup> Operating profit is the annual difference between income and expenditure. It does not accommodate the brought forward surplus or deficit.

<sup>73</sup> This is calculated from the first balance sheet 1.5.1809 to 1.5.1814

<sup>74</sup> Report of the Committee of Accounts appointed by the Proprietors of the Cranstonhill Water Company 9.5.1822

*Figure 4.5 Glasgow Water Companies - Income from Water Rents 1810-1839*



*Source: GWC and CHWC Annual Accounts 1810-1839*



information of how many shares each person held. 19 shareholders held over 50 shares each, the biggest single investor holding 200 shares.<sup>75</sup> By 1826 the problems of the company's debt were still evident, and the management committee took steps to sell off unused assets in the form of vacant land in the city and also to offer remaining unsold stock in the company to the existing shareholders at a fixed price prior to the public sale. The 1831 report to the shareholders is the most optimistic one to date. The quality of the water had been improved and by erecting further reservoirs in the city they were becoming more of a threat to the established business of the Glasgow Water Company. It now seems that they were beginning to encroach on each other's customers. The annual report for 1832 of the Cranstonhill company states that:

In explanation of the decrease which appears in the amount of receipts, the directors have to state that they found it necessary in the beginning of last year to make a reduction in the rates of 25%. This was done to check what they considered, an undue system of competition, as they were credibly informed that public works were supplied by the Glasgow Water Company at rates varying, for an equal quantity from between £3 to £15: the object of which difference of charge, could not be mistaken.<sup>76</sup>

The two companies came to an agreement in June 1833 to amalgamate their operations, thus providing a more efficient and no doubt more profitable service to the city of Glasgow. Despite early problems which were caused primarily by the unfortunate choice of site, the Cranstonhill Company rallied and finished its life as a 'going concern'. It placed more emphasis on improving the waterworks rather than on securing a dividend for the shareholders. This company clearly substantiates Hassan's model which suggests, that with increasing pressures, the small private water enterprises could not continue in business.<sup>77</sup> However, in this case, the private company opts for joining a more profitable concerns which has already made the large investments and still has surplus revenue to declare dividends.

The first Bill to amalgamate the two companies was introduced to Parliament in 1833 but it was defeated mainly due to opposition from the Town Council, who argued that it would deprive the customers of the benefit of the competition which they still supposedly had at that time. They tried again in 1836 and again the Corporation opposed them, this time with their own Bill to acquire the waterworks. The two

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<sup>75</sup> A comparison was made between the lists of shareholders for the two companies. There were 12 names which appeared on both lists, although the accuracy of the information is questionable and there is no supporting information giving occupation or address.

<sup>76</sup> Report CHWC 16/6/1832

<sup>77</sup> J. Hassan, *op.cit.*, (1985), p. 9

companies finally got their Act in 1838, despite opposition from the Corporation, but there were several important restrictions.<sup>78</sup> The capital of the new company was reduced from £326,050 to £267,550. The future dividends were to be restricted to 7% on the capital and the maximum rate levels were set. The only 'loop hole' which remained for the company to exploit was that there was no clause requiring pipes to be laid where 'necessary' but only to give a supply where they had previously done so.<sup>79</sup> Other compulsory clauses included an obligation to supply the police department with water for street cleaning and also to keep the mains charged constantly. Thus Parliament had effectively constrained this private company and it emerged from the encounter as little more than a Corporation puppet. The potential for gradual expansion of the company was not in question as profits could be re-invested, but by limiting the return to the shareholder, the Act effectively discouraged the speculator who had previously found the water companies so inviting. The limitation on the capital of the company also reduced the ease with which new schemes to supply the city with water could be entered into - any large expenditures would have to be sanctioned by a further Act of Parliament.

There are limited amounts of data available for this phase in Glasgow's water supply history, but it seems that the newly amalgamated Glasgow Water Company continued to operate as before. Pipes were only laid in streets where a return on the investment could be anticipated and small improvements were made in the supply system. The population of the city was increasing rapidly, reaching 700,000 by 1845 and it was becoming clear that the water raised by pumps from the river Clyde was no longer sufficient to meet the needs of people and industry. A large scheme was needed to bring in water from the surrounding area. Unlike Liverpool, there were good sources of water comparatively near Glasgow. Loch Lubnaig, Loch Katrine and the Earn Water were all considered during the period from 1835 to 1845. The deterrent to the various speculators was the cost of initiating such a large project. The Glasgow Company obtained an Act of Parliament to allow them to bring water from Loch Lubnaig, but later found that they had underestimated the expense and they shelved the plans.

In 1846 a partial solution emerged for the city's water problem. A new private company was formed by Act of Parliament to supply water by gravitation from the Brock burn to the south of the city.<sup>80</sup> This new company was called the Gorbals Gravitation Water Company, as initially it only supplied that part of Glasgow which lay south of the Clyde. This area had suffered most from the 'justifiable expansion' scheme

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<sup>78</sup> 1 & 2 Vict. c.86 It is interesting to note the lack of co-operation between the corporation and the police committee in opposing the amalgamation - they refused to share information. *Council Minutes*, 22.3.1838, p. 461.

<sup>79</sup> J. Burnet, *op.cit.*, p. 9

<sup>80</sup> 9 & 10 Vict. c. 347

the Glasgow company had used. The Gorbals company was placed on a similar footing to the other company, with a capital restriction of £120,000 and dividends limited to 7%. The shares were valued at £10, thus putting them within reach of the smaller investor. Water from the Brock impoundment arrived in the city in 1848 and the works were extended by two more acts in 1850 and 1853. It had also been suggested that the Gorbals company was more efficient:

The Gorbals company ... had approached its problem rather more realistically and in a more public spirited way; and had it been earlier in the field or had there been less financial stringency at the turn of the half century, there is just the possibility that this company might ultimately have become the sole water authority for the whole area.<sup>81</sup>

Bell claimed that the revenue of the Glasgow Water Company fell by £4,000 when the Gorbals Company started trading.<sup>82</sup> In 1847 an attempt had been made to amalgamate the two companies, but again the Corporation opposed it and the Bill was withdrawn from Parliament. What emerges from this period however, is the fact that the Gorbals scheme did not assuage the efforts of the Corporation to transfer the water supply into their own hands and to embark upon a monumental project to permanently remove all doubts about the source of Glasgow's water.

#### 4.2. Conclusions on Private Waterworks

The main issues which need to be addressed in this section are firstly the hypotheses concerning the economics of supply, in particular, Hassan's model.<sup>83</sup> Secondly, the municipalisation debate as discussed by Kellet, Falkus, Waller and Frazer must be put into the context of water supply in the respective cities.<sup>84</sup> Thirdly, the mortality debate on the role of water in the urban environment has to be considered.

The lack of financial information for Liverpool makes detailed testing of the Hassan model impracticable, but the Glasgow data allows for the central tenets of his ideas to be investigated. To recap, Hassan suggests that the decline in the number of private water companies in the middle of the nineteenth century was due to several factors, notably their inability to raise the large capital sums to finance the huge schemes now needed by the expanding urban centres, the short run profit goals that the shareholders expected and the failure of the market. By using secondary evidence for Liverpool in the form of the 1847 parliamentary enquiry and the Royal Commission

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<sup>81</sup> Glasgow Corporation *The Water Supply of Glasgow: A century of Municipal Progress* (Glasgow, 1955), p. 10

<sup>82</sup> J. Bell, *op.cit.*, p. 240

<sup>83</sup> See footnote 1.

<sup>84</sup> J. Kellet, *op.cit.*; M. Falkus, *op.cit.*; P.J. Waller *Town City and Nation - England 1850-1914* (Oxford: Oxford University Press, 1983); D. Fraser *Municipal Reform and the Industrial City* (Leicester: Leicester University Press, 1982)

into the State of Large Towns and Populous districts some credence is given to Hassan's ideas.<sup>85</sup> Liverpool's two private companies through their failure to meet the demands of the consumers do exemplify the problems of an unofficial cartel - the wasteful duplication of infrastructure, the complacent attitudes to extending and modernising the system. The information on the relative market price of their shares suggests that they were more concerned with the short term investor rather than long term public benefit. There is no information available as to whether the Liverpool Corporation had a financial interest in the private water companies, as had happened in Glasgow. There are no surviving reports or minute books which could indicate any assistance from the Corporation with finance or management.

The Glasgow results however, imply that it was possible for private companies to meet market demands in some ways. The fluctuations in the revenue of the Glasgow company with the increasing competition offered first by the Cranstonhill company in the 1830s and then by the Gorbals company in the 1840s indicates that market forces were in operation in the water industry in Glasgow. Considering now the idea that private companies could not raise the large capital sums necessary for expansion, it is seen that both the Glasgow company and the Gorbals company were successful in their petitions to Parliament in the 1840s for permission to construct new schemes, in fact the Loch Lubniag scheme promoted by the Glasgow company was considerably more ambitious than the Loch Katrine scheme which the Corporation finally opted for. The raising of capital by the Glasgow and Gorbals companies was not a conspicuous problem during their lifetimes. The issue of shares was carefully controlled for the benefit of shareholders so that the dividend was not diluted too much, and although the price of the shares fluctuated, as it did for all companies, in response to market performance and competing investment opportunities, the sale of shares was never difficult for these two companies. The Cranstonhill company did have problems with the sale of shares but this was probably due to the unstable image of the company and the absence of dividends.

Hassan's hypotheses need therefore to be integrated with the particular local circumstances of the water companies when trying to arrive at an explanation for their success or failure. The Liverpool companies had a much narrower range of choices for the extension of their water systems, had they wished to apply to Parliament for permission to construct a new project and to raise the necessary capital to do so. Apart from sinking new wells within the city, the other solutions were on a massive scale, such as those suggested by the 1847 enquiry for bringing water to Liverpool from the Lake District. Glasgow had a wider range of short term solutions to the water crises of the 1840s. The Gorbals gravitation scheme for bringing water from the hills to the

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<sup>85</sup> PP 1847 XXI; PP 1844 XVII

south of Glasgow was relatively cheap and had worked well, but its achievement would be minor compared to the large schemes needed if Bateman's forecasts of population growth were accurate. Another possible solution was to extend the pumping from the Clyde. Some of the other schemes involving impounding water to the north of Glasgow were also within reach of the water companies. Thus it can be seen that the situation for Glasgow companies was much better than for the Liverpool companies. When this observation is combined with the knowledge that the Glasgow companies were more efficient in meeting the demands of their customers, the explanation for the demise of the Glasgow companies cannot be found within the Hassan theory.

Kellet and Falkus have attempted to explain the municipalisation of public services in terms of a gradual extension of the powers of the local authority as the need arose. Often this was identified by national surveys of the conditions of the urban environment, such as Chadwick's report of 1842. A more relevant question is whether the organisations operating within the urban areas were capable of taking on the additional responsibilities which Parliament had judged too important to remain in the hands of private companies. Fraser investigates the reform of the municipal corporations which was a prerequisite of the buy-out of the water companies.<sup>86</sup> The 1833 Royal Commission identified the corporation of Liverpool as worthy of praise for the way in which it managed the urban environment, but many towns were not so lucky.

The role of the public health argument in the municipalisation of the water supply in Liverpool and Glasgow was varied. In Liverpool it certainly facilitated the demise of the private water companies, and the evidence of the Medical Officer of Health (Duncan) was crucial in the success of the 1847 Bill. In Glasgow, surprisingly, the Corporation did not maximise the public health argument in its petitions for the municipalisation of the water supply. Their motivation was based on the efficiency of supply, and the integration of urban services within one administrative system. Undoubtedly they were aided in their quest by the national image of private water companies which was being articulated through other municipalisation Bills in Parliament at that time.

The municipal buy-out of the water companies must thus be seen from these perspectives. Firstly, was the individual corporation in question capable of managing the water industry more efficiently than the companies it was replacing? Secondly, how did these buy-outs fit into the wider debate on the extension of 'municipal socialism' and thirdly, was the municipal unit more suited to the provision of basic services? To fully evaluate these ideas the details of the municipalisation of Liverpool and Glasgow's

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<sup>86</sup> D. Fraser, *op.cit.*, p. 4

water supply must be investigated in more detail. Consideration must also be given to their respective successes and failures in other areas of urban management.

### 4.3 Municipalisation

#### 4.3.a Liverpool

The evidence of the failure of the private water companies in Liverpool is well documented in the 1847 enquiry, and Parliament duly passed the Bill for the Corporation to buy-out the two companies.<sup>87</sup> The new Act which had been promoted by the Corporation as ‘the fitting appendix to the 1846 Liverpool Sanitary Act’ was seen as an important milestone in the journey to an efficient and adequate water supply system for Liverpool. The Corporation had, through an Act of Parliament in 1843 obtained powers (formerly held under the Highway Commission) to obtain an independent supply of water for fire and public usage by sinking a well at Green Lane. The 1847 Act thus united all the water interests in Liverpool under the jurisdiction of one committee. With such bountiful resources at their disposal, the success of the system should have been assured, but this was not so. Liverpool’s management of a municipalised water supply was a disaster. Was it due to human incompetence on the water committee, the overriding problems of population growth, or was it the constraints of a municipal organisation? Did the committee face an insurmountable problem in the opposition of the people of Liverpool and their reluctance to part with large sums of money on a ‘luxury’ like a constant water supply system?

From March 1848 the Corporation Water Committee was upgraded from an advisory body into the decision centre for the whole water supply system. The immediate decisions taken were based upon information supplied by Thomas Hawkesley, consultant engineer to the Water Committee. He presented his estimates on the average daily production of water, showing that at 2,800,000 gallons per day, the average supply per person was only 7 gallons, inclusive of that portion which went to manufacturing and shipping.<sup>88</sup> The Health of the Towns Association had stated in 1845 that the minimum supply should be 13.5 gallons per person per day, exclusive of other demands.<sup>89</sup> Hawkesley saw that even allowing for a supply from the Green Lane well of 1,200,000 gallons per day there would still be a shortfall of some 4,000,000 gallons. He recommended that the powers gained in the 1847 Act for the Rivington Project be put into operation immediately. On a more practical level, Hawkesley initiated the amalgamation of the three separate water supply networks. Linkage pipes

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<sup>87</sup> 10 & 11 Vict c. cclxi *Liverpool Corporation Waterworks Act*

<sup>88</sup> *Water Committee Minute Book*, p. 19

<sup>89</sup> *Liverpool Health of Towns Advocate* 1845

were put in and a new management structure set up. Some of the old water company staff were kept on by the corporation and several new posts were created to aid the collection of rents. Authorisation was given at the committee meeting of 27th March to put out a tender for the supply of 2,000 tons of iron pipes so that the water system could be extended.<sup>90</sup>

In the report on the Metropolis Water Bill in 1851 Michael Scott was called in to give evidence on the supply of water in Liverpool. He was the engineer for the Bootle company and transferred to the Corporation staff after the buy-out as the managing engineer, but he resigned after only two years, dissatisfied with the corporation performance. Scott gives some interesting details about the ineffectiveness of the new Water Committee and its determination to persist with the Rivington Scheme despite the considerable public opposition. By 1848 there were two Water Committees in Liverpool - the official council one and another appointed by the ratepayers to try to negotiate on the Rivington Scheme. Liverpudlians were split into two camps, the 'pikeists' and the 'non-pikeists'. The tension created by this matter pervaded all aspects of life, and municipal candidates based their election campaigns upon the issue. Scott claimed that none of the Water Committee members had any knowledge consistent with their position on such a technically specialised committee. He had to prepare the most basic of reports for them on the principles of water supply and elementary hydraulics. There were also problems with the collection of water rents, as the Corporation had attempted to consolidate the collection of several types of rates. This put an extra strain on the poorer classes who, when faced with a single amalgamated bill, frequently defaulted on the payment.

The Rivington scheme had its opponents from the start. Objections were raised by the manufacturers of North Lancashire and the mill owners on the rivers Douglas and Roddlesworth. These cases were put during the Bill's debate but did not lead to an outright rejection - merely the introduction of compensatory supply clauses. Liverpool's requirement for water for sanitary purposes outweighed the purely profit motivated claims of the industrialists. The scheme was referred to an adjudicator, Robert Stephenson, in November 1849 in view of the decisions of the water committee over the course of action. Some of the committee members were in favour of trying to increase the supply of water obtainable from the wells by making deeper boreholes in to the sandstone rock. However, Stephenson found in favour of the Rivington scheme.<sup>91</sup> White puts the initial estimate at £450,000, but this was raised to £839,000 in 1849

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<sup>90</sup> *Report on the Metropolis Water Bill* PP 1851 XV p. 567, questions 9911 to 10162.

<sup>91</sup> Council Report of the Special Water Committee 1849 (LRO); also see R. Stephenson, *Report on the Supply of Water to Liverpool* (London: Bradbury and Evans, 1850). There is a discussion on the scheme in G.M. Binnie, *Early Victorian Water Engineers* (London: Thomas Telford, 1981)

when work on the scheme began, but the final cost was £1,345,969.<sup>92</sup> Rivington water was finally available in Liverpool in 1857 but already water shortages were being mentioned in the council chambers and proposals were being received for new water schemes.

The Rivington scheme was a major disaster. However, this only came to light when the actual quantities of water received in the town failed to meet Hawkesley's calculations. In 1864 Rawlinson, who had been involved in the water debate in the 1840s published the 'truth' on the scheme.<sup>93</sup> By this date Stephenson (the adjudicator) had left Liverpool and Shuttleworth (the Town Clerk) was dead, thus removing any element of scandal that the details could have caused had the participants still been active in Liverpool. Rawlinson showed that Hawkesley had taken two particularly wet years to calculate his average when estimating Rivington's potential supply.<sup>94</sup> Therefore when the reservoir was constructed the amount of water collected from the designated watershed was well below his expectations. Hawkesley was criticised again by the Water Committee in May 1853, when he is accused of neglecting his duties on the Rivington scheme (no doubt in favour of more profitable work elsewhere).<sup>95</sup> Apparently Shuttleworth had admitted to Rawlinson in 1847 that he had had serious doubts about the Rivington scheme, but as he was new to the post of Town Clerk, and having heard that the private water companies had plans of their own to increase water supply (which would have made the Corporation buy-out more expensive) Shuttleworth went to Parliament in support of the Rivington scheme without having made a thorough investigation of the plans.<sup>96</sup>

*Porcupine*, a weekly Liverpool political newspaper with a Liberal bias constantly brought the actions of the Water Committee into the public eye - recounting the ineffectiveness of the committee members, their inability to make decisions, the lack of accountability to the ratepayer and telling of serious problems with the water supply which were reminiscent of the old private water companies. An article on 17th November 1860 entitled *Revelations of Rivington* recites what the scheme's proposers had promised, namely a constant supply, no more costly pumping from the wells, savings to ratepayers and grand fountains in every ward.<sup>97</sup> *Porcupine* revealed that the committee's excess of expenditure over income was £20,000 p.a. on top of a crippling debt of £1,700,000. There were constant claims for compensation (some of £20,000)

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<sup>92</sup> B.D. White, *A History of the Corporation of Liverpool 1835-1914* (Liverpool: Liverpool University Press, 1951), p. 57

<sup>93</sup> Rawlinson had proposed his own scheme to bring water to Liverpool from Bala Lake in a pamphlet in 1846, reprinted in 1866 (LRO)

<sup>94</sup> G.M. Binnie, *op.cit.*, gives a technical review of Hawkesley's errors.

<sup>95</sup> *Water Committee Minute Book*, 5.5.1853 (LRO)

<sup>96</sup> This episode is narrated by P. Reeve, *Sanitation and Mortality in Liverpool 1847-1900* (Unpublished B.Phil. Thesis, Open University, 1986) p.61

<sup>97</sup> *Porcupine* Vol 1 p. 75, 17.11.1860, 'Revelations of Rivington'



for damage to property and lack of water. From 1st January water assessments were 'to be raised and on hundreds of rentals the rate will be doubled!'

Under the 1847 Act conditions were laid down concerning the profits from the water undertaking after the Corporation buy-out. Rents were to be kept as low as possible, any unforeseen profit was to be put back into the system to improve the waterworks or to pay off the debts.<sup>98</sup> Why then was the new water system unable to support itself? Porcupine hints in its usual satirical way that the committee was frittering away money on unusually high salaries for the water officials, the retention of unnecessary staff and general extravagances claimed on 'expenses'. On 20th September 1862 Porcupine refers to the recent fire at the workhouse in which several children died. The fire police had been unable to get any water from the mains and Mr. Duncan of the Water Committee told the Council that this was because the cistern for the workhouse was higher than the supplying reservoir and that the Poor Law officers had not seen fit to make alterations to it.<sup>99</sup> Porcupine, however, made the allegation that at night the water pressure was turned off in the town and directed to the docks and warehouse district to protect the valuable goods. On 29th June 1865 Porcupine launched a particularly bitter attack on the Water Committee, due to rumours that the 'pike' was not producing all the water it should:

Liverpool in all its innocence did not know how scarce water was until told: but like the poor man who was made really ill by being perpetually told he looked so, the town has at last become thirsty.<sup>100</sup>

Other Liverpool newspapers were also reporting the problems with the lack of water and the failure of the Rivington scheme. The Mercury printed an apparently serious idea for increasing the water supply - by shooting cannons at the clouds over Rivington reservoir to release the rain!<sup>101</sup>

In 1866 an Act of Parliament gave Liverpool permission in view of its water shortage to purchase part of the 7,500,000 gallons daily discharged as compensation water into the rivers Douglas and Roddlesworth.<sup>102</sup> This purchase cost the Water Committee £43,000 but it was only a temporary solution to the ever present water problem. In 1873 the Council agreed to find a new large scale source of water. Schemes were proposed, including Bala Lake, Windermere, Thirlmere and extensions to the sandstone well supply.<sup>103</sup> The water question in Liverpool in the 1870s was highly politicised. The Tories who were in control of the Council were in favour of a

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<sup>98</sup> 9 & 10 Vict. c.127, Sections 4 and 125

<sup>99</sup> *Porcupine* Vol 4 p. 193, 20.9.1862 'Fire and Water'

<sup>100</sup> *Porcupine* Vol 7 p. 139, 29.7.1865 'The Water Difficulty Solved'

<sup>101</sup> *The Liverpool Mercury* - reported in *Porcupine* 29.7.1865

<sup>102</sup> 23 Vict. c.xii *Liverpool Corporation Waterworks Act*

<sup>103</sup> These are reviewed in PP 1880 I *Enquiry on the Liverpool Waterworks Bill*.

substantial expense on a new scheme. The Liberals, who launched their attacks through 'The Liberal Review' and 'Porcupine' claimed that the people themselves did not want any more big schemes and associated rate rises. The Liberal Review on 2nd February 1878 carried an article entitled 'Water Committee Vagaries' concerning the debate over the water schemes:

indeed it would appear from their (the committee's) conduct that any scheme, which is a large one, and will cost a great deal of money, will meet their approval.<sup>104</sup>

The Review then proceeded to claim that the Water Committee has deliberately been drawing less water during the past 17 weeks from their sandstone wells which led to a dangerously high level of water and the threat of the bore holes closing up. This, the Review suggested would increase the committee's evidence that a new scheme was necessary and that the wells were finally exhausted. On 10th August the Review made a more pointed comment on the current debates between the Water Committee and the Council over the further supplies of water for the town:

Naturally a great number of persons will be enriched if gigantic works are entered upon by the corporation.<sup>105</sup>

On 14th August there was a five hour long Council debate on the water issue, resulting in a grant of £10,500 to mix the 'suddenly hard' well water with the water from Rivington Pike.<sup>106</sup> It was not until 1879 that the Council finally gave permission to draw up plans to construct a reservoir at Vyrnwy in North Wales. A Parliamentary sub-committee was formed by the Corporation to put the case for extending Liverpool's water system again. Anthony Bower was elected chairman. He was a prominent member of the Town Council (elected in 1873) and had been chairman of the executive Water Committee since 1876. Bower was a Justice of the Peace for the Borough and he derived his income from the engineering firm of George Forrester, where he was a senior partner.<sup>107</sup> The Parliamentary sub-committee seemed to have unlimited funds and no accountability to the main committee. There are no records of its expenditure and James Smith (the engineer) put through weekly claims for himself and the contractors, clerks and draughtsmen.<sup>108</sup>

Bower went to Paris in September 1879 to engage Thomas Hawkesley again, despite his failure on the Rivington scheme. Hawkesley was allowed to rent a house in

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<sup>104</sup> *Liberal Review* 2.2.1878 'Water Committee Vagaries'

<sup>105</sup> *Liberal Review* 10.8.1878 and 17.8.1878 'The Water Juggle'

<sup>106</sup> *Liberal Review* 17.8.1878 'The Water Muddle' and Council Proceedings 14.9.1878

<sup>107</sup> Perhaps the allegations made by the Liberal Review referred to Bower, as his firm would probably tender for the Vyrnwy contract.

<sup>108</sup> Water Committee - parliamentary sub-committee minute book (LRO) The committee was formed on 1.8.1878 and by the end of the first month Smith had claimed £134 9s 4d.

London for the duration of the Parliamentary enquiry.<sup>109</sup> This took place in July 1880 under a Select Committee of nine members.<sup>110</sup> The Severn Water Commissioners formed the main opposition of the Bill, claiming that if Liverpool was allowed to take a large amount of water from North Wales that their interests would be severely damaged. Their case rested on two points. Firstly, that the Severn fishing interests would be harmed if the river level dropped, and secondly, that the impoundment of water in the Vyrnwy reservoir would remove the 'freshets' which scoured the river and helped to keep it navigable. However, the investigation found that the scheme would actually be advantageous for the Commissioners as it would reduce the severity of flooding, and that the scouring of the river was done by the tidal action of the estuary below Gloucester, not the freshets.<sup>111</sup>

Having convinced the Select Committee that there were no valid objections to the scheme, the Liverpool representatives still had to prove that Liverpool needed to break the traditional restrictions placed on local authorities seeking to go outside their natural watersheds for resources. Manchester had had to do this for its Thirlmere scheme as it had no local supply of water.<sup>112</sup> Bower, Hayes Wilson and Hawkesley presented evidence of the falling off in supply from the wells in the city.<sup>113</sup> Statistics were also produced on the expected population growth in Liverpool to 1,600,000 by 1916, which would require a water supply of 48,000,000 gallons daily.<sup>114</sup> Again, as in 1847, public health arguments were used as part of the rationale for expansion. References were made to the public health of the city and the Medical Officer of Health reports were used to show a correlation between mortality and the drought of 1866. Hays Wilson gave details of the increasing pollution of the sandstone wells, which in some areas had been used as cesspools due to the deficient sewerage system.<sup>115</sup>

Comparisons were drawn with the water supply in other large towns and cities and their respective mortality rates. Liverpool, which had a supply of 25 gallons per person per day had a mortality level of 30 per 1000, whilst London, which had 32

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<sup>109</sup> *Ibid.*, 15.9.1879

<sup>110</sup> The debate started on 3.6.1880 and finished on 1.7.1880. The proposal for a second reading of the bill had taken place in February and was reported in Hansard (24.2.1880). The Liverpool MP Rathbone did not feel he had to turn up to ensure that the bill passed this stage and this attracted some criticism from the opposition that Liverpool was not really concerned about the fate of its bill.

<sup>111</sup> PP 1880 I p. 27

<sup>112</sup> The Thirlmere Act was passed in 1879. It had been suggested that Liverpool share the water with Manchester, but the completion was apparently not soon enough to relieve Liverpool's water shortage.

<sup>113</sup> PP 1880 I p. 27. The wells were deepened from time to time. Between 1850 and 1876 the Windsor well bore hole was widened to 6in and made 212 feet deeper (1854) and at Dudlow lane an additional well was sunk in 1867. This should have increased supply to 8,785,261 gallons per day, but the readings in 1876 showed a supply of 6,480,512, thus Hawkesley's estimate of a 'falling off' of 2,301,699 gallons per day.

<sup>114</sup> *Ibid.*, p. 6

<sup>115</sup> *Ibid.*, p. 23

gallons per person per day had a mortality rate of 24 per 1000.<sup>116</sup> The witnesses also showed that Liverpool needed large amounts of water in connection with her economy - to supply the ships with domestic water and to provide water for the steam boilers. The use of baths was also increasing in Liverpool.<sup>117</sup>

Parliament approved the Vyrnwy scheme and the proposed finance for it. The first pipeline was completed in 1892 and by 1905 it supplied 40,000,000 gallons per day.<sup>118</sup> The final cost was substantially more than the ratepayers or the council had ever imagined, but it proved a worthwhile investment as it still meets the majority of Liverpool's water demands today. The total capital expenditure on waterworks in Liverpool by 1902 was £5,198,611.

#### 4.3.b Glasgow

Glasgow's management of its water supply conforms much more closely to the accepted view of progress after municipalisation. The Corporation finally obtained Parliamentary permission in 1855 to buy-out the two water companies, following several attempts which failed due to opposition to the Loch Katrine scheme which the Corporation also needed permission for. Loch Katrine is located to the north of Glasgow and Bateman (engineer of the Manchester waterworks) had decided that this was the most favourable scheme.<sup>119</sup> The proposed catchment area included some of the headwater for the rivers Forth and Teith, hence the Admiralty's petition that removing so much water would affect the navigation of the rivers and destroy the Navy's safe harbour. A further cause for concern was that the water would have to pass over deposits of lead on its way to Glasgow and therefore could be damaging to the health of consumers. Stephenson and Brunel were brought in to establish that the navigation of the rivers would not be affected by the impoundment and chemists concluded that from other cases (Bolton and Inverness) that there would be no risk from the lead.<sup>120</sup> The Act appointed the Magistrates and Council of the city of Glasgow as Water Commissioners and set the rates of compensation for the interests on the rivers.<sup>121</sup> The decision to press for a buy-out of the private companies as well as initiating its own scheme had its roots as far back as March 1834, when Henry Dunlop moved this motion in council:

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<sup>116</sup> *Ibid.*, p. 28

<sup>112</sup> *Ibid.*, p. 28

<sup>118</sup> B.D. White, *op.cit.*, p. 117

<sup>119</sup> Report to Council by J.F. Bateman. *Council Minutes* 4.3.1853

<sup>120</sup> *Glasgow Herald*, 2.4.1855 p. 5 'Chemical Report on Loch Katrine Water'. *Glasgow Herald*, 9.4.1855 'The Lead Question'.

<sup>121</sup> 18 & 19 Vict c.118

That although the charges and profits of any joint stock company for supplying the public with water may be regulated in some measure by Act of Parliament, yet the public can have no security that the supply shall be either abundant or of good quality, if it be furnished exclusively by one company. That it would be for the benefit of the public that the works should belong to the Corporation and that the profits should be applied to public purposes.<sup>122</sup>

The Corporation were aware that a coalition would not be feasible and that they must have total control over such an important sanitary measure as the water supply. What they do not seem to doubt is that the water companies could extend their supply if they wanted to. This again does not fit Hassan's theory that the municipal bodies only stepped in when the need was for large scale schemes which were too expensive for the private water companies. Dr. Macquorn Rankine and Mr. Thomson suggested that:

There can be no doubt that this undertaking (Loch Katrine) would be profitable to a commercial company, as well as advantageous to the public. The annual expenditure and depreciation upon works acting by gravitation is trifling compared with that on a pumping establishment, and does not increase in proportion to the quantity of water supplied.<sup>123</sup>

There were dissenting parties within the Council in the early 1850s who still considered that the Loch Katrine scheme would be best implemented through a private company which had some supervision from the Corporation, perhaps the presence of the Lord Provost who had been on the management committee of the Glasgow Water company.<sup>124</sup>

The key issue for the Council during this period was to promote a scheme which would anticipate the growth of the city for the next few decades. Bateman calculated that they must only consider schemes that would supply 25,000,000 gallons per day and which could be extended later at little cost. Again we find major difference between the way in which Liverpool and Glasgow approached the issue of large water schemes. Although the question was more pressing for Liverpool, due to the lack of abundant local supplies, and Glasgow was relatively well endowed, Liverpool had more concern for the cost of the scheme than the long term benefits. Opposition to Rivington was fierce and unmitigated, it permeated every aspect of life in the city from the start of the search for a new supply, until well after the water was available in the city. It split the community into two. Glasgow's debut into the world of 'mega-schemes' was less fraught and altogether more logical. When on 22nd February 1855 a

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<sup>122</sup> *Council Minutes*, 8.9.1853.

<sup>123</sup> Letter to council 1.3.1852 as reported in J. Burnet, *op.cit.*

<sup>124</sup> Leeds had a joint stock water company that had a more active participation by the council who provided half of the directors.

vote was taken over Stephenson and Brunel's recommendation of the Katrine scheme, only one member voted against it.<sup>125</sup> The press had taken sides over the water issue, with the Glasgow Herald supporting Loch Katrine and the Examiner and the Gazette opposed to it, but even so the debate never gained as much space as Rivington did in the Liverpool newspapers. The Corporation almost seemed reluctant to take on the water supply for the first few years of the debate. However, when the Council did consider the matter it called upon the experts to give their views. Dr. Smith who reported on the chemical analysis of Loch Katrine water also added:

How much the value is in a sanitary point of view and as affecting the habits of the people, it is not possible to calculate, as the gain in these respects must have much more than a monetary value.<sup>126</sup>

Bateman was instructed by the Council to investigate several water schemes for Glasgow. After calculating the rainfall for the various districts and estimating the necessary works, he produced the following costings, which included a sum for the re-organisation of the pipe network in the city. This was in a state of disorder as the three companies had during their time laid the pipes in a haphazard way, with no regard for building a coherent network. The Gorbals works were to be retained within the system, as they supplied 17,000,000 per day at a cost per million gallons of £22,800. The Loch Katrine waterworks were to supply 20,000,000 gallons per day at a cost per million gallons of £27,500.<sup>127</sup>

The Corporation of Glasgow was decidedly more organised than that of Liverpool in the actual process of getting the Bill through Parliament, and in the business of negotiating with the private companies. Arrangements with local landowners for compensation for land around Loch Katrine were made before the Bill went to Parliament and the finances of the water companies were investigated to ascertain the lowest rates the Corporation could charge and still break even, and attempts were made to settle the dispute with the Admiralty in advance.<sup>128</sup> The Bill received Royal Assent on 2nd July 1855 following a relatively easy passage through the Houses.

The buy-out of the water companies cost the Corporation a considerable sum. The negotiations with the Gorbals company were swift and the final arrangement was 6% on their capital stock of £180,000.<sup>129</sup> The Glasgow water company held out for longer and the matter went to arbitration, as allowed for in the company's Act of Incorporation. The price agreed in 1856 was 4.5% on the ordinary stock of £303,700

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<sup>125</sup> *Council Minutes*, 22.2.1855

<sup>126</sup> *Council Minutes*, 8.9.1853

<sup>127</sup> Letter from Bateman to Lord Provost 19.9.1853.

<sup>128</sup> *The Glasgow Herald*, 23.4.1855 - reports that the Admiralty have accepted £7,000 and withdrawn their opposition to the bill.

<sup>129</sup> *Water Trust Minute Book*, 26.7.1855, p. 14

and 6% on the preference stock of £41,680.<sup>130</sup> Most of the shareholders subsequently transferred their investment to the Corporation waterworks which was funded by annuity debentures. These annuities amounted to £525,380, valued at 4% representing a capital sum of £674,180. There was also a £76,000 mortgage debt. The borrowing powers of the new commissioners was fixed at £700,000.<sup>131</sup> This had to cover not only the cost of acquiring the land and the expense of the Loch Katrine works but also buying out the private companies. Subsequent Acts were gained to extend the borrowing powers and to undertake additional works for Loch Katrine.<sup>132</sup> Stevenson suggests that when the works were handed over to the Corporation they were dismantled as quickly as possible. This contrasts with the situation in Liverpool where immediately after the acquisition Hawkesley did a 'patch' job on the old system. This could be taken to imply that the Glasgow pipes were in a worse state than in Liverpool, or that in Liverpool the need for water was so urgent that there was not time to lay new pipes. Liverpool was complacent and to a certain extent naive over the management of their waterworks. Glasgow on the other hand, was well prepared to expand and modernise the system.

The 1855 Act had vested the management of the waterworks in the 'Water Commissioners' and from this body a Water Committee was elected to control the daily affairs. A councillor was selected from each of the 16 wards of the city, thus ensuring equal representation for all districts.<sup>133</sup> This contrasts with the private periods of supply when the case for supply to specific parts of the city had to be presented by the prospective water consumer, and the merits of connecting him were viewed in purely financial ways. Now the method of representation should have removed such imbalances in prioritising the supply. Two sub-committees were formed immediately to deal with finances and the works, the conveners being members of both committees, thus ensuring rapid dissemination of knowledge throughout the whole water concern.<sup>134</sup> A deputation was also formed to ascertain from other large towns who the most suitable engineers would be to submit plans for the new works, but almost immediately negotiations started with Bateman and there was no real consideration of other engineers. This impatient move caused some animosity on the committee as Bateman was not a unanimous choice. Local engineers would have been cheaper, but the prestige value associated with having a 'Bateman' scheme won the day. He was appointed on a salary of 4.5% of the cost of the project, which he estimated at

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<sup>130</sup> *Ibid.*, p. 152 (29.12.1856)

<sup>131</sup> J. Bell, *op.cit.*, p. 257

<sup>132</sup> 22 & 23 Vict. c. 9; 23 & 24 Vict. c.33; 28 & 29 Vict. c.64; 29 & 30 Vict. c.328; 36 & 37 Vict. c.36; D.M. Stevenson, *Municipal Glasgow* (Glasgow: Corporation of Glasgow, 1914) This gives a summary of later work on Loch Katrine.

<sup>133</sup> *Water Trust Minute Book*, 26.7.1855, vol.1, p. 1

<sup>134</sup> *Ibid.*, 1.8.1855

£540,000. His salary was to be paid in instalments every six months to total of £24,300.<sup>135</sup>

The works of the two companies were taken over on the 15 May 1856 and the water committees spent the 10 months prior to this date ensuring that they were fully prepared for the event. Handbills were sent to all the landlords and factors informing them that they would be liable for the water rent on their properties in the ensuing year, thus placing the onus on them to recover the charge from their tenants. Most of the staff of the old companies were kept on and arrangements were made with the banks for credit facilities and for the transfer of mortgages from the companies to the Corporation.<sup>136</sup> The finance sub-committee also started negotiations with the Barony and Parochial Boards and the Glasgow Police Board to consider the interdependence between themselves.<sup>137</sup> A structure for meetings was decided early on, with all the sub-committees meeting monthly and a sub-committee on pay-bills meeting fortnightly, thus removing the necessary but time consuming task of authorisation of invoices from the main committee. The Water Commissioners as the executive body met irregularly during the first year, but developed a pattern of monthly meetings when mortgages were approved and the progress of the water committee reviewed.

Investment in the water trust was enthusiastic. Many of the shareholders in the companies simply transferred their loans to the Corporation. The capital for the Loch Katrine scheme was raised steadily throughout the first two years, thus enabling an early start to the contractors' work. Most of the contracts were successfully completed, with only one being taken over by the Corporation workforce because the contractor ran out of cash.<sup>138</sup>

The Water Committee during the period 1856 to 14th October 1859 (when the Loch Katrine works were opened by Queen Victoria) performed a juggling act - simultaneously running the old Clyde and Gorbals works and also constructing a monumental new water system. The success of this was due to the efficiency with which the committee organised and delegated the respective routines of the water supply business. Although the 'leg work' was done by full time employees, and the committee members were also engaged in other council affairs, they still found time through the system of well appointed sub-committees to set the water rates, hear complaints and supervise the progression of the new works.<sup>139</sup> The communications of the organisation were the key to the success of the system. It is possible to trace the decision making process through the respective minute books of the committees. When

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<sup>135</sup> *Ibid.*, 30.10.1855

<sup>136</sup> *Finance Committee Minute Book*, 19.6.1856, p. 14

<sup>137</sup> *Ibid.*, 8.7.1856, p.1 8

<sup>138</sup> *Water Trust Minute Book*, 28.9.1857, p. 232

<sup>139</sup> *Ibid.*, p. 246. These were frequently re-arranged to ensure maximum benefit and the use of manpower.



the Works Committee notes that a contract seems to be exceeding its budget, the Finance Committee is informed and the information used to get permission from the Commissioners to advertise for more loans, thereby ensuring that the capital of the trust increased in proportion to the works expenditure so that interest payments were only incurred when necessary.

Annual reports from the Water Committee to the commissioners contained similar information to that contained in the old companies' reports.<sup>140</sup> The excess of income over expenditure is given, but this information then goes into the equation for the next rate level, whereas the private companies used it to declare the dividends. The report for the year to May 1857 shows that considerable improvements had been made to the old works, and that the supply of water had increased to 16,169,000 gallons per day.<sup>141</sup> The report admits that some customers still do not get an adequate supply, and therefore concludes that water must be escaping from the system in some places. The water rates for supply remained the same during the period of Loch Katrine's construction. The 1858 showed an increase in the amount of water from the old water works - perhaps suggesting that the private companies could have increased supply if they had wanted to. The amount of water supplied in 1858 was 17,031,000 gallons per day. This estimate gives a personal supply of 40 gallons, inclusive of that which was supplied to industry. In November 1858 the issue of a further Parliamentary Bill to extend the borrowing powers was gained, but Bateman expressed his doubts that the project would be finished on time.

This is the only point during the entire venture when the Water Committee do not seem to have complete control over the situation. The management of the old and new works was kept entirely separate and the rating system accommodated the cost of the routine water supply, not the construction costs for Loch Katrine.<sup>142</sup> At this point the option of using the rates to pay for Loch Katrine was considered. The increase in costs was not due to mis-management but because of the geological structure of the rocks which had to be cut for the water to reach Glasgow - it was much more resistant than Bateman had anticipated. Glasgow did have some concern for the cost of the scheme, in the shape of James Taylor, who was a member of the Water Committee but who opposed the 1859 Bill for the alteration of the constitution of the Commissioners from his position as a ratepayer. Taylor provided the contemporary debate which does not seem to have made it to the newspapers in Glasgow. He was concerned that the new Bill did not fix a maximum rate for water supply in the north of the city (where he lived). The south side of the Clyde was still under the rates constraints imposed by the Gorbals company Act of 1855 which limited the domestic rate to 1s. in the £. As the

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<sup>140</sup> *Ibid.*, 17.7.1856, p. 110; 16.7.1857, p. 202; 15.7.1858, p. 332

<sup>141</sup> *Ibid.*, p. 205

<sup>142</sup> See for example the annual calculations made 21.7.1859, p. 428

public rate in Glasgow could not exceed 1d. in the £ any additional income would, as Taylor saw it, have to come from the inhabitants of the northern part of the city. He feared this would lead to an exodus to the south of the city, and to areas outside the limits of compulsory supply. He also accused Bateman of mis-management and of exceeding the budget (set at £575,000) by £225,000.<sup>143</sup>

The Loch Katrine scheme was undoubtedly a success and there were comparatively few opponents to it. The water was finally available in the city in 1860, and in 1861 (the first complete year of supply) the average personal supply was 34.28 gallons and for trade it was 5.82 gallons.<sup>144</sup>

Unlike Liverpool's major water schemes, Loch Katrine needed few further extensions or improvements. This one large project sufficed and consequently the following 50 years of water supply history were relatively quiet and peaceful. The expenditure on Loch Katrine by 1880 was £1,454,000 - the increase being spent on two additional mains to the city and the extension of the pipe network within the city. In 1882 the total daily quantity of water supplied to the city was 38,000,000 gallons (4,000,000 of which were still being supplied by the Gorbals works). With a population of 762,000 the personal daily allowance was 36.65 gallons and the trade allowance per person was 14.25, thus showing a total supply per person of 51 gallons per day - well above Bateman's prediction of 36.5 gallons per person per day.<sup>145</sup>

In the 1880's the quantity supplied to dwellings actually decreased, reflecting the improvements in the pipe system and the measures taken within properties to prevent the waste of water. The revenue, however, continued to increase, and the increasing trade revenue went towards defraying the costs of duplicating part of the Loch Katrine system which was done under the Acts of 1885 and 1892, making the total capital expenditure on the water system in the city in the nineteenth century £3,446,000.<sup>146</sup>

#### 4.3.c Conclusions on Municipal Waterworks

An assessment needs to be made in two ways of the municipal supply of water for Liverpool and Glasgow. Was it an improvement on the private companies and if so, why? Secondly, how does it fit into the wider debate on municipal socialism and the effects of politics on economic planning?

The Corporation of Liverpool had a much harder task than their contemporaries in Glasgow. They inherited a more antiquated system from the old water companies, yet paid out a large sum for 'goodwill' in the purchase price. The need for a new water

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<sup>143</sup> *Water Trust Minute Book*, 15.12.1859, p. 558

<sup>144</sup> J. Burnet, *op.cit.*, p. 133

<sup>145</sup> *Ibid.*, p. 251

<sup>146</sup> *Ibid.*, p. 260

system was more pressing than in Glasgow and the political mood of the Corporation was against large investment. Waller suggests that the general level of competence of the staff of municipal corporations in the nineteenth century was low.<sup>147</sup> The evidence provided by Liverpool's Water Committee would seem to substantiate this view. There were several charges of incompetence and the financial control of the committee was weak. Glasgow's Water Committee took over a much 'fitter' water system and the solution to water shortages, in the form of Loch Katrine was cheaper than the combined Liverpool schemes of Rivington and Vyrnwy. Maybe the Corporation had a more tolerant relationship with its Water Committee, or the water issue was not as politicised as in Liverpool. There is little surviving information for Liverpool on the cost of the waterworks to the individual consumer. Useful data on water rates only becomes available from the 1880's, by which time the question of investing in Vyrnwy has already been decided, and it ceases to be a political issue.

Hassan suggested that a municipalised supply would remove some of the inefficiencies and unnecessary duplication of services, but he fails to consider the negative costs of a politicised decision making system. Another aspect to investigate is whether the municipal area was just as inappropriate as a unit of supply as the smaller private companies had been. The investment in infrastructure for the water industry, coupled with the fact that schemes the size of Vyrnwy would be more efficiently used if they supplied more than one urban area, leads one to the conclusion that for economic reasons if not political ones, nationalisation of the water industry would be the most appropriate unit of supply. This was identified in 1907 by John Burns:

while his American comrade is still shouting for Municipal ownership, he (the British municipaliser) is today, in his latest frame of mind looking to 'municipalisation by provinces'. That is for gas, water, tramway and electricity he now wants national government, appropriation, ownership and operation. He has dropped municipalisation and comes out for what he had all the time had in the back of his thoughts -'socialism'.<sup>148</sup>

## 4.4 Belfast

### 4.4.a The Spring Water Commissioners

Throughout the nineteenth century the water supply of Belfast remained in the hands of non-profit concerns. The start of any organised supply in the town can be

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<sup>147</sup> P.J. Waller *Democracy and Sectarianism* (Liverpool: Liverpool University Press, 1981) p. 288

<sup>148</sup> J. Burns in National Civic Federation, *Municipal and Private Ownership of Public Utilities* 1907, I, p. 422

identified in 1795. The Belfast Charitable Society was formed in 1774 by an Act of Parliament. Its aim was the relief of the poor within the town and many of the leading merchants took part in its activities. In the seventeenth century water had been distributed through wooden pipes, but the contamination of the main source of supply - the river Lagan - was a contentious issue.<sup>149</sup> There were some attempts to initiate a water business in the eighteenth century, notably 'pipewater' Johnston but like the early attempts in Liverpool they were unsuccessful, and the state of supply deteriorated as the population of the town increased. Water from the Cromac Spring was brought into the town in carts for sale because the pipe water was unfit for drinking.

It was in this unsatisfactory situation that the Poorhouse authorities - the Belfast Charitable Society - entered into the water industry. In July 1795 the committee invited James Gordon of Edinburgh to come to Belfast to advise on improving the water supply, but his report was vague and inconclusive. On the 22nd of July 1795 seven men were elected as the Spring Water Commissioners.<sup>150</sup> With the aid of 12 pipe water applotters they were to make rent assessments annually and to set the water rates. The Commissioners were elected by the people of the Parish.<sup>151</sup> The Marquis of Donegal (the major landowner in Belfast) gave a lease to the Commissioners for 21 years to take water from springs on his estate outside the town boundary. The SWC's realised that the service must be given a more secure foundation, and they therefore obtained the first Act of Parliament in 1800.<sup>152</sup> This compelled every owner or occupier of a dwelling house in the town who wished to have the benefit of piped water to pay the Charitable Society via the Water Commissioners an annual rent, proportional to the value of the property. The initial attempts at improving the supply were partially successful, and the town was supplied from a number of sources, Fountainville on the Lisburn Road, Munday's well near Sandy Row and the Bellow's springs near Wilmont Terrace. In 1809 work was begun on Lyster's dam to tap springs at Malone and bring the water to Belfast via Stranmillis. The project was successful despite the opposition of local landowners. This expansion of the works, which was necessary due to the growth of the town, stretched the resources of the SWC's and the whole water undertaking was nearly handed over to the Police Corporation (a committee of 21 citizens had been formed under the 1800 Act). However, in 1817 the society opted to obtain further powers to get a new source of supply.

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<sup>149</sup> *Report on the Sanitary State of Belfast* (Belfast: Henderson, 1848), p. 11. This Report was commissioned by the town council and led to the formation of the Belfast Sanitary Committee.

<sup>150</sup> *Belfast and City Water Commissioners, Sketch of the Rise and Progress of the Water Supply to Belfast* (Belfast: Baird, 1895), p. 43

<sup>151</sup> J. Loudan, *In Search of Water* (Belfast: Mullan, 1940) p. 33

<sup>152</sup> This was passed by the Irish Parliament immediately before the Act of Union for Great Britain and Ireland.

This procedure of application to Parliament continued throughout the first half of the nineteenth century, and the monopoly of the SWC's was threatened several times, particularly by the Marquis himself, who saw the water industry as a way of replenishing his dwindling capital stocks. His Bill in 1839 raised the debate on whether the Charitable Society with all its other interests could efficiently supply water to the town or whether a joint stock company with no divided loyalties would be more appropriate. After a three day debate the Parliamentary committee found in favour of the Charitable Society, but this decision did not halt the calls for change from within Belfast. A petition against the formation of a joint stock company had collected 1800 signatures, but there was also dissatisfaction with the SWC's.

The records for the SWC's survive from 1807. The committee book gives the minutes for the meetings which seem to have been called as business required them during the first few years. There was an advanced system of delegation of duties within the committee, with separate responsibilities for credit control and for the supervision of the search for new sources of supply.<sup>153</sup> There are no details of the staff of the Water Commissioners, but it can be concluded from reading the minutes that apart from the requisite engineer there was a team of rate collectors and some clerical staff. The arrangement must have been very similar to that for the private companies operating in Glasgow and Liverpool at the same time.

During the periods from 1807 to 1814 the minute books gives precise details of where in the town the pipes were laid, and the negotiations with the Police Committee for the paving of the streets after pipe laying. There are also reports of supply cut-offs due to non-payment of rates or damage to cisterns.<sup>154</sup> In 1813 a new reservoir was built on the Antrim Road and attempts were made to replace some of the wooden pipes with iron ones. However, finance was the constraining factor in the improvement of the water supply system. The SWC's had initially taken a loan from their parent body, the Belfast Charitable Society, but for any major expansion or renewal of the system to take place, the revenue had to be increased considerably. An analysis of the statement of income and expenditure for 1814 shows that the turnover of the water commissioners was very low.<sup>155</sup> In 1819 the situation worsened and the committee had to resort to signing over some of the arrears in the rates to their creditors when their loans were called in.<sup>156</sup> The SWC's however had no intention of letting their hard work fall into the hands of a private company:

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<sup>153</sup> *Spring Water Committee Book*, 17.1.1807

<sup>154</sup> *Ibid.*, 2.12.1809

<sup>155</sup> *Ibid.*, 14.4.1814. There was a surplus of £60 15s 5d for the year, on a revenue of £2145 18s 11d. Their accounting methods include in this sum a withdrawal from the savings at the bank of £874 13s 8d - without this there would have been a net deficit for the year.

<sup>156</sup> *Ibid.*, 12.12 1819

as it is our opinion that under any modification, such a company must necessarily be in opposition to the growing manufacturing prosperity of the town; and no sufficient addition to the present supply can be introduced by the agency now in operation without any interference of any party seeking to derive *private* profit therefrom.<sup>157</sup>

Despite the concerted efforts of the SWC's to prevent the take over of the water supply in the town, the Belfast Water Act was passed in 1840, and on the 6th of July the works were transferred to the new body - the Belfast Water Commissioners.

#### 4.4.b The Belfast Water Commissioners

The Belfast Water Commissioners were a unique institution in the United Kingdom. Like the SWC's their motivation was not profit. The 'Board' as it was known, was formed because it was felt that the water interest should be completely divorced from the Charitable Society, as the divided concerns of this body had been partly the reason for the downfall of the SWC's. The BWC's were granted a larger capital base of £66,000 and a greater power to assess the inhabitants for rates. The system of representation for the town was fairer, with representatives elected for each ward, making a committee of ten members. The first Commissioners were paid 10 shillings for each meeting they attended, up to a maximum of £16 a year. The financing of the new venture was through mortgages and debentures - with requests for subscriptions placed in the Belfast newspapers.<sup>158</sup> Sums ranging from £100 to £25,000 were requested, with periods of repayment between 2 and 5 years. The early minute books of the BWC's are missing but contemporary views of the water supply give some information on the successes and failures of the new organisation. The report on the Sanitary State of Belfast estimates the number of houses which received water at 10,000, of which over 7,000 were supplied from public fountains.<sup>159</sup> The report concludes that approximately 50,000 people were reliant on 24 fountains and a few private wells for their water supply. There were some improvements in the 1840s with new reservoirs being made on the Antrim Road and a supply reservoir at Carr's Glen. There were several disputes during this period concerning the rights of the bleachworks situated further up the river, and the interests of the millowners who had premises on the lower parts of the river. The major case - 'The Water Commissioners vs. Robert Howie' was tried at the spring assizes in 1851. Further improvements were made to the system of supply by creating a reservoir at Oldpark to supply water under pressure for the first time through a new network of cast iron distributing pipes.

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<sup>157</sup> *Spring Water Commissioners Minute Book (1838-1840)*, 8.7.1839

<sup>158</sup> *Belfast Water Commissioners Board Minute Book*, 22.9.1840

<sup>159</sup> *Ibid.*, p. 11

Bateman, the engineer for Glasgow's Loch Katrine water works, was also involved in the quest for a new supply for Belfast. He began a survey in 1851 on the relative merits of locations around Belfast, and presented his report in 1856 in which he found that the Woodburn would provide the cheapest and greatest source of water.<sup>160</sup> He used as his starting point the rapid growth of population, estimating from the earlier censuses that Belfast would have a population of 150,000 by 1861. He allowed for a daily personal water supply of 20 gallons, and therefore concluded that the town would need a total of 2,000,000 gallons per day. The current supply in the early 1850s was only 1,044,000 gallons, even with the improvements made to the Malone supply, thus leaving a shortfall of 956,000 gallons per day. It must be remembered that although this seemed an absurdly large amount of water to the inhabitants of Belfast, at the same time in Glasgow plans were being made to supply the city with over 50,000,000 gallons when completed. Following Bateman's report which recommended that the final scheme should be capable of supplying 6,000,000 gallons per day, the BWC's took no action for 10 years. The committee minutes for this period record petty dealings with landowners and give little attention to the predictable water shortage. This finally arrived in 1865, a year of low rainfall which aggravated the problem of increased consumer demand.

The Bill to extend the waterworks had finally been produced and it came before a Parliamentary Committee on 5th May 1865. There were several opponents to the Bill, notably John Rea, the Belfast solicitor who had been a member of the Water Board. He claimed that 7,000 households were without water and that the actions of the Water Committee were politically motivated, as the board was entirely Tory.

From 1865 the Board entered into a new period of activity. Consultations were made with the Town Council and the Harbour Commissioner to compare the administration of the town's services and on 5th March a permanent water engineer was appointed for the waterworks. In 1867 there was another water crisis due to low rainfall, but this time the criticism of the Board was muted as they were seen to be pressing on with the Woodburn scheme as fast as they could. It was finished in 1873 but when the water was available in the town it was realised that Bateman had made an error similar to that made by Hawkesley on the Liverpool waterworks. He had overestimated the rainfall of the catchment area and therefore the daily output was on average only half of what he had predicted. Thus in December 1873, the Works Committee had to announce that the continuous supply to dwellings would be reduced to a few hours per day so that the requirements of trade could still be met. This is an important point which needs to be highlighted. The clear ideology behind the decision is not to threaten trade. This conflicts with the arguments which had been made for the

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<sup>160</sup> J. Bateman, *Report on the Supply of Water to the Town of Belfast* (Manchester: Cave, 1856)

extension of supply which had been primarily motivated by public health concerns - the use of water to reduce disease in the domestic environment and the transfer of water sources away from the polluted rivers to a rural reservoir system. This suggests that the Water Commissioners were aware that a public health argument rather than a commercial one would be more effective in obtaining the Parliamentary legislation necessary to finance a new waterworks.

In 1874 another Act was passed to construct three more service reservoirs at Woodburn and in 1879 another two were added at Loughmore and Copeland. An Act in the same year permitted the construction of a high level tank at Ballygahagan so that the higher districts of the town could be supplied by gravitation. By 1881 the population of Belfast had reached 208,122 and further supplies were needed. In 1884 an Act gave permission to take water from the Stoneyford area, about ten miles to the south west of the town. Two reservoirs were constructed there and another Act in 1889 added another reservoir at Leathemstown. This Act also altered the title of the Board to the Belfast and District Water Commissioners, thus reflecting the additional service area they had acquired outside the city boundary.<sup>161</sup>

The Stoneyford water was available in the city from 1890 and did much to relieve the problems of the Board. The daily consumption had risen to 9,500,000 gallons, on average 35 gallons per person inclusive of 8 gallons for trade purposes. This seems a relatively high amount, but not all this allocation of water would have reached the consumer. Belfast had significant problems with wastage due to poor quality pipe fittings and materials. There were contemporary debates in Belfast over the question of whether the Board had acted correctly in making numerous small scale improvements in the water system instead of attempting one large scheme on the scale of Loch Katrine. It was suggested that this might have saved money and prevented some of the water shortages that had occurred since the Board's formation in 1840. Generally, the actions of the Board were viewed with compassion by the consumers. There were no charges of mis-management or wastage of funds. The only major scare over the water supply occurred in 1898 when a typhoid epidemic raised the annual death toll from the disease from its usual level (1.5 per 1000) to 6.4 per 1000. The Public Health Department of the Corporation invited two civil engineers, Conway Scott and J.C. Bretlan to make an investigation and they inaccurately came to the conclusion that the Stoneyford reservoir was the source of the outbreak. This was subsequently disproved by a Local Government Board Commission enquiry which showed that the cause was contaminated shellfish from the sewage-polluted waters of the Belfast Lough.

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<sup>161</sup> Queen Victoria had granted Belfast a charter in 1888 making it a city.



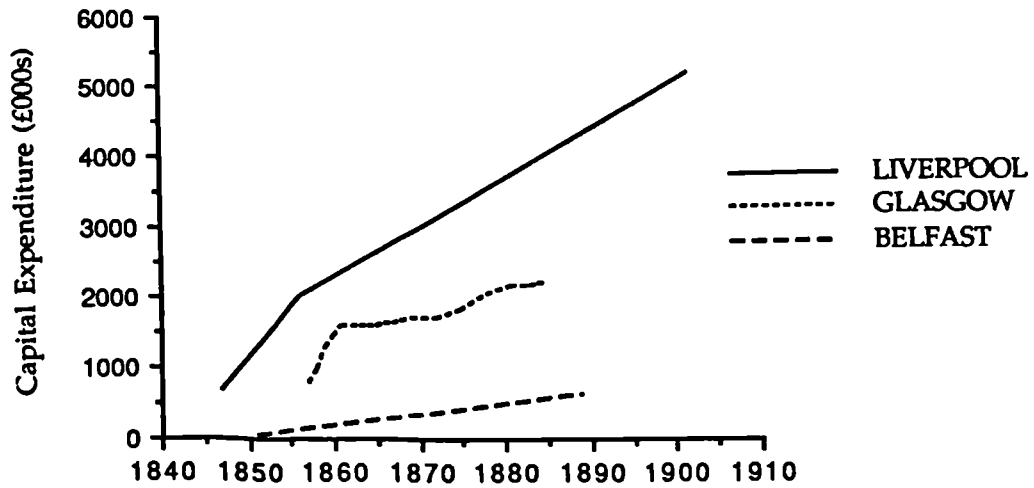
The final part of Belfast's water system was initiated in 1893 when an Act was passed for the creation of a large reservoir and works in the Mourne Mountains. This was achieved at a time when the Corporation had once again tried to take the Water Board into its jurisdiction. However, by now the board was firmly established and enjoyed an independent status. The 'Silent Valley' project ran into serious difficulties with the geological nature of the site but the first phase was completed in 1901 and the reservoir was finished in 1933.

#### 4.5 Conclusions

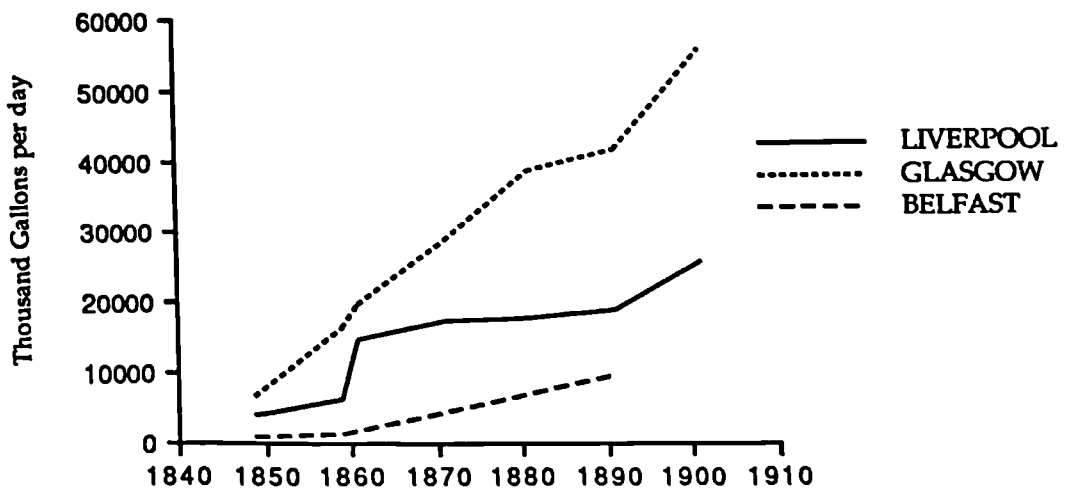
Using the information presented for Liverpool, Belfast and Glasgow it is now possible to evaluate Hassan's hypothesis that the municipalisation of the water industry occurred because the private companies were unable to raise the large capital sums required for major water investment. A distinction must be made between those companies which were incapable of raising the capital, and those which were prevented from doing so by the limits imposed by Parliament in the Acts concerning borrowing powers. Private water company requests for extensions of their capital limits came at a time when national opinion was moving towards the centralisation and unification of public health services. The link between the two issues is not explicit in the Parliamentary enquiries, but this suggestion was frequently made.

Belfast is the most logical starting point for an economic assessment of the water industry. It is clear that the relatively small capital base of the Spring Water Commissioners constrained the expansion of the supply. As the body was non-profit orientated the explanations for failure lie either with the management structure or the level of investment. The improvements which occurred after the take over by the Belfast Water Commissioners in 1840 were effected only through increasing the level of capital. By comparing the private phases of Liverpool and Glasgow's water histories, the conclusions suggest that the traditional hypothesis does not incorporate all the permutations in the experiences of the water industry. In Glasgow the competition between the water companies resulted in the 'survival of the fittest'. Had the private supply method been allowed to continue, the Gorbals company may well have proceeded to take over the Glasgow water company. Glasgow's experience gives no indication that private water companies were unable to undertake large water schemes. In fact the Glasgow water company gained permission and arranged finance for a scheme to bring water from Loch Lubnaig well before municipalising the water supply was considered. Liverpool, however, shows that by creating a 'cartel' the companies only benefit in the short-run, as the momentum for expansion declines when the market becomes supplier-led.

*Figure 4.6 Capital Expenditure on Water Systems - Liverpool, Belfast and Glasgow 1837-1902*



*Figure 4.7 Average Daily Water Consumption - Liverpool, Belfast and Glasgow 1847-1902*



Source: Water Committee Minutes for Liverpool, Belfast and Glasgow

Municipalisation of the water supply in Liverpool does not substantiate the idea that removing the profit motivation necessarily improves the service. The Corporation Water Committee was ineffective in the management of the supply and had it not had the 'authority' of an elected organisation it would not have survived. Hassan's hypothesis therefore provides some useful ideas on the supply of water in the nineteenth century urban environment, but by focussing on the data for only one city (Manchester) he has no way of checking the universality of his conclusions. This study has shown that water supply can be well managed by both private and municipal systems, and that profit motivation does not automatically mean an inferior system. Often the survival instincts of competition are needed to ensure an efficient service to the consumer, but this view is tempered with the knowledge that a free market is not compatible with the provision of a 'public' service.

Water was 'politicised' as expected in Liverpool, mainly through the use of the 'economy' argument by local ratepayers, but sheer need for greater quantities of water overcame local opposition. In Belfast, the control of the water supply by the Charitable Society for its formative years to some extent protected its development from the economic limitations which John Bates imposed on all other areas of urban government.

The issue of water quality in the three cities is articulated in a very different way from London and the large inland conurbations. Certainly, before municipalisation there is substantial pollution of well sources in Liverpool and Glasgow, and of river sources in Belfast. Part of the campaign for public control of water supply in Liverpool was based on the 'scientific' evidence of the Medical Officer of Health (Duncan) who correlated disease with dirty water supplies. However, when the new long distance water sources are tapped, apart from the preliminary analysis of the water properties (to determine degree of hardness, organic deposits, etc) there is little public concern. This is not to say that the arrival of unpolluted water finally eradicated water-borne diseases within these cities, but the issue changes to the contamination of initially pure sources when it reaches the domestic environment. Any attempt to understand this must consider the timing of the introduction of a constant water supply system, which would remove the need to families to store water in potentially dirty vessels.

However, water analysis was an ongoing event in all three cities, even if it did not excite the public interest to the same degree that it did in London. In Belfast it is interesting to note that it was the Medical Superintendent Officer of Health who requested the routine analysis from an expert at the University College, Dublin, rather than the management of the Belfast Water Commissioners, who were responsible for all other water matters. The connection between water purity and health was thus formalised in the reporting system to the Corporation Health Committee.

The quantity of water supplied will also have implications for the provision of a water-carriage system for sewerage removal, and for the introduction of public baths and wash-houses. It is to be expected therefore that chapter five will show that Liverpool and Belfast (with their respective problems in obtaining sufficient water) were relatively late in installing sewerage systems and, more importantly, transferring from a dry conservancy system for excrement removal to water closets. Glasgow, with its unlimited supply of water after the opening of Loch Katrine in 1860 should be evident as a leader in the introduction of sewerage systems. It is important to see the water and sewerage systems as an integrated pair. The provision of one of these on its own would not be sufficient to reduce mortality or to substantially improve the cleanliness of the urban and domestic environments.<sup>162</sup>

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<sup>162</sup> This has been shown by J-P. Goubert, *The Conquest of Water: the Advent of Health in the Industrial Age* (Oxford, Polity Press, 1989)

## Chapter Five

### Sewerage Systems and Refuse Removal

I found the whole court inundated with fluid filth which had oozed through the walls from two adjoining ashpits or cess-pools, and which had no means of escape in consequence of the court being below the level of the street, and having no drain. An intelligent Irishman who lived there told me that it was in vain to attempt to keep the court clean... the stench at night he said was enough to "rise the roof off his skull as he lay in bed" and the court was never free from disease.<sup>1</sup>

#### 5.1 Advances in Sewerage Systems in the Nineteenth Century

Sewerage systems have been overlooked by most historians of nineteenth century local government as things that necessarily followed on from the introduction of a comprehensive water system. However, the link which we see might not have been so obvious to the urban inhabitants, and it must therefore not be taken for granted. In some cities, the decision to install a sewerage system may not have been made until the waterworks were running, while in other places, if capital was not a constraining factor, the two systems may have been planned and installed at the same time. What, then, is this study of sewerage systems in Liverpool, Belfast and Glasgow likely to show?

Given the rapid rate of growth of these urban environments, it would be expected that there would be an awareness of the need for a sewerage system at an early point in the century, and that there would be sufficient capital available to afford the installation costs. The coastal locations of the three cities should make the problem of sewerage disposal somewhat easier than for inland towns, and thus these case studies cannot be seen as representative of the experience of all urban centres in the nineteenth century. The connection between lack of sewerage systems and high mortality rates was established at an early stage, as evidenced by the testimony of Dr. Duncan, which has been quoted at the start of this chapter. The expected sanitary effects of sewerage systems would, therefore, have been a motivating argument for their introduction. Chapter three presented mortality data for the three cities, and correlations between movements in the rates and the introduction of sewerage systems will be made at the end of the thesis.

As with the introduction of waterworks, it would be expected that the large and rapidly expanding cities such as Glasgow and Liverpool (which would have property of a greater rateable value to raise the capital from) would be in the forefront of the trend. As discussed in the previous chapter on water supply, it is difficult to make

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<sup>1</sup> W.H. Duncan, *Report on the Sanitary State of Liverpool*, evidence to the Inquiry into the Sanitary Condition of the Labouring Population PP 1842 (HL)XXVII p.282

assumptions about the financial positions of nineteenth century towns before the introduction of standardised annual reports in 1870-71. However, some judgement can be made based on the nature of the corporation's activities, and the size of the corporation estate.

Sewerage and refuse removal also impinged upon financial rights. It had been a source of income for many years for the working classes, and thus to introduce a system where the municipal authority collected it and 'owned' it was as much a trespass on the private property of the individual, as it was to limit the uses of a dwelling. It was seen as unwarranted interference in some areas, but because of the heavy sanitary overtones, the system was established 'for the public good'.

There have been some studies of the development of sewerage systems in Britain<sup>2</sup> but there was no research which complemented that of Hassan on the water supply, until Wilson's thesis. However that focussed on the domestic sanitary devices chosen rather than on the underground sewerage system.<sup>3</sup> what is still needed is a thorough analysis of all large towns and cities in Britain during this period to assess how sewerage systems were chosen and implemented. A possible reason for this lack of research interest is perhaps because sewerage is only an urban service, with no opportunity for municipal trading as with water supply. However, when the Chadwyck Healey Index to Parliamentary Papers is scrutinised it would seem that the ramifications of the sewerage issue extended into the domains of public health and river pollution.<sup>4</sup>

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<sup>2</sup> Two international studies are: J.A. Tarr, 'Sewerage and the Development of the Networked City in the United States' and G. Knaebel, 'Historical Origins and the Development of a Sewerage System in a German City: Bielefeld 1850-1904' both in J.A. Tarr and G. Dupuy (eds) *Technology and the Rise of the Networked City in Europe and America* (Philadelphia: Temple University Press, 1988)

<sup>3</sup> A. Wilson, *Technology and Municipal Decision Making: Sanitary Systems in Manchester 1868 - 1910* (Unpublished Ph.D. Thesis, Manchester University, 1990)

<sup>4</sup> **Sewerage - Reports of Committees**

Sel. Cttee. on Powers of Coms. of Sewers in Metropolis Rep., Mins. of Ev. 1823 (542) V.1

Sel. Cttee. on Metropolis Sewers Rep., Mins. of Ev., App. 1834 (584) XV.197

Sel. Cttee. to consider Plans for Application of Sewage of Metropolis to Agricultural Purposes Rep., Mins. of Ev., App., Index 1846 (474) X. 535

Sel. Cttee. on Great London Drainage Bill Mins. of Ev., Index 1852-53 (629) (629-1) XXVI.387, 571

Sel. Cttee. to inquire into best Means of Utilising Sewage of Cities and Towns of England First Rep., Mins. of Ev., App. 1862 (160) XIV.321 Second Rep., Mins. of Ev., Index 1862 (469) XIV.439

Sel. Cttee. to inquire into Plans for dealing with Sewage of Metropolis and Large Towns, and its Utilisation to Agricultural Purposes Rep., Procs., Mins. of Ev., App., Index 1864 (487) XIV.1

Sel. Cttee. on Metropolis Sewage and Essex Reclamation Bill Special Rep., Procs., Mins. of Ev. 1865 (171) VIII.29

**Sewerage - Reports of Commissioners**

Rep. on Means of Deodorising and utilizing Sewage of Towns, by H. Austin, Chief Superintending Inspector 1857 Session 2 (2262) XX.447

Royal Com. to inquire into best mode of distributing Sewage of Towns Preliminary Rep. 1857-58 (2372) XXXII.347 Second Report 1861 (2882) XXXIII.463 Third Report 1865 (3472) XXVII.303

Rep. of Cttee. of Local Govt. Bd. to inquire into Modes of treating Town Sewage; Plans 1876 (C.1410) XXXVIII.117

When it is debated the issues seem to be the profitability of selling the sewage or the pollution of rivers by sewage. Within the local government structure there is the same level of interest, there are committees and reports but little comment in the local press.

However, the implementation of a sewerage programme is probably just as important as the introduction of the water system and certainly the water system cannot be investigated in isolation. There are two elements to the sewerage systems of most towns, in some places these were implemented concurrently, whilst in others they were not seen as linked until well into the nineteenth century. This is to some extent due to the organisation of the local government in the towns and in some cases to the more commercial aspects of the systems. This chapter will be organised in two parts. Firstly it will look at the development of the sewerage networks as we define them today - the underground pipes and the discharge mechanisms. The second part of the chapter will consider the domestic sewerage situation and how this changed throughout the century in response to the increases in water supply and in the perceived sanitary risks from various methods of sewage storage and removal.

The cost of the introduction of sewerage systems can be effectively split into two parts. The cost of the underground pipe network was born initially by the local authority and recovered eventually from the ratepayers in the urban area. The method of introduction of the underground system was often 'piecemeal', and therefore did not require a single, large special rate to cover the expense as a new water system did, thus the ratepayer was not aware of the larger project taking place in the town or city. This system removed the 'public' problem of sewage by ensuring that it was transported from the urban environment quickly. The second part of the cost of the new sewerage system was borne by the individual property owner or dweller who had to fit the necessary domestic appliances to ensure that the sewage was removed from the domestic environment. In some towns this was funded by the local authority but the underlying qualification was the possession of sufficient room in the dwelling or yard to have a water closet, and the supply of piped water to the households to flush the sewerage pipes.

Chadwick was so insistent that his integrated water and sewerage system should work that he established a commercial company to offer fixed packages to towns. The Towns Improvement Company tried in several towns to persuade the authorities to adopt the 'ready to assemble' package, and it came as an unwelcome shock to Chadwick when towns like Manchester decided that they would not adopt a water borne sewerage system, but install instead a dry conservancy pail system. The implications of their decision were more than financial for Chadwick. If a leading

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Royal Com. on effects of Metropolitan Sewage Discharge into River Thames First Rep., Mins. of Ev. Apps. 1884 (C.3842) (C.3842-1) XLI.1, 69 Second Rep., Mins. of Ev., Apps. 1884-85 (C.4253) (C.4253-1) XXXI.341, 409

industrial town like Manchester would not follow central government directives<sup>5</sup> then it was unlikely that smaller towns could be persuaded to leave the traditional engineer - consultant system in favour of the all - inclusive package.<sup>6</sup>

A different issue to that of how to remove the sewage from the domestic environment, was the question of where to 'dump' the contents of the sewers and closets. In the 1840s there were two primary methods of treating sewage. Land filtration involved pumping the liquid or water suspended sewage over land which was then used for growing crops. This method of treatment had been promoted by the German chemist Justus von Liebig. The second mode of treatment involved the use of chemicals as precipitators. The sewage was pumped into tanks, the chemicals added, and the resultant sludge sold as fertilizer. Between 1846 and 1856 there were 417 patents taken out for sewage related chemical precipitants.<sup>7</sup>

Undoubtedly, the events happening in Britain's other large towns and cities influenced the course of action in the three cities studies here. Through the information channels of the Local Government Board and other organisations, developments in sewerage technology would have reached the relevant local authorities. Some of the most important intelligence on sewerage systems and sewage disposal emanated from the inquiries into London's sewerage problems, which were inextricably linked with the capital's water supply (the rivers were both the source of water and the recipients of sewerage). Thus much of the advice which is presented in the Parliamentary Select Committees and Reports related specifically to London, but was translated as national doctrine by a number of towns and cities. The chronology of the official reports shows the changing ideology on sewage disposal. The period from Chadwick's 'reign' to the late 1850's stresses the need for the swift removal of sewage from the urban areas, even if it entailed using the water 'arteries' to accomplish this. The second phase which lasted till about 1870 saw the impact of new research which concluded that land irrigation sewerage systems were efficient and effective without the risk of promoting the spread of disease. A good illustration of this change in emphasis is Robert Rawlinson's report to the Royal Commission into the Best Mode of Distributing the Sewage of Towns, which he subsequently published in the *Transactions of the National Association for the Promotion of Science* in 1864. He gives a comprehensive summary of how various cultures deal with the removal and disposal of sewage, and concludes that:

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<sup>5</sup> Chadwick held three influential posts - on the Metropolitan Sanitary Committee, on the General Board of Health and on the New Metropolitan Commission of Sewers.

<sup>6</sup> A. Redford and I.S. Russell, *The History of Local Government in Manchester* (London: Longmans, 1940) p.140 - 144

<sup>7</sup> H.H. Stanbridge, *History of Sewage Treatment in Britain* (Maidstone: 1976) p.272



'If the rivers of England are to be purified, it must be by intercepting canals to receive all fluid refuse and convey it to land for purposes of irrigation, or to be treated with disinfectant and precipitants so as to be purified in its course....Sewage irrigation may be carried on over the same ground for an indefinite period, as is proved by some of the land near Edinburgh, which has been regularly irrigated upwards of two centuries.'<sup>8</sup>

Legislation during this period kept pace with the evolution in sewerage ideology. The 1861 Local Government Amendment Act required Local Authorities to purify sewerage if they had to discharge it into rivers, and the 1865 Sewage Utilisation Act (which resulted in part from the creation in 1864 of the Royal Commission on the Prevention of River Pollution) allowed local authorities to prosecute river polluters.

From the 1870's sewerage technology was increasingly subservient to the demands to reduce river pollution. This again reflects the dominance of London in national policy, and the Royal Commission on the Effects of Metropolitan Sewage Discharge into the River Thames which reported in 1884 was seminal in the development of chemical treatment of sewage as a practical alternative to land filtration. However, in many towns the continuing plethora of solutions produced inaction rather than over-action. Hamlin shows this most clearly in his study of Merthyr and Leamington Spa.<sup>9</sup> The municipal corporations of these towns, which had taken on the task of reducing the pollution of their local rivers, degenerated into squabbles over failed sewerage systems, costs to the ratpayers and worries over central government inspections. Hamlin thus summarises the message sent back to central government from these bewildered towns:

"Throughout most of the second half of the century this was the tone of local remonstrations to the central government: that it was unfair to require action unless there were demonstrably effective solutions that could be applied. In fact, how to purify sewage was indeed a "vexed subject" in the mid-1860's and for two decades thereafter. There was a growing list of towns in which sewage treatment plants had failed to live up to expectations'<sup>10</sup>

A tentative conclusion which has been drawn by several historians from studies of the introduction of sewerage systems in the nineteenth century is that the role of river pollution lawsuits was in many towns the crucial determinant, rather than the

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<sup>8</sup> R. Rawlinson, 'The Sewage of Towns', in *Transactions of the National Association for the Promotion of Science*, 1864.

<sup>9</sup> C. Hamlin, 'Muddling in Bumbledom: on the enormity of large sanitary improvements in four British towns, 1855-1885', *Victorian Studies* 32 (1985) pp.55-83.

<sup>10</sup> *ibid.*, p.67.

conventional theory which suggests that sewerage systems were part of the 'natural' progress of public health reform.<sup>11</sup> Many of the sewerage systems were the product of prosecution under local statutes rather than public health Acts. Luckin's meticulous analysis of legislation during the late nineteenth century highlights the relationship between dominant economic interests and the failure to produce more effective anti-pollution measures. His explanation for this is that such measures would have 'trespassed in an unthinkable manner on the rights of property and the rights of capital'.<sup>12</sup>

A broad picture thus emerges of sewerage systems in the nineteenth century, in which a main theme is the role of river pollution in stimulating the introduction of systems, coupled with local level confusion over the rapidly changing information on technology. The following studies of Liverpool, Belfast and Glasgow may or may not reflect this view. However, what emerges from the work of Hamlin in particular is a plea that histories of sewerage and other sanitary systems be written with a degree of compassion. We must not underplay the 'staggering complexity' which urban systems involved. Any explanation must incorporate an understanding of not only changing technology but also financial and administrative limitations imposed by the size of the town and the competence of its 'urban managers'.

### 5.1.a Glasgow

Glasgow did not have any public sewers till the end of the nineteenth century, although there had been complaints about the discharge of rubbish into the river Clyde from the early seventeenth century.<sup>13</sup> It is the most reluctant of the three cities to provide this necessary service for its inhabitants. The provision of water and sewerage systems theoretically should go hand in hand, but whilst the expenditure on a water system can be seen as producing an enjoyable benefit in the form of clean water, a sewerage system only removes an evil. It is understandable therefore that nineteenth century Glaswegians would evade the problem for as long as possible. However, with the rapid increase in the urban area, the issue could not be avoided for ever.

Until the introduction of gravitation water in the 1855, there was not the opportunity to introduce a formal sewerage system of the sort that we are familiar with today. The public sewers that Cunnison and Gillfillan mention as being created in the

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<sup>11</sup> J.R. Kellet, 'Municipal Socialism: Enterprise and Trading in the Victorian City', *Urban History Yearbook* 1978. Kellet's search for order in the chaotic chronology of municipalisation leads him to conclude that: "each step seemed logical. From the uncontentious water and sanitary schemes, corporate action naturally and easily extended to concern for street lighting..." p.42.

<sup>12</sup> B. Luckin, *Pollution and Control: A Social History of the Thames in the nineteenth century* (Adam Hilger: Bristol, 1986) p.173.

<sup>13</sup> J. Cunnison and J.B.S. Gillfillan, *3rd Statistical Account of Glasgow* (Glasgow: Collins, 1958) p.561

1790s are more like drains and channels to convey rain water and liquid sewage down to the river Clyde. The Police Act of 1800 gave power to the Town Council to construct common sewers, drains and water courses within the city.<sup>14</sup> The construction of sewers increased in the first half of the century, reaching a length of 4 miles in 1816 and expanding to 88 miles by 1876, which was hardly adequate to deal with the sewage of nearly 500,000 inhabitants. Under the 1843 Police Act the Police Commissioners could compel property owners to construct private drains to connect with the common sewers in the streets. This meant that by the middle of the century there were three types of sewer in Glasgow. First, the private sewers which were the responsibility of the owner but came under the supervision of the Police Department who gave permission to connect with the second type - the public sewers - which drained the roads. Thirdly, there were the common sewers which connected private roads and courts to the public sewers. The costs of making and maintaining these various types of sewers was apportioned between the property owner and the Police Board. The common sewers were paid for by the residents of the private roads and courts but the standard was checked by the master of works, and the condition of all drains from residential property was under the jurisdiction of the Sanitary Inspector.

The problem of disposing of domestic sewage was small in comparison to the problem of industrial waste. With the accumulation of chemical and textile industries in Glasgow, the police authorities could compel the construction of special sewers. Although Glasgow progressed in terms of removing the liquid sewage from houses and industries, the problem still remained of where to deposit it. The river Clyde was the lazy but convenient option. When the water became too polluted for the Cranstonhill Waterworks Company to sell in the 1820s the remedy was to relocate the waterworks on a site above the city and therefore above the contaminated water.

It was not until the 1850s that schemes to solve the problem were presented. However, even these plans were based on the idea of making the progress of the sewage swifter down to the open sea rather than finding an alternative method of disposal. It was proposed to construct reservoirs further up the river and to release the water in large quantities to scour the harbour and remove the accumulation of sewage.<sup>15</sup> The Council rejected this idea and in 1853 commissioned a report from J. F. Bateman and Professor Anderson of the University of Glasgow. They submitted their report in 1858 but did not come to any conclusions on how the pollution of the Clyde could be reduced. The Corporation applied to Bateman and Anderson again in 1866, who this time joined forces with the 'Sewage King', J. W. Bazalgette, who was also

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<sup>14</sup> J. Bell, *Glasgow: its Municipal Organisation and Administration* (Glasgow:1896) p.137

<sup>15</sup> D.M. Stevenson, *Municipal Glasgow : its Evolution and Enterprises* (Glasgow :Glasgow Corporation, 1914) p.263

responsible for the London sewers. They presented their report in July 1868.<sup>16</sup> In preparing the report they had investigated the new sewerage system which was being installed by Bazalgette in London, and had made extensive inquiries into how other towns disposed of their sewage. The opinions of local men had also been considered, in particular a scheme to transfer sewage from the high level part of Glasgow to neighbouring agricultural land for irrigation and fertilization. One of the more outrageous suggestions was to build a wall up the middle of the river Clyde and to compel the tidal water to flow up one side and then back down the other. There were also plans for the use of chemicals for the separation and purification of the sewage. Bateman and Bazalgette recommended a system of intercepting sewers to collect the sewage from the high level districts and to remove it to the periphery of the built up area. The lower lying districts along the banks of the Clyde, in particular on the south side, were to have their sewage pumped to a collecting station. They found no technical difficulties with the sewers currently in use, as the slope of the ground in the city meant that there was always enough momentum to force the sewage through to the lower parts of the city. The problem arose when the sewage reached the river. It had long been suggested that the sewage remained in the city part of the river for a considerable time. This was finally tested by Bateman and Bazalgette who put a quantity of wooden floats into the river at the point at which the sewage would normally be discharged, and they then monitored the progress of the floats down to the open sea. It was discovered that the majority of the floats took two weeks to make the journey, and that even after a month there were some floats remaining in the harbour area.

In order to minimise the costs of transporting the sewage (estimated at 70 gallons per person per day) they proposed that 'pure' water i.e. rain water should be allowed to make its way into the river unimpeded, and that only the contaminated water needed to be diverted, thus they had to design a system that would eventually cope with 110 million gallons of sewage in 24 hours.

The chemical treatment of sewage was in the 1860s still comparatively untested. Bateman and Bazalgette therefore proposed to discharge the sewage onto an area of land where it could undergo filtration to render it harmless. If this method could be coupled with agriculture, the improved yields from experiments suggested that the corporation could sell the sewage. The 1868 report refers to the use of sewage on land near Edinburgh and Croydon. It had been known for some time that passing sewage over sand or gravel had a disinfecting action, and that sewage could be applied to most crops successfully, if the underlying drainage was suitable. However, there was not enough suitable land within the Clyde basin to receive all of Glasgow's sewage. Bateman and Bazalgette thus proposed to transport the sewage by a 9 ft circular conduit

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<sup>16</sup> J.F. Bateman and J.W. Bazalgette, *Report on the Sewerage of Glasgow* (Glasgow :1868)

to the Ayr coast near Saltcoats. The main conduit was to have a fall of 20 inches per mile to prevent the accumulation of deposits en route.

The finances of the plan revolved not only around the cost of constructing the conduit to Saltcoats but also the revenue from the sewage. In Glasgow in the 1860s there were approximately 90,000 households. Only 50,000 of these according to Bateman<sup>17</sup> had water closets. (The discussion on W.C.s will be considered in section 5.6.) Therefore the sewerage system dealt with only half of the solid sewage. The remainder was collected from the houses by the Police Board.<sup>18</sup> This was mixed with the ashes and road sweepings and sold for a profit of £18,000 per annum, leaving the deficit on the sewerage expenditure as only £9,000. Bateman envisaged that as more households converted from privies to water closets that the decrease in income through the Police Board scavenging and sewerage could be made up by selling the liquid sewage to the farmers in Ayr. The actual cost calculated by Bateman was £1,089,756, of which £374,000 was for the intercepting sewers, £50,000 for pumping equipment and stations and £625,000 for the conduit. This translated into an annual expense of £55,000 - equal to a rate of 4.5 d in the £ for a period of 6 years. This would be offset by the profit from the sale of the sewage.

Bateman and Bazalgette's report does not mention the enhancement to the public health which would no doubt accrue from such a sewerage system. The justification for the plan is more aesthetic - improving the smell and appearance of the river - and financial - as the scheme would eventually be totally profit orientated. This falls into line with the national opinion on the financial assets of sewerage in the mid - nineteenth century. Unlike the reports submitted for the water supply, the ones for the sewerage system do not stress the comfort or the health of the inhabitants. The connection with mortality is more tenuous. It is possible that if the sewage reports of the 1850s and 1860s had used the 'scaremongering' tactics employed by the water reports, the corporation of Glasgow would have acted more swiftly to install a sewerage system. However, the prime motivating force over the sewerage question in Glasgow at this time was financial. The cost of the Loch Katrine water scheme had been huge, but had been justified partly on the grounds of facilitating the growth of industry in the city. The council therefore abandoned the idea of a sewerage system till 1874, when a Royal Commission under the leadership of Sir John Hawkshaw recommended a new plan at a cost of £2,500,000 and an annual maintenance bill of £8,000. By this time the motivation of the scheme had switched from an attempt to make a 'municipal profit', to coercion from national authorities to clean up the river Clyde. A Bill was promoted in 1877 by the corporation aimed at uniting all the towns along the Clyde in an effort to

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<sup>17</sup> *ibid.*, p.165

<sup>18</sup> Sewage Committee Minutes SRO 1877

prevent the dumping of sewage in the river.<sup>19</sup> This level of co-ordination proved impossible in local government and the problem of the disposal of Glasgow's sewage was not solved until the intervention of the Caledonian Railway Company .

In 1887 a Bill was presented to Parliament by the Caledonian Railway Company for permission to pass a tunnel under the streets of Glasgow to construct the Glasgow Central Line. The Corporation initially opposed the Bill on the grounds of the damage that might be done to the network of pipes and sewers. The railway company then agreed to pay the full cost of a new sewerage system, including a treatment plant. The final plan was to remove all the sewage from the east and north of the city to a treatment plant at Dalarnock which was capable of handling 10,000,000 gallons of sewage per day. The Act was passed for this scheme in 1891 and the works completed in May 1894.

Glasgow therefore ultimately benefited from leaving the introduction of a sewerage treatment system so late. It is possible with hindsight to see that they thus avoided needless expenditure on a filtration system such as that promoted by Bateman and Bazalgette. By the 1890s chemical treatment of sewage was an efficient and cost effective operation. In 1896 a second Act was passed to deal with the sewage from the western parts of the city and Partick, and a third Act in 1898 extended the service outside the municipal limits to treat the sewage of Rutherglen, Govan, Pollockshaws, etc. These three Acts formed the basis for a completely new sewerage system within Glasgow. The Dalarnock works were supplemented in 1904 by another chemical treatment plant at Dalmuir. At both plants the sewage was mixed with precipitating agents such as lime and sulphate of iron, then the water was removed and the solids sold to farmers as manure. The sludge from the Dalmuir works was surplus to the requirements of the farmers and therefore loaded onto a steamer and taken 40 miles out to sea and dumped. The final stage was completed in 1910 when a third treatment plant was constructed at Sheildhall.

### **5.1.b Belfast**

Like Glasgow, Belfast had the option of disposing of its sewage locally. In this case the receptacles were the river Lagan which flows through the centre of the city, and into Belfast Lough, and the Farset river. The additional problem faced by Belfast was flooding. The city lies almost at sea level and throughout the nineteenth century was subjected to periodic flooding. This exacerbated the problem of the construction of sewers, as in times of flood the water level in the system would rise and the sewage be forced back into the streets. This continued until equipment was patented to stop the

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<sup>19</sup> D.M. Stevenson, *op cit.* p.269

backwash. As with Glasgow, the initial source of water for the city was the local rivers and springs. As the built up area increased, the pollution of the rivers meant that they became unfit for use as drinking water and a new source had to be found. There were attempts made to clean up the rivers and there were by-laws to prevent the dumping of rubbish or contaminated water, but these were difficult to enforce.

Belfast was slow to adopt water closets, so the sewers which were in use in the first half of the century were intended purely to drain rainwater and liquid sewage from properties and factories. There was a rudimentary network of pipes draining the higher levels of the city and emptying directly into the Lough. The drainage of the city came under the jurisdiction of the Corporation of Belfast. The 1840s saw a period of intensive unification and extension of the sewer system - to ensure the drainage of the streets but not yet enforcing the connection of all properties to the main sewers. This weakness was soon recognised and plans were made to make improvements in the 1850s. However, the financial crisis caused by Bates' overspending necessitated dramatic cuts in expenditure. New schemes were postponed and spending on existing services trimmed, especially in mundane areas such as sewerage, drainage, removal of nuisances and the provision of baths houses. The financial crisis had been caused by an ambitious exercise by the Belfast Corporation in 'municipal trading'. In the 1830s the Council had voted to cut expenditure to allow them to make a reduction in the rates. This was followed in the 1840s by a complete reversal of doctrine masterminded by Bates towards a programme of massive investment in 'profitable' services which would guarantee a return on the capital invested. For a period of 10 years the Council considered all expenditure openly on the merits of the investment potential rather than the ultimate benefit to the inhabitants.

Bates was removed from office in 1854 but the control of the Council remained in the hands of the Conservatives. Sewerage schemes did not come high on their list of priorities. In 1844 the annual expenditure on sewerage was £381 - only 4% of the municipal budget. In 1852 the position was slightly better, with £3,000 per annum. This level of funding meant that only 87 of more than 600 streets in Belfast had any form of sewer. Before 1834 the maintenance of the sewers was the responsibility of the Police Commissioners. They spent a total of £970 between 1829 and 1833 on sewerage, paid for out of the police rate.<sup>20</sup>

Clearly by the 1850s massive investment was needed in the sewerage network. The Corporation received constant criticism from the medical profession in the city, and the staff of the Improvement and Nuisances Department warned of the threat of Cholera in 1854. They issued 9,000 notices ordering the removal of nuisances, opening of

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<sup>20</sup> *Belfast Newsletter* - various articles and reports of council meetings - 4.2.1845, 8.8.1845, 2.1.1846, 4.10.1852

blocked sewers and the whitewashing of houses. The Sanitary Inspector issued monthly reports to the Council meetings and in July requested an inquiry into the state of the sewers.<sup>21</sup> The work of the Medical Officer (Browne) and his staff on the Improvement Committee, by making over 40,000 visits and issuing 25,000 notices prevented the cholera mortality reaching the expected levels. Nevertheless, in February 1855 when the threat had passed, the Council dismissed most of the staff of the improvement committee in one of their cost-cutting exercises. The Medical Officer resigned in protest and no successor was appointed.<sup>22</sup>

There had been some attempt in 1846 by the Sanitary Committee of the Vestry to force the Improvement Committee of the Corporation to improve the drainage of the town, and in particular to reduce the pollution of the Blackstaff river, a tributary of the Lough. The Corporation obtained powers in an Improvement Act in 1850 to borrow £15,000 to finance new drainage channels. However, the policy of the Corporation was to increase revenue through land speculation - by buying up sites in the city centre and waiting till the value rose before selling and using the profits to finance improvements. The 1850 Act did not include permission for the Corporation to use compulsory purchase and therefore the opposition of the millowners on the river and the lack of profit from land deals prevented the Act being fulfilled.

It was not until then that the Corporation began to consider how to improve the sewerage in Belfast. Spending was beginning to increase, and two reports were commissioned. The first in 1866 was by J.J. Montgomery. He found that the existing sewers were virtually on the flat and well below sea level. There were valves at the outflows in the Lough which were closed for up to 18 hours a day, thus allowing the sewage to build up in the sewers under the streets. This was viewed locally as highly dangerous as it produced sewer gases in the houses, causing 'death from large quantities of gas, bad smells and in lesser quantities, blood poisoning and zymotic diseases.'<sup>23</sup> Montgomery recommended that Belfast should adopt the system of intercepting sewers as proposed by Rennie who had suggested a similar system for Liverpool in 1816. In the event, Montgomery was called back in 1867 to compile a report with Bazalgette, who recommended that improvements needed to be made in the water supply before any new system of sewers could operate efficiently.<sup>24</sup> As in Glasgow, the use of the liquid sewage for fertilizing fields was suggested as a way of offsetting the costs of installation. The report estimated that the cost of pumping the sewage annually would be £1,800.<sup>25</sup>

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<sup>21</sup> G.J. Slater, *'Belfast Politics 1798 - 1868'* (Unpub. D.Phil thesis:Ulster University 1982) p.273

<sup>22</sup> *Belfast Newsletter* 3.7.1854, 4.9.1854.

<sup>23</sup> *Belfast Newsletter* 2.2.1855.

<sup>24</sup> The wide ranging work of the water engineers will be considered in detail in chapter 7.

<sup>25</sup> J.J. Montgomery, *Report on the drainage of the Borough of Belfast* (Belfast: Baird, 1866) p.9; J.J. Montgomery and J.W. Bazalgette, *Report on Belfast Drainage* (Belfast: Baird, 1867) p.6



No action was taken following these detailed investigations, although Montgomery was called back in 1870 and 1875 to give further advice. It was not until 1893 that an adequate drainage system was finished in Belfast, using a variety of hints supplied by Montgomery and Bazalgette. This network drained into the Lough through a wooden pipe, but this was not long enough to prevent silting up in the Harbour, so in 1911 a Royal Commission decided that a concrete culvert should be installed further up the coast and therefore away from the inhabited areas. Such a long delay (from the initial report in 1866 to the final installation of the system in 1893) needs some explanation. However, neither the Corporation minutes (which are patchy in their detail) nor the local newspapers such as the Belfast Newsletter and the Belfast Morning News, contain any supplementary information or evidence of public pressure for the sewerage problem to be resolved.

The general conclusion on Belfast's sewerage infrastructure must therefore be that the city suffered for its indecision over the timing of the installation. From the reports into the high death rate in the city it is clear that the municipal authorities were fully aware of the links between deficient sewerage systems and high rates of mortality. Drawing on conclusions from chapter two, it would seem that the corporation did not respond to pressure from residents over sanitary matters. This theme emerges again in the chapter on the installation of public baths and wash-houses, and it was evident in the debate over the water supply. With this in mind, the following section on Belfast's domestic sewerage and refuse disposal is likely to show a similar level of inactivity and lack of integration of urban administration.

### 5.1.c Liverpool

For the purposes of sewage removal, Liverpool was probably in the best situation. The slope of the land down to the river was sufficiently steep to allow the swift evacuation of water from the drainage network and the river Mersey was a suitable receptacle. The tidal power of the estuary is strong enough to carry away any deposits, and unlike Belfast and Glasgow there are no possible places for debris to become lodged.

Liverpool installed its system of sewers much earlier than in the other two cities. The final 'artery' was finished in 1868.<sup>26</sup> The system of sewers in Liverpool had progressed on an 'ad hoc' basis in the late eighteenth century under the control of the council. However, by 1815 the disposal of liquid sewage in the town was proving a problem. The primitive sewers were transporting the water only as far as the bottom of

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<sup>26</sup> J. Newlands, *Report to the Health Committee of the Borough of Liverpool on the Sewerage, Paving and Cleansing and other works carried out under the Sanitary Act from 1863 - 1868* (Liverpool Corporation Health Committee: 1869)

the hill, where it remained in the sewers and occasionally flooded the lowest parts of the town. Rennie was called in to report on the state of the system, and what could be done to improve it. He identified two major problems, which were verified by Newlands in his first exploratory report to the Health Committee in 1848

The flow of the water in the sewers is exposed to a periodical stopping up during high water. This is an evil of great magnitude, and one from which the lower parts of the town suffer severely, particularly Paradise Street, Whitechapel, and the streets along the line of the docks. The cellar floors in these places are in many instances below the level of the tide, for six hours in the twenty-four...A great evil arises in Liverpool as in London, from the outlets being left open at low tide, so that every blast of wind traverses the whole length of the sewers, and forces the foul gasses up gully holes and into houses. The subsequent rise of the tide does the same by pressure. Second, around the outlets into the basins an accumulation of deposit takes place, which materially affects the usefulness of the basins, and is also a fertile cause of disease.<sup>27</sup>

The sewers which Rennie described were the old fashioned sort - square or rectangular and large enough to admit a man to make repairs. These were efficient for transporting water but not solids, which tended to remain on the bottom of the sewer. Midwinter suggests this is the rationale for the unusual by-law which operated in early nineteenth century Liverpool which prohibited the connection of water closets to the main sewer network.<sup>28</sup>

Rennie proposed an intercepting sewer to relieve pressure on the sewers in the lowest parts of the town. His recommendation was not carried out until 1830, following the modifications by Liverpool's engineer, John Foster.<sup>29</sup> In 1822 a new administration body was created - the Highway Board. These Commissioners were entrusted with the paving and sewerage of Liverpool. They had the power to levy a sewer rate, which varied throughout the town, and was reliant on the owners of property supplying the capital to the Board before construction of the sewers could start.<sup>30</sup> As their title suggests their primary consideration was the state of the roads. As an expanding sea port it made financial sense to keep the main lines of transport and communication in good condition to ease the flow of commercial traffic. However, Dr. Lyon Playfair in the 1845 Report estimated that the Highway Board had not been efficient in its duty of constructing drains and sewers. In 1845 there were 1405 streets

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<sup>27</sup> J. Newlands, *Report to the Health Committee of the Borough of Liverpool of the Sewerage and other works under the Sanitary Act by the Borough Engineer* (Liverpool: 1848) p.9

<sup>28</sup> E. Midwinter, *Old Liverpool* (Newton Abbot, David and Charles, 1971) p.109

<sup>29</sup> J. Foster, *On the Sewerage of the Town of Liverpool* (Liverpool: 1846)

<sup>30</sup> J. Newlands, *Report to the Health Committee of the Borough of Liverpool on the Sewerage and other Works under the Sanitary Act* (Liverpool Corporation: Liverpool, 1848)

in the Parish of Liverpool which measured a total of 57.5 miles. Only 235 streets had sewers amounting to 25.5 miles and of this total only 4 miles were in the working class districts of the town.<sup>31</sup> The Highway Board was also responsible for providing contractors to remove solid sewage from dwellings.

The 1846 Sanitary Act in Liverpool gave the Corporation the power to levy rates for the purposes of paving, sewerage and general sanitary measures.<sup>32</sup> The responsibility for the maintenance of the sewer system was transferred to the Health Committee. James Newlands was appointed as Borough Engineer in February 1847. He now had the financial resources to effect his masterplan for the sanitary improvement of Liverpool. Although his main contribution was the extensive sewerage system, Newlands also had given the council plans for a sanitary 'utopia'. He never received the due public acclaim that was given to his contemporary Hawkesley for his water system. As in many official municipal histories, the issue of the provision of the sewerage system has been glossed over. Midwinter attributes this to the Victorian aversion to anything 'dirty'. He claims that sanitary reports were sometimes 'censored or withdrawn from public view on the grounds of obscenity.'<sup>33</sup> Newlands' achievements in view of the contemporary 'taste' must therefore be seen as all the more remarkable. His first report recognised all the essential elements of a successful sewerage system:

1. The removal of foul matter in suspension in enclosed service mains into the main sewers.
2. The drainage of low lying areas.
3. The prevention of foul matter from 'vitiating' the atmosphere, and its re-use as a fertilizer.

In all these aims Newlands was in line with the ideas of Chadwick. The re-use of sewage instead of discharge into the Mersey was a particular concern of Newlands, but this was never achieved on a large scale in Liverpool.<sup>34</sup>

Newlands originally wanted a dual sewer system in Liverpool - one for the dirty water from houses and factories and a second for storm water. This was not practical so a single system operated till the 1895 re-organisation of the network. This re-

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<sup>31</sup> *Ibid*, p.62.

<sup>32</sup> Liverpool Sanitary Act 1846 (9+10 Vict c.127) Sections 151 and 152 refer to the corporation having powers to levy a rate on "persons who shall hold, use or occupy any house , etc" The rate could be varied for the individual districts, in accordance with Newlands' wishes that those people who directly benefited should pay proportionately more for it. (Section 162) The Act also allowed for the rates to be prospective or retrospective to the actual laying of the sewers.

<sup>33</sup> E. Midwinter, *op.cit.* p.100.

<sup>34</sup> The Liverpool Sewage Utilisation Act 1866 gave permission for the use of night soil to fertilize land at Ince Blundell (Borough Engineers report 1869 p.8-9)

organisation was done to accommodate new areas incorporated by the boundary extension. Some of the new districts, for example, Fazakerley and Aintree were located over the 'ridge' of Liverpool and therefore outside the natural drainage basin. Newlands in the 1850s and 1860s improved the existing sewers by removing sharp bends as Roe had done successfully in London.<sup>35</sup> He also reduced the size of the sewer outlets to increase velocity. His main achievement was the installation of three more intercepting sewers like Rennie's, except these used the new improved small egg shaped Chadwickian design, which worked on the principles of momentum of flow and gradient of the pipes, rather than the size of the sewer. These three sewers ran parallel to the Mersey, and he had the foresight to plan the system to accommodate the future expansion of the town, and to allow easy access to minimise problems with water and gas pipes. Ventilation pipes were also included in the scheme to allow for the evacuation of sewer gasses which Newlands thought could promote illnesses. Extensions to the secondary sewerage network were ordered by the Health Committee.<sup>36</sup> The Medical Officer of Health and the Borough Engineer together produced a list of streets to be sewered first at a cost of £5,300.<sup>37</sup> The MOH could use his powers to get a street sewered on health grounds, but Bate <sup>38</sup> states that prior to 1856 decisions on which streets to sewer were taken on financial grounds - according to the ability of the owners to pay, or rather to make loans to the Corporation to do the work. Thus the secondary network progressed through a series of very short term plans, constrained by finance.

The 'finished' Newlands sewerage and drainage system was relatively small. There were only 249 miles of sewers in comparison to Bazalgette's London network of 1,300 miles. There were 9 primary sewers, and many streets had multiple branches. However, the reconstructed map, which uses the sewer listings from the reports of the Borough Engineer, shows that all parts of the city had access to a sewerage system, with the exception of the newly developed areas of Toxteth Park and Scotland Road.<sup>39</sup> As Reeves has recognised, Newlands was a pioneer in installing a Chadwickian system so early in the century. The problem of a lack of correlation between the efforts of the Health Committee and the mortality levels, as identified by Boulton <sup>40</sup> was due to the

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<sup>35</sup> P.Reeve, *Sanitation and Mortality in Liverpool 1847-1900* (unpublished B.Phil. thesis: Open University, 1986)

<sup>36</sup> Newlands "ideal" sewer system is set out in detail on page 12 of his 1848 report

<sup>37</sup> Health Committee Minutes, Corporation of Liverpool, 27.11.1847. (LRO)

<sup>38</sup> W. Bate *Sanitary Administration of Liverpool 1847 - 1900* (Unpub. M.A. Thesis, Liverpool University, 1955)

<sup>39</sup> *Porcupine* 14 15.6.1872 p.169

<sup>40</sup> J. Boulton, 'On Sanitary Nescience', *Proceedings of Liverpool Architectural Society* 1879 p.75. Boulton was a local architect and closely involved with the Land and Property Owners Association, who opposed the efforts of the corporation to improve sanitation as they interfered with private property rights.

delay in the companion system - water supply. Liverpool was well placed geographically to operate the water carriage system for the removal of solid as well as liquid sewage as recommended by Chadwick, but the solid matter could not be transported if there was insufficient water in the network to flush the sewers. Newlands and Hawkesley did not agree on many things, such as the relative merits of applications of sewage to agricultural land, and the alternative sizes of sewers available, but they did recognise that the sewerage system needed the Rivington water which was due to come 'on tap' in 1857. Thus when Rivington failed to provide the quantity of water initially specified, the continued water shortages of the mid nineteenth century meant that the benefits of Newlands work were not realised. A crisis point was reached in 1864 when the sewers had to be cleaned out manually and the gully traps flushed with water from carts.<sup>41</sup>

The introduction of Vyrnwy water in 1893 finally allowed the sewerage system to be used to its full capacity. The Corporation had extended Newlands original network to keep pace with the growth of the city. The cost of the original network was only £215,000 which worked out at 17s per yard. Midwinter stresses the economy of Newlands system by stating that 53 miles of sewers constructed by the Highway Board had cost approximately £500,000.<sup>42</sup> This worked out at 59s per yard as calculated by Playfair in 1845. But the cheapness of the Corporation's new system was at the expense of quality. They used contractors to build the new sewers, but the results were so unsatisfactory, in terms of the quality of the workmanship, the speed of construction and the reliability of the finished sewers, that in 1880 the Corporation took over sewer construction itself using Engineering department employees.<sup>43</sup>

Liverpool achieved a sewerage infrastructure at a comparatively early date. This is surprising, given the incompetence exhibited by the Corporation over the water supply. Possibly the motivation for a swift installation of a sewerage-drainage system was to aid land speculation, given that this was one of the main revenue sources for the Corporation. The city was fortunate to have the services of James Newlands, who had the foresight to plan an integrated system, with provisions for later expansion of the urban area. The sanitary impetus to the installation is however, evident in the priority given to sewerage the worst areas of Liverpool first. The expectations of the expenditure on sewerage were also sanitary - measured by Parkes and Sanderson in their report on the high mortality rates in 1872. The physical structure was seen as a success, but the failure of the water supply meant that ultimately the sewerage system

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<sup>41</sup> J. Newlands, *Report of the Sub-Committee on Mortality* (Liverpool: Liverpool Corporation, 1866) p.42

<sup>42</sup> E. Midwinter, *op.cit.* p.111

<sup>43</sup> Council Proceedings 21.10.1880

did not have the impact expected of it. The links between these two sanitary services is seen most clearly in the following sub-section on Liverpool's domestic sanitation.

## 5.2 Cesspits to Water closets, and Middens to 'Bin Men'

It would be irresponsible try to evaluate sewerage systems entirely on their infrastructure. The network of sewers which lie under our towns and cities were, for the Victorians, only half of the solution to sewage disposal. The sewers initially only removed liquid sewage and there were separate arrangements for the removal of solid sewage and domestic refuse. It would be a fundamental oversight to evaluate a town's sanitary improvements merely by looking at the extension of the sewerage network, yet this was done by some of the most thorough municipal historians<sup>44</sup> who were not aware of the importance of the water closet to the effectiveness of the overall sewerage system. As the nineteenth century progressed, an increasing percentage of properties were fitted with water closets, allowing solid sewage to be removed immediately from dwellings suspended in water, and into the existing sewer networks.

The classic evolution to our present day system is exemplified by Leicester, as demonstrated by Priestley.<sup>45</sup>

1. Cesspits properly constructed and covered.
2. Size of cesspits reduced.
3. Pits emptied at shorter intervals.
4. Substitution with tubs and pails.
5. Addition of absorbents to pails e.g. earth / ashes.
6. Abolition of pails and introduction of water closets.

For general domestic refuse the progression was similar - from middens<sup>46</sup> to ashpits, then to dustbins, with an increasing frequency of emptying for the dustbins. It is only comparatively recently that the accepted 'progression' from privies to water closets has been questioned. Wilson has re-evaluated the unquestioning assumptions made by some of the most reputable public health historians.<sup>47</sup> His main hypothesis is that pail closets (the 'dry conservancy system') were a viable alternative to the water closets and not just a second rate short term palliative for sanitary problems. The testing ground for his hypothesis was Manchester - a city which was an ardent supporter of the pail closet.

<sup>44</sup> For example, see J. Bell, *Glasgow: its Municipal Organisation and Administration* (Glasgow, 1896)

<sup>45</sup> J. Priestley, 'Conservancy versus water carriage systems for the disposal of excreta' *Public Health* (85) May 1895 p.281

<sup>46</sup> These are described in the introduction to the chapter.

<sup>47</sup> A. Wilson *Technology and Municipal Decision Making: Sanitary Systems in Manchester 1868-1910*. (Unpub. Ph.D.. thesis, Manchester, 1990)

His detailed analysis introduces an element of distrust into our acceptance of Wohl's critique,

'An analysis of the introduction of the water closet (which had been patented by Bramah as early as 1778) indicates how much progress was being made in the mid- and late-Victorian years and yet how much still remained to be done.'<sup>48</sup>

Wohl automatically equates water closets with efficiency and cleanliness. He sees them as the only really suitable solution, and infers that towns which had opted for the pail closet system were in an unconscious period of 'madness' from which they would be sure to recover when the error of their ways was shown to them. Wohl does acknowledge that pail closets were an improvement on cesspits and middens, and that there had been to that date, a bias in research towards the underground element of sewerage systems. Wilson sees the recent work of Hamlin<sup>49</sup> as going some way to swinging the pendulum back from the London orientated studies (which emphasised the water closets favoured by central government) to the provincial studies which may stress the value and suitability of the pail closet. Wilson suggests that the bias against pail closets has been exacerbated by the fact that the focus of most public health studies has been on the first half of the nineteenth century, and that this has led to an inevitable avoidance of research into the pail closets which were only introduced seriously from the 1860s.

The weakness in Wilson's work is his overriding desire to champion the cause of the pail closet. By choosing to focus his research on a pail closet city such as Manchester, he automatically adopts the contemporary authority's fervour over this alternative to the water closet. This is despite his initial stated aim to try a symmetrical approach by giving the pro's and con's of the various systems as identified by the nineteenth century contemporaries. His cursory analysis of other nineteenth century large English towns (Leeds, Birmingham, Leicester) is restricted to towns in which the authorities also decided to introduce pail closets. He is therefore testing the *effectiveness* of the dry conservancy method, rather than undertaking an impartial study of the *suitability* of the method. Admittedly, the towns he chooses for the comparative element are all similar - inland and therefore without the option of sea disposal for their sewage - and they all are growing at a rapid rate during the period.

Fortunately, the three cities studied here differ in their choice of sanitary system. Liverpool opts immediately for the water closet and aims for the Chadwickian integrated system of water, sewers and water closets. Glasgow decides to introduce the pail closets - following the experience of Manchester, but to Wohl's relief Glasgow

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<sup>48</sup> A. S. Wohl, *Endangered Lives: Public Health in Victorian Britain* (London: Dent, 1983) p.108

<sup>49</sup> C. Hamlin, 'Muddling in Bumbledom: on the Enormity of Large Sanitary Improvements in Four British Towns 1855 - 1885' *Victorian Studies* (32) 1980

*Figure 5.1 A Traditional Pail Closet*

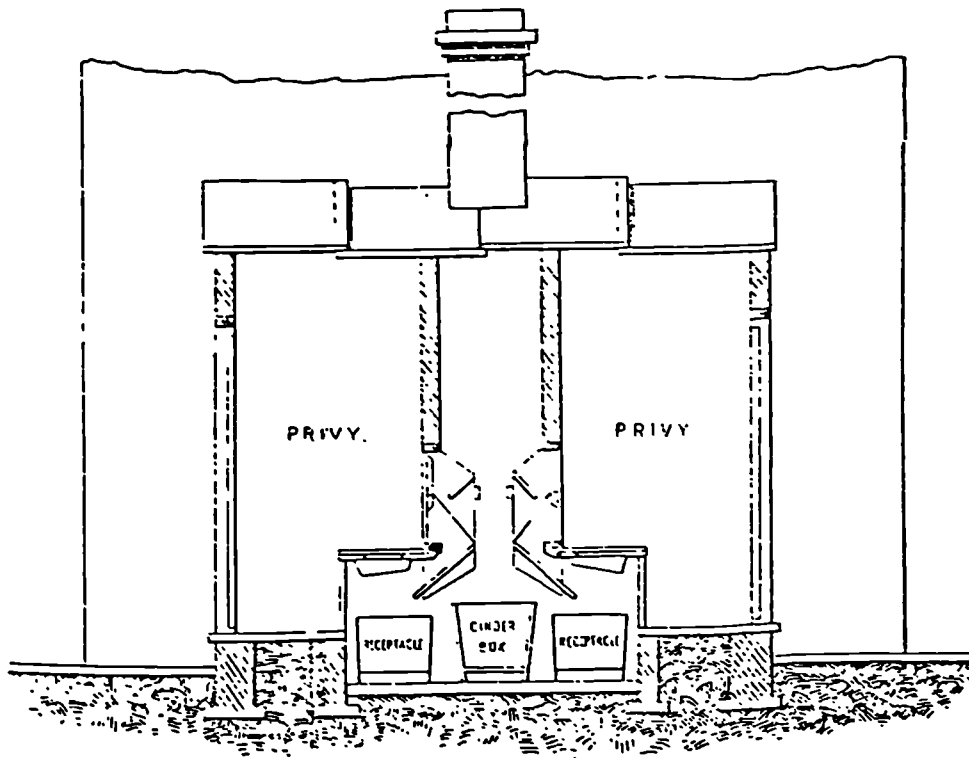
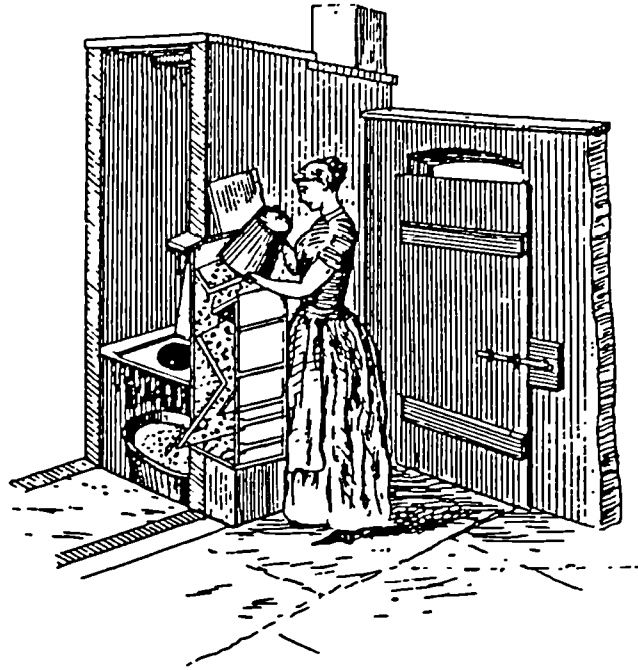
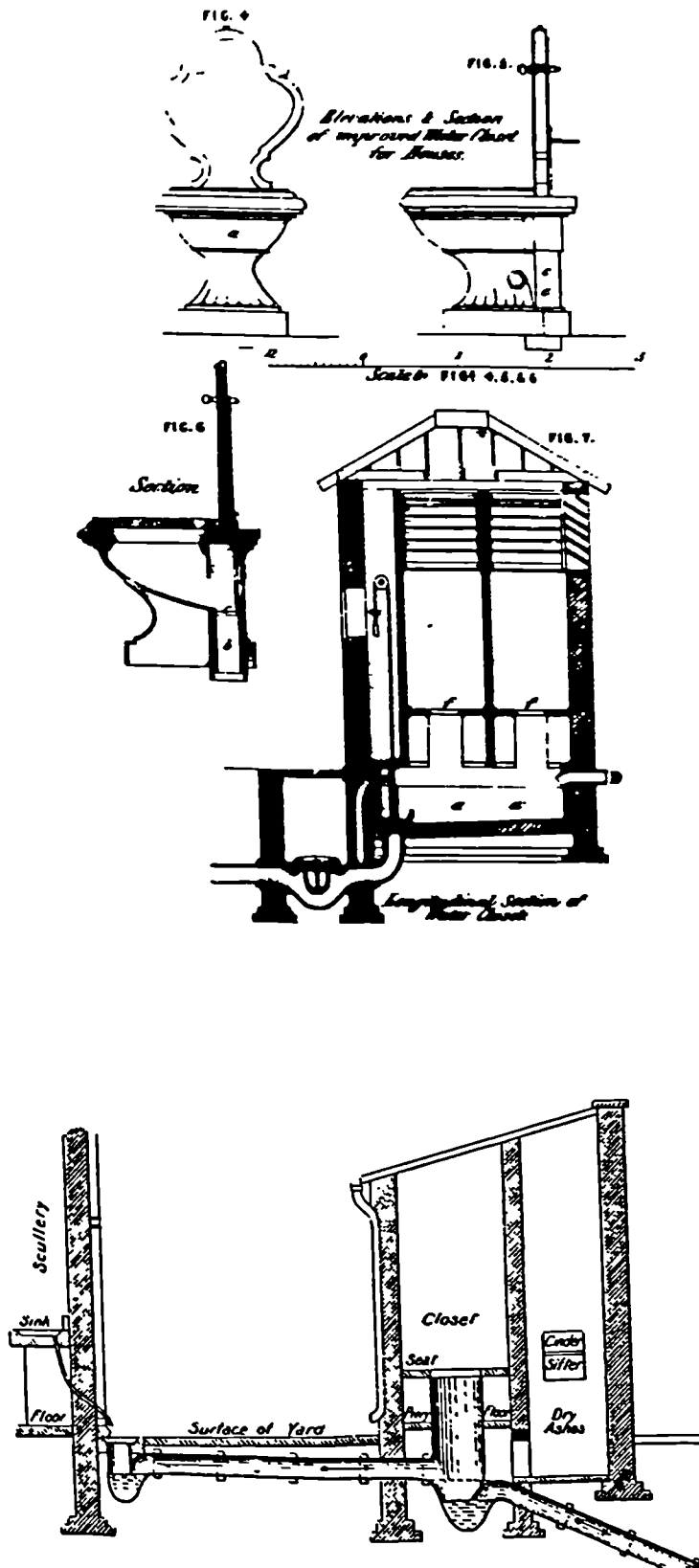




Figure 5.2 Newlands' Prototype Water Closets



realises its 'mistake' and converts to water closets by the end of the century. Belfast is basically a muddle, trying to respond to problems with drainage and water supply, but at the same time sensitive to the missives from the Local Government Board of Ireland which recommended pail closets:

as economical a mode of collection as any other, and one not involving under any circumstances a pollution of streams or well water, or any saturation of the soil (or air) with matters injurious to health.<sup>50</sup>

The issue of the efficient removal of excreta and rubbish is important to the public health in two main ways. First, the swift removal prevents the accumulation of large quantities, which if left uncovered will provide a breeding place for flies - the most common transmitter of disease. Secondly, if the excreta and rubbish are allowed to lie in the open, they will be carried into the houses on shoes, or when dried and in dust form, will be inhaled by city dwellers.

The two municipal services of refuse collection and street cleaning take on, therefore, great significance in the public health campaign. This of course did not become apparent to Chadwick and his contemporaries until the miasmatic theory of the spread of disease was surpassed by that of germ theory. However, the miasmatic theory prompted similar suggestions - that if sewage and refuse was removed from the urban environment quickly there would be nothing from which noxious gasses could emanate.

Each city managed these services in different ways, some using contractors to provide a minimal service, others using corporation employees. The chains of command are also interesting to investigate, and to some extent pre-determine the effectiveness of the services. Some were tied to the Health Committees, others to the Engineers' departments or the Highways Boards. These local variations, along with the basic sewerage networks amounted to total control of all the refuse in urban life. This theme is adopted by American Public Health researchers, such as Leavitt<sup>51</sup> and Tarr and Dupuy.<sup>52</sup> The success or failure of these services could thus have a massive impact on the mortality levels.

As with the introduction of water systems, the municipal authorities did not convert to pails, water closets and dustbins without full surveys of the problems and benefits of these new innovations. Corporation officials took these opportunities to make long tours of towns and cities in the British Isles and occasionally on the continent to see how their contemporaries were handling the problem of introducing

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<sup>50</sup> Local Government Board of Ireland Circular 22.12.1877 to all Irish Sanitary Authorities. This is cited in the Report on the High Death Rate in Belfast (1896)

<sup>51</sup> J.W. Leavitt and R.L. Numbers (eds.) *Sickness and Health in America* (Madison:Wisconsin University Press, 1985)

<sup>52</sup> J.A. Tarr and G. Dupuy (eds.) *Technology and the Rise of the Networked City in Europe and America* (Philadelphia:Temple University Press, 1988)

new technology. Undoubtedly these trips provided a useful method for the dissemination of knowledge, probably just as effective as missives from Chadwick.

As with most comparative studies, inevitably there is a wealth of information for one town but not for others. In this case it is Liverpool which has good archival sources which have survived. The conversion from privies to water closets occupied the time of the Health Committee of the Corporation and this is reflected in the official minutes and annual reports of the Borough Engineer. Liverpool's performance also is recorded as anecdotal evidence in the archives of other towns and in national enquiries. Glasgow to a lesser extent has preserved information on sewerage systems but unfortunately the style of the Police Board minutes (which was responsible for refuse removal) is not as detailed as the Corporation records. There is no data for Glasgow which shows the scale or the timing of the introduction of water closets, or why this was comparatively late. Belfast suffers most of all from its isolation from the rounds of official fact finding tours (which were usually confined to the mainland) and from the loss of many of the Corporation minute books and reports. It has not been possible therefore to make direct comparisons on all aspects of sewerage systems, and secondary sources have been used to overcome some of the limitations of the data, particularly in Glasgow and Belfast.

### **5.2.a. Glasgow**

According to Bell, water closets were introduced in Glasgow from the mid nineteenth century and were more common in this city than elsewhere in Britain. However, behind this generalisation lies a more complicated story about Glasgow's nineteenth century 'sanitary revolution'.

There is very little evidence for Glasgow on the subject of the conversion of privies to water closets. Extra details can be gained by inference from reports on the introduction of the sewer network, as described in section 5.1.a. As in Belfast, the installation of the mains network was very late (1890s) and thus any use of water closets before this time would not have been 100% efficient. Concurrent with the introduction of a sewer network, there has to exist an agency to effect the conversion programme. It is inconceivable that without some sort of organising force that individuals would install water closets. They would not have the knowledge (mainly disseminated through 'trade' journals for public health professionals and plumbers) and they would not be aware of the anticipated benefits from domestic sanitation such as reduced mortality and cleanliness. Therefore even though the inventions and technical knowledge were in circulation from the 1850s, one cannot include them in a town's 'chart of sanitary progress' until there is an agency to introduce them. The distinction must be made here between effective and nominal agencies. It is necessary to have a

high level of organisation and co-ordination with other municipal authorities, finance and power to impose the sanitary improvements. Thus, although Belfast had a Sanitary Committee from the 1840s, it was not until 1868 that it became a fully fledged operator in the sanitary reform movement.

In Glasgow this 'agency' was the Sanitary Department of the Police Board which was established in 1870. Prior to this there was a small department of 3 police officers who from 1864 acted under orders from the Inspector of Nuisances and the MOH. The Sanitary Department established in 1870 operated under section 20 of the 1866 Local Police Act which gave the new staff the power to abate nuisances. This staff consisted of 51:

- 1 chief sanitary inspector
- 5 superintending inspectors (one for each division)
- 5 lodging house inspectors
- 7 epidemic inspectors
- 18 nuisance inspectors
- 5 female inspectors
- 1 medical officer
- 5 district medical assistants 53

The Sanitary Department came under the jurisdiction of the Police Board of Glasgow which had been established by an Act in 1800 and was funded by a rate on the rental value of property. The Police Department therefore had from an early date in Glasgow responsibility for the cleansing, sewerage, paving and lighting of the city - organised into a Public Health and a Sanitary Department. The Police Board operated under its own Acts and rating system until 1895 when it was merged with the Corporation. At the time of the merger the staff of the Police Department numbered 1410.<sup>54</sup>

There was no definitive policy in Glasgow for the conversion of privies and pails to water closets. Only the Police Amendment Act of 1890 gives authority to compel property owners to provide:

adequate and suitable water closet accommodation, properly supplied with water, trapped and ventilated, to prevent leakage or effluvia therefrom. <sup>55</sup>

We must, therefore, investigate instead the operations of the Cleansing Department of the Police Board who were responsible for the removal of solid sewage for most of the nineteenth century. Bell documents the growing expenditure and manpower devoted to

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<sup>53</sup> D. M. Stevenson, *op.cit.*, p.234

<sup>54</sup> J. Bell, *op.cit.*, p.120

<sup>55</sup> Police Amendment Act 1890

this duty.<sup>56</sup> The department was re-organised in 1868 when the city was divided into 14 districts, each with its own hierarchy of cleansing staff. The department used 'rotary horse brushes' to sweep the city at night, with main thoroughfares being swept every night and the poorer districts being swept 'as needs required'. The 1868 re-organisation also involved the Cleansing Department assuming responsibility for the sweeping and hose-washing of courts, which was previously the responsibility of the owners.

From 1868 the Sanitary Department did initiate a conversion programme of privies to pails, thus following to some extent the Leicester model as described in section 5.2. These galvanised pails which were issued by the department were kept in 'pan closets' and emptied by the Cleansing Department, who also emptied the ashpits which received all the household refuse. Bell gives a good description of the system of pails, of which there were still 5475 in use in 1896:

The vehicles use for the removal of the pails are four wheeled covered vans. Each van is constructed to contain 30 pails, each of which is covered by a spring cover with a lining of India rubber tubing. These vans pass along the streets without the slightest effluvium being perceptible. On reaching the dispatch station the pails are uncovered one by one and emptied into a tank constructed specially for the reception of the excreta, and then washed in hot water, disinfected and replaced in the van, which is also hose washed and disinfected.<sup>57</sup>

The 'dung depots' of the mid nineteenth century were gradually abolished. As the privies were converted to water closets the amount of solid sewage decreased and refuse incinerators were built to handle the domestic refuse removed from ashpits. In 1896 manure was still collected and sold to farmers. The Police Board owned 890 railway waggons to transport the manure to the countryside.

The Cleansing Department of the Police Board also in 1879 took a 31 year lease on 98 acres of bog land at Fulwood Moss. They had the land drained and constructed a railway line to the site. Here they successfully grew hay and oats on the land treated with the sewage. Between 1892 and 1895 23,00 tons of refuse were deposited there and the profit from the agriculture was £287. Further land was bought in 1891 (565 acres) alongside the North Monkland branch of the North British Railway.<sup>58</sup> The only estimate of the number of water closets in Glasgow at any stage of the nineteenth century is given by Bateman and Bazalgette in their report on the main sewerage network in 1868. They only make a passing reference to the impact of water closets on their proposed drainage network, when they state that in 1868 it was calculated that of

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<sup>56</sup> J. Bell, *op.cit.*, p.166

<sup>57</sup> *Ibid.*, p.169

<sup>58</sup> *Ibid.*, p.171

Glasgow's 90,000 households, some 40,000 did not yet have water closets.<sup>59</sup> Their ideas on privy conversion seem out of line with the national contemporary campaign for rapid sanitary advancement:

If water closets were substituted for the present arrangements, the value of the material taken out of the city would be reduced, and the net cost of cleansing increased, while, on the other hand, the value of the sewage would be proportionately enhanced. It may be however, that that any change in this direction would be gradual and probably inadvisable; at any rate, we do not recommend any alteration in the system now pursued, as we have no doubt future details will accommodate themselves to the exigencies or convenience of the inhabitants, and be carried out more satisfactorily than they could be by any sudden radical change.<sup>60</sup>

Without more detailed information such as the excellent sources which exist for Liverpool, it is impossible to accurately chart the introduction of the water closet in Glasgow. However, as we know that it is impossible for the system to be effective without the associated sewer network, it is safe to say that the impact of any water closets installed before the 1890s was limited and cannot be viewed as full sanitary improvements.

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<sup>59</sup> J. Bateman and J.W. Bazalgette, *Report on the Sewerage of Glasgow* (Glasgow, 1868)

<sup>60</sup> *Ibid.*, p.30

### 5.2.b. Belfast

The introduction of the water closet in Belfast was late relative to its introduction in the other two cities. There were still only a few in 1888 - a century after their invention. This comparative delay was no doubt due in part to the inability of the Belfast Corporation to build a satisfactory sewerage system until the last decade of the century. Reports had been commissioned in the 1860s from Bateman and Bazalgette, but no action had been taken. The drainage and sewerage network finally reached a completed stage in 1893. Thus, without an adequate mains sewer network there was little point in insisting on widespread conversions of privies to water closets. Whitaker, the Medical Superintendent Officer of Health reported in 1892 that:

the most serious and difficult problem with which we have to deal is the removal and disposal of our sewage matter and house refuse. At present some 40% of houses in the city have the system of privy and ashpit combined in the small backyard, immediately contiguous to the rooms in which the inmates live and sleep. In thousands of cases there is no back passage or means of access to the yard for ingress or egress save through the house, and hence all the accumulated filth must be removed by carrying it through the kitchen. The removal of the matter causes a nuisance and when any infectious disease is prevalent, would be attended with great danger to the health of the inmates. The ashpit is generally uncovered and exposed to the rain, the bottom barely paved and no means of exit for the polluted water but evaporation into the air, or soakage into the earth to make its way under the foundations of houses, to be returned as noxious dampness for the walls and foul gasses to the inmates.<sup>61</sup>

As early as 1848 a Sanitary Committee in Belfast recognised the link between sewerage and mortality from fevers.<sup>62</sup> It stated that areas with sewerage had a 19% fever rate, whilst areas without sewerage had a rate of 70%. There is no indication in the text how these rates were calculated or to what they refer - mortality or morbidity - but they are interesting from a comparative perspective. At this time, however, the concern with sewers was because of the fear of the emanation of miasmatic gasses. The 1847 sanitary report recognises the value of human and animal excreta as manure which could be sold to farmers, but concludes that:

this sort of manure is seldom collected, and never in a separate state. In no town of which we are aware, is there any system put into operation

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<sup>61</sup> Report of Whitaker, Medical Superintendent Officer of Health 1892.

<sup>62</sup> Belfast Town Council, *Report on the Sanitary State of Belfast* (Belfast, Henderson: 1848)

for the collection of manure, it may therefore be safely alleged to be a matter of difficult realisation.<sup>63</sup>

They do however, mention the profits made by London and Manchester companies in supplying manure to the local farmers. The report makes a suggestion that the Police Commissioners should provide a more efficient scavenging force to remove sewerage and refuse, and:

we would suggest that, for the sake of decency and convenience, if from no higher motive, that those useful resorts designated *cabinets d'aisance* should be provided at several points in this town.<sup>64</sup>

The problem of the removal of excrement and refuse was exacerbated in Belfast by two factors. Firstly, there were regulations under the 1800 Act establishing the Commissioners and Committee of Police, which in section 39 prohibits the disposal of 'soil or filth from privies, necessaries or bog houses, into or upon streets lanes or other places in the said town of Belfast'. The Act also prohibits the transportation of such matter between the hours of 7 a.m. and 10 p.m.<sup>65</sup> Secondly, as stated by Malcolm, one of the first sanitary campaigners in Belfast, the majority of the working class houses in Belfast were 'back to backs' i.e. they had no back yards in which privies or cesspits could be located. Therefore all excreta and rubbish was placed on the unmade streets in front of the houses.<sup>66</sup>

The situation did not improve in the 1850s and 1860s. Bates' <sup>67</sup> erratic financial policies meant that provision of efficient sewerage and refuse removal services came very low on the list of priorities. Under the 1845 Improvement Act the Corporation did try to initiate a better refuse collection service - consisting of two carts which passed through the town three times a week - but rarely reached the poorer quarters. The Corporation followed a policy of paving and sewerage the streets, but no decision was made to convert the privies to water closets or pail closets. Attention was given to the abatement of nuisances. Between 1860 and 1864 the Sanitary Inspector and his two Sanitary Constables dealt with 5672 nuisances, ordered the whitewashing of 7263 houses, the cleansing of 1775 sewers and the removal of 327 pigs from houses.<sup>68</sup>

However, the Corporation did not establish a Sanitary Committee to co-ordinate activities in the town until 1865 - nearly 20 years after Liverpool's Health Committee. The new committee did not, however, mark a new phase in sanitary improvements. Its members made visits to Liverpool, Glasgow, Edinburgh and London to look at designs

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<sup>63</sup> *Ibid.*, p.20

<sup>64</sup> *Ibid.*, p.21

<sup>65</sup> Act to establish the Commissioners and Committee of Police in Belfast 1800.

<sup>66</sup> A.G. Malcolm, *The Sanitary State of Belfast* (Belfast, 1852)

<sup>67</sup> John Bates was the Conservative Town Clerk in Belfast who controlled all the corporation policy making bodies from 1842 till his downfall in 1854.

<sup>68</sup> Report of the Police Committee to the Corporation 1865



of slaughter houses, but in 1867 the Corporation cut spending again and two Sanitary Inspectors were dismissed.<sup>69</sup>

The two reports of Montgomery and Bazalgette make no mention of the introduction of water closets in Belfast. Their reports concentrate on how to remove sewage from the town and thereby reduce flooding, and they imply that solid sewage will make its way into the sewers by being washed down street gullies.<sup>70</sup>

Apart from the annual reports of the Medical Superintendent of Health (the counterpart of the English MOH) from the 1890s, there is very little evidence on the development of the sewerage systems within Belfast. There was a Sanitary Committee established in 1896 to hear evidence on the high death rate in the city - and the transcript of this investigation supplements the evidence from the MSOH reports. The problem with the 1896 report is that the Public Health Committee chairman, Alderman Graham, refused to give evidence to these 'farcical deliberations', suggesting that the committee hearing evidence was not independent, but only there to condemn the Public Health Committee for lack of action. This, therefore, somewhat dulls the information which we are given, and only the most certain of facts can be used.

In 1896 the Public Health Department had a staff of an Executive Sanitary Officer (Conway Scott) the MSOH (Whitaker) two chief officers and 15 inspectors. Belfast was divided into 8 sanitary districts, plus Ballymacarrett, with an inspector assigned to each district, and individual inspectors for food and drugs, dairies, workshops and two for disinfecting. These inspectors made systematic house to house inspections, and were all convinced of the link between the high death rate and the primitive privy and ashpit system.<sup>71</sup> In the Cleansing Department there was one superintendent and a staff of 130. In 1895 there was a change of policy, whereby refuse was put into carts in the backyards, rather than being dumped on the streets to await collection. Ashpits and privies were theoretically now emptied every week, and disinfectant put on the excreta before it was carried through the house. In 1894 Conway Scott recommended that all the old style middens be lined with concrete and covered, but this was not adopted as it was considered to be outside his jurisdiction. When the committee suggested to Scott that:

'Mr Scott is an independent officer of the Corporation, and no committee has any control over him'

he replied that:

'Oh yes, they have. They can stop my salary.'<sup>72</sup>

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<sup>69</sup> G. Slater, *Belfast Politics 1798 - 1868* ( unpub. D.Phil thesis, Ulster University, 1982) p.290

<sup>70</sup> J.J. Montgomery and J.W. Bazalgette, *Report on the Drainage of the Borough of Belfast* (Belfast; Baird, 1867)

<sup>71</sup> Belfast Corporation, *Report on the High Death Rate in Belfast* (Belfast, 1896) p.6

<sup>72</sup> *Ibid.*, p.9

Scott had suggested that all houses in the city be converted to the water closet system, at a cost of £4 per new drain to each house, and a sewage treatment plant at the lough costing £9,000 to £10,000 to operate. This was rejected, but Scott had managed to achieve in 1890 a restriction on houses being built without water closets.

In 1896, the main method of solid sewage removal in Belfast was still to take it in carts to the railway station and leave it there in heaps, sometimes for months, till the railway took it to the farmers. The Corporation received 6d per ton for the sewage, so it considered this a cost effective method of sewage removal.

The delimitation of duties in municipal Belfast was at the root of some of the sanitary problems in 1896. The Public Health Department had control over houses when constructed, and only the MSOH could declare them unfit for habitation. The Improvement Committee were in charge of the sewer system and house construction. They had to get a certificate from the MSOH to say if the filled in land (using contents of ashpits and middens) was safe to build on. The MSOH could be overruled by the magistrates concerning uninhabitable property, and also by the Public Health Committee who did not have to adopt his recommendations. Since 1894 the MSOH had had permission from the Improvement Committee to inspect the foundations of new houses, but still could not inspect the drains and sewers which was the domain of the Surveyor as they lie under the streets.

When the Assistant Surveyor was questioned at the enquiry, it became clear that the Surveyors department had little control over the process of sewer building, or knowledge of existing sewers in Belfast. There was no communication between the surveyor who was responsible for checking the construction of the house sewer, and the contractor, who built the road sewer.<sup>73</sup> The connection of the house drain to the road sewer was the responsibility of the Building Inspector of the Improvement Committee, who should have inspected it before the house was occupied. The Improvement Committee had also been known to pass plans for houses, where the Surveyor's department had not passed plans for sewerage and paving.<sup>74</sup> There were no building bye-laws before 1890, although this power had been given to the Corporation under the 1878 Public Health Ireland Act. Regulation of buildings prior to 1890 was therefore done using Local Act clauses.<sup>75</sup>

In 1896, at the time of making the report, all the sewage to the north of the railway line still flowed into one enormous cesspool, and the water from here flowed

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<sup>73</sup> *Ibid.*, p.76

<sup>74</sup> *Ibid.*, p.89

<sup>75</sup> The existence of bye-laws and the use of them are two different issues. Historians who have focused on the development of building regulations, such as M.J. Daunton, *House and Home in the Victorian City*, and S.D. Chapman (ed.), *The History of Working Class Housing* (Newton Abbot, 1978) have highlighted how bye-laws could be effectively ignored by the more influential members of the local community, especially if they had representation on the council through which they could suggest that their developments were to the ultimate benefit of the town.

out over fields behind Spike Island where cows were grazed. The River Blackstaff was still in the 1890s a virtual open sewer - receiving all kinds of sewage and refuse.

The Corporation continued to act under the authority of the 1878 Public Health Act even after the passing of the 1890 Public Health Act. The sanitary officers acted as medical officers, under regulation by the Local Government Board, and although the sanitary officers questioned during the enquiry were aware that privies and middens were a cause of high mortality, along with infected milk, they could do nothing to alter the situation, and could not prosecute under the Infectious Diseases Notification Act which had not been adopted in Belfast. The Corporation had powers to insist on the conversion of privies to water closets but did not use them, and would not even contemplate a half-measure such as Rochdale's pail system, which involved the municipal authorities supplying metal pails to each house which were placed under wooden seats, and removed for emptying on a regular basis in specially designed carts.<sup>76</sup> Whereas in Liverpool the Corporation had taken over responsibility for the emptying of privies and middens under the 1847 Act, in Belfast the owners were allowed to decide when and how to empty them till 1894. The Improvement Committee continued to allow people to make ashpits without covers or doors even after the 1878 Act. Section 25 of the 1890 Act which prohibited the construction of houses on land infilled with ashpit cleansings was also being flouted in Belfast. The Public Health Committee seemed to be of the opinion that if the ground was left to stand for long enough the rubbish would lose its offensive smell and become 'safe'. Perhaps if it could be guaranteed that only *ashpit* cleansings were used for infill, it would be suitable for building on, but in Belfast privies and ashpits were emptied at the same time into the same carts. Thus in some parts of the city, for example Ritchie's Ground, houses were being built on human and animal excrement.

Whitaker's evidence to the enquiry is most enlightening. He cites a case of a 10 x 5 ft yard in Percy Street where he found 60 pigs and 30 cows - with no paving or drainage - so the animals' sewage seeped under the walls and into houses.<sup>77</sup> In February 1892 the Corporation made a decided effort to improve the sewerage system in Belfast. £10,000 was given to the Public Health Committee to pay for the more frequent removal of privy and ashpit cleansings from small houses - but the Corporation still refused to have insanitary dwellings closed, which they could authorise under the 1890 Housing of the Working Classes Act.

A typical description of a court property in Belfast at the end of the nineteenth century is thus:

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<sup>76</sup> *Ibid.*, p.132

<sup>77</sup> *Ibid.*, p.211

there is a midden/common privy in the centre - less than 9 ft from the doors to the houses. No door or seat on the privy - it is open to the street. The sewage from this common midden goes into Durham Street along a surface channel, 5 inches wide, in front of house doors. As there are no door steps, the liquid runs into the houses sometimes. The occupants have never seen the Sanitary Inspector.<sup>78</sup>

The enquiry in 1896 recognised that the anticipated reduction in zymotic mortality (which should have happened when the main sewer network was completed in 1894) had not happened. They at last realised that a sewer network alone would have little impact unless the privy system was abolished. Why it took Belfast nearly 40 years longer than Liverpool to come to this conclusion is not clear. Lack of co-ordination and apathy on the Corporation's part seem to be partly to blame. By 1900 approximately 40% of Belfast still relied on privies and cesspits, or if water closets were used, they tended to be the old fashioned type, with taps leading directly from the pans to the water mains.

### 5.2.c. Liverpool

In the first half of the nineteenth century Liverpool's cesspits-middens had achieved national notoriety. They were large, foul and worked into an elaborate network of underground tunnels. Some were so large that they contained up to 225 tons of human and animal excreta, ashes and household refuse. Frequently this had to be carried through houses when they were emptied, as houses often had no rear entries.<sup>79</sup> Liverpool Corporation gained the power under the Sanitary Amendment Act of 1854<sup>80</sup> to force the conversion of privies / cesspits into water closets, if the MOH certified them to be 'in a situation and condition as to be injurious or prejudicial to health.' The conversion from privies to water closets began in Liverpool in 1863 and was completed by the 1890s. There was a break from 1870 to 1875 which will be discussed later. All the Liverpool historians - Reeve, White, Bate, Hope and Taylor - have dealt with the political side of the conversion campaign, and the technical improvements made. Very little can be said, however, about how the innovations were perceived by the working classes, and the speed with which they changed their sanitary habits to accommodate the new facilities.

The introduction of water closets seems to have been spatially biased towards the wealthier districts at first, with the conversion of dwellings in the courts coming

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<sup>78</sup> *Ibid.*, p.252

<sup>79</sup> Report of the Medical Officer of Health on the Present Midden System 19.11.1863.

<sup>80</sup> An Act for the Improvement of the Sewerage and Drainage and for the Sanitary Regulation of the Borough of Liverpool 9+10 Vict c.127. The relevant sections to the conversion programme are 82 and 83.

last. Details given in the Council proceedings in 1868<sup>81</sup> indicate that of the 3,212 courts 55% of them were served by middens, 36% by trough water closets and only 9% by true water closets. The Corporation prevented the construction of houses with privies from 1860. Reeve estimates that from 1863 to 1870 (when the conversion programme was halted) 15,504 privies had been converted into water closets. The MOH reports give details on conversions, and their locations in the town.<sup>82</sup>

Table 5.1 Conversion of Privies to Water Closets in Liverpool

Year	Number of Conversions
1863-65	750
1866-68	3978
1869-71	924
1872-74	125
1875-77	984
1878-80	2118
1881-83	2710
1884-86	1844
1887-89	89

The installation of trough water closets in court housing was however, not as effective from a sanitary point of view as the true water closets which had a constant supply of water from a cistern. A modified version of this was where a tap led directly to the pan and operated from the water system. The classic definition of the water closet is based on the direct and immediate removal of excreta by 'wash down'. In trough water closets water filled a tank to a depth of 1 ft and over this there was a seating platform. The trough would be emptied nightly by a 'nightman who would remove the plug from the bottom of the tank, flush it out by turning on the tap, and re-fill the tank and add carbolic. In theory it was an efficient use of water, but the demands made on it (up to 40 people per day) and the exposure of the sewage to insects removed some of the trough water closet's hygienic possibilities. The trough water closets were abolished along with the courts they served, and apart from in Liverpool, they were never very common in Britain. by 1905 there were only 1459 left in Liverpool.<sup>83</sup> The way in which the water closets were used changed gradually during the nineteenth century. In 1888 Nevins makes the first mention of the use of toilet paper. There was

<sup>81</sup>Council Proceedings 1968 p.553 Appendix D. Report of the Sub - Committee on the conversion of privies into water closets.

<sup>82</sup> Annual Reports of the Medical Officer of Health 1863 - 1870.

<sup>83</sup> Annual Report of the MOH 1902

also reluctance in the poorer districts to using water closets directly and up until the end of the century some families were using vessels in houses and emptying then on a weekly basis into the water closets.<sup>84</sup> The MOH reports also gave details from the 1870s on the number of water closets found to be dirty during inspections. Reeve calculates that from 1877 till the 1890s the MOH's department was doing up to 120,000 inspections a year. Pooley and Irish suggest that the maintenance of the number of dirty water closets in the courts was due to the population mobility, and possibly from 1884 a direct Corporation policy of moving the poor into 'improved' courts with water closets to introduce them to new sanitary ways before moving them out to new suburbs such as Everton<sup>85</sup>

The temptation to make a direct correlation between the introduction of water closets and the reduction in mortality must be resisted. The enthusiasts for the sanitary explanation of the nineteenth century mortality decline have searched without joy for the elusive statistical correlation. Woods attempted it for Birmingham, by using a product moment correlation technique to establish a relationship between mortality and a range of sanitary variables (percentage back houses and location quotients for water closets, pan privies, ashpit privies) but did not find any positive evidence. He tentatively suggests that the location of death was increasingly becoming the hospital, thus removing the direct relationship, and that poverty in the new courts of the outer wards would not illustrate a sanitary correlation.<sup>86</sup> Reeve even suggests that a well maintained privy was a better sanitary option than a rudimentary trough water closet. He cites the Liverpool case of Everton which had privies till the 1880s and had a lower mortality rate than Scotland Road ward which had trough water closets. He does not consider that the introduction of water closet was only part a package of sanitary reforms, in which the importance of the individual elements could vary from place to place.<sup>87</sup> Reeve does however, direct attention to the poor design of the early water closets - where water mains supply led directly into the pan and therefore providing a route for contamination.<sup>88</sup> This style was not abolished till the 1870s following the Corporation's regulations for plumbing fitments in 1872.

In Liverpool, as elsewhere during the mid nineteenth century, middens and cesspools were seen as valuable items by their 'creators'. The nightmen who emptied them paid generously for the contents which they could sell to the local farmers. The development of the water closet system and the complimentary authority the Corporation exercised in respect of this was therefore seen by some as another method

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<sup>84</sup> *Ibid.*, 1899 p.183

<sup>85</sup> *Ibid.*, 1898 p.92

<sup>86</sup> R.I. Woods, 'Mortality and Sanitary Conditions in the Best Governed City in the World; Birmingham 1870-1910' *Journal of Historical Geography* (1978) p.35-56

<sup>87</sup> P. Reeve *op.cit.* p.105

<sup>88</sup> Porcupine (17) 8.5.1875, 15.5.1875

of attack on private property, and the rights of individuals to store and sell their own sewage and refuse. Bate charts the reversal of the *status quo* in Liverpool following the 1842 Health of the Town Act, which forced occupiers to pay for their middens / cesspools to be emptied when demanded by the local authority.<sup>89</sup> He suggests that the intolerable stench that resulted from the breakdown of the system of independent 'nightmen' had as much to do with the pioneering Liverpool Sanitary Act of 1846 as the long distance missives from Chadwick.

Thus the system which prevailed in the late 1840s at the time when the local government organisation was restructured was one of 'emptied when full' at the request of the owners to the Department of Nuisances rather than a system of regular collection intervals. This system of owner notification was weak, and so the Inspector of Nuisances requested that the police and scavengers who operated within his department should make inspections of middens and notify him when they needed emptying. Of the estimated 55,217 middens in existence in 1850 11,637 of them were emptied through the channel of police / scavenger identification rather than owner notification. This to some extent represented the failure of the occupants of the courts to accept 'communal' responsibility for the state of their middens.<sup>90</sup> The received requests for emptying were written onto dockets and given three numbers - relating to the contractors' district (7) the police section (16) and the parish or township (5).<sup>91</sup> Liverpool Corporation gave the whole business of the collection of the midden contents and their disposal to contractors, who provided a poor service. Newlands did suggest that the Corporation should extend its workforce and do these jobs directly but this idea was not adopted.<sup>92</sup> There were problems with the use of sub-contractors, the speculative emptying of the middens only if they contained manure of the best quality and the storage of manure within the town for long periods.<sup>93</sup> 1849 saw an unprecedented number of complaints about the contractors and the 'monster nuisances' they were creating at their collection points. The service continued to decline through the 1850s and to 1864. The Health Committee were particularly concerned during epidemic disease periods in 1853, 1854 and 1855, when the contractors ignored their requests to remove refuse from the infected districts more frequently.<sup>94</sup>

In 1862 the Corporation took over responsibility for the cleaning of the surfaces in the courts to reduce the mess left by the midden emptiers. The whole question of the

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<sup>89</sup> W. Bate, *Sanitary Administration of Liverpool 1847 - 1900* (Liverpool University, Unpublished M.a.Thesis 1955)

<sup>90</sup> Report of MOH on the Present Midden System 1863.

<sup>91</sup> W. Bate *op cit.*, p.83

<sup>92</sup> Health Committee Minutes March 1847 p.254

<sup>93</sup> This preference for "good" manure meant paradoxically that the contractors avoided the best districts, such as Rodney Street and Abercromby Square because their middens did not contain animal excrement. The refuse from the courts was more "saleable" to the farmers.

<sup>94</sup> Health Committee Minutes 7.12.1854. 19.10.1854. 20.3.1855.

removal of refuse from the town was considered in 1865 when the Corporation sent representatives to Manchester to see the system in operation there. The deficiencies of the various sewerage systems in Liverpool came under the control of the Nuisance Department and thus from 1847 onwards the emphasis of the work was on the correction of 'evils' rather than on the introduction of new methods and preventative work. The Nuisance Department was also constrained by the boundaries of its jurisdiction to operating in the 'public' arena. It had no power relating to sanitary defects within the domestic environment. Therefore the time of the Nuisance Inspectors was taken up with:

cesspools leaking into houses, offensive accumulations of manure, overflowing middens, middens requiring drainage, choked sewers, uncleaned passages, stagnant water, the keeping of pigs or other animals and nuisances due to smoke from factories and steam boats.<sup>95</sup>

The Inspector of Nuisances also worked closely with the MOH in the execution of its only internal duty - the whitewashing of houses classed by the MOH as infected. The development of the system of routine inspection began from this early connection of disease and dirt, and by 1850 the Nuisance Department was making inspections of over 55,000 court houses per year resulting in 2,228 limewashing notices being served on the owners (not the occupiers) of the properties. Notice serving was not efficient in promoting action and in times of disease epidemics the MOH's department resorted to doing the work itself and trying to recover the cost later from the house owners, but this was not always successful.

The transformation from privies to water closets thus reduced the role of the Inspector of Nuisances department as it removed the main burden of the work of identifying the nuisances, and it removed the need to have so many 'nightmen' to remove the mixture of sewage and household refuse from the town. The effort to implement the conversion programme was however, not the responsibility of the Inspector of Nuisances, but the Borough Engineer who throughout the nineteenth century acted in an advisory and decision making capacity. The Borough Engineer did not think that the conversion programme would put any undue strain on the water system. He estimated that in 1866 the water closets used in a year the amount of water that was used in total in one day by the town.<sup>96</sup> The opposition to the conversion plan was therefore based on the old property question rather than a concern for the synchronisation of the water and sewerage systems. There was also the question of the cost of the conversions. The Corporation initially refused to bear any of the cost but in 1867 it indirectly paid - through its financing of court improvements under the 1864

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<sup>95</sup> Inspector of Nuisances Report by T. Fresh 1847-51.

<sup>96</sup> Report of the Borough Engineer 1866



Sanitary Amendment Act. The MOH met opposition immediately, when in January 1864 he submitted his list of 170 privy blocks for conversion but the council rejected it.<sup>97</sup> There seemed to be genuine fear that the water closet would lead to a rise in mortality, and a continued belief in the safety of the dry ash closet. This was certainly the view held by Alderman Bennett, backed by the *Liverpool Mercury* - but his view was not influential enough to overcome the findings of the sub-committee on the mortality of the town.<sup>98</sup>

The MOH continued to stress in his annual reports the explicit link between mortality from fevers and the insanitary practices of the use of middens and privies. In 1868 the number of conversions rose as a result of outbreaks of typhoid in Everton, Kirkdale, West Derby and Scotland Road wards.<sup>99</sup> Thus by 1869 12,668 of the estimated 35,000 privies in Liverpool had been converted to water closets - at last making full use of Newland's new sewerage network.

The halt of conversions in 1870 was due to a dispute between the Health Committee and the Medical Officer of Health. The Health Committee tried to impose a limit on the MOH's authority by refusing to automatically sanction his certificates of privies needing conversion. The MOH (Trench) went directly to the Council and issued a report on the scientific reasoning behind the condemnation of privies and middens. However, the Health Committee were not convinced and in 1871 asked Drs. Parkes and Sanderson to include an investigation of privy conversions in their report on the sanitary state of the town. They declared that the privy / midden system was 'barbarous' - but the Health Committee did not hurry its return to the conversion programme, which only resumed properly in 1877.

The motivation of the Health Committee in opposing the MOH's suggestions seems out of character with its generally progressive nature. There are two possible explanations for their actions. Firstly, the committee was being manipulated by the property interests in the town who wanted to resist the implementation of the legislation concerning sanitary improvements because of the cost. Secondly, there could have been some internal Corporation agreement with the Water Committee to delay the conversion of privies so as to fit in with their plans, but there is no direct evidence for this. The water situation in Liverpool at this time was suffering a crisis due to the lack of water from Rivington and the continued expansion of the town. A waste water campaign had been initiated (1873-1876) and there had not been a constant water supply since the early 1860s. It would have put extra pressure on the already stretched water supply if a large number of water closets had been created in the town during this period. Bate

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<sup>97</sup>Council Proceedings 20.1.1864.

<sup>98</sup>Report on the Excessive Mortality in Liverpool, 1872

<sup>99</sup>Annual Report of the MOH 1868

notices that the resumption of the conversion programme mirrors precisely the return to the constant water supply in 1877.<sup>100</sup>

To summarise, by the end of the century in Liverpool, over 35,000 privies had been abolished, and most properties had water closets. These were connected to an extended version of the skeleton sewerage network which Newlands had installed in the 1850s and 1860s. Because all the liquid and solid sewage was now being removed in water suspension the amount of refuse that had to be removed by the corporation 'scavengers' had been dramatically reduced to mainly household rubbish. A new system of 'Binmen' was introduced, with weekly collections of rubbish which was stored in corporation issue 'bins'. Therefore, by the end of the century there was very little opportunity for refuse and sewage to contaminate the urban environment.

### 5.3 Conclusion

By delaying the installation of a sewer and drainage network, the corporations would effectively save money on obsolescent schemes. However, there would also be a corresponding increase in the threat of mortality from 'dirty' diseases. The evidence from the American cities for the nineteenth century would suggest that the Civil Engineers provided information on the new advances in the provision of water and sewerage systems, and that the corporations would decide on the timing of the new systems according to what neighbouring cities chose to do, and the availability of finance for the schemes

Competent, imaginative engineers, formally trained or not, were relatively rare, at least until the end of the civil war, and widespread consulting activity on their part was not unusual. It was in this manner that the diffusion of their talents was accomplished, even though their numbers were relatively small.<sup>101</sup>

It is not clear either from the European or American evidence whether the urban authorities consciously weighed up the mortality premium they would pay by deliberately delaying the introduction of a new sewerage system. The evidence provided by the public health professionals must however, surely have made them aware of this possibility. The timing of the introduction of the sewerage system is not just determined by the available technology and adequate capital. Sewerage systems were not seen as optional extras in the urban environment, and they were not always undertaken voluntarily. Compulsive adoption of sanitary schemes was sometimes necessary. Early installation of a sewer/drainage network might indicate that a city had

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<sup>100</sup>W. Bate *op.cit.*, p.171.

<sup>101</sup> L. Anderson, 'Fire and Disease: The Development of Water Supply Systems in New England, 1870-1900' in J.A. Tarr and G. Dupuy (eds) *op.cit.* p.149

stronger links with central government, which overrode the impact of local decision makers. This could be due to the influence of policy makers like Chadwick who were pushing the 'integrated system' in the 1850s and 1860s.

The applicability of agro - sewage systems (and therefore of Chadwick's integrated system) are limited in coastal towns, as they have the option of disposing the sewage in the sea. Thus this study does not consider the full range of sewerage problems which must have arisen during the period of rapid urbanisation. The option of using the sewage was therefore one of choice for the three cities, not one of compulsion. The fact that they did consider the use of sewage on local farmland, lends credence to the idea that sanitary change was seen as a many - faceted ideal, to be adopted as a whole where possible. This is clearly shown by the attitude of Liverpool's engineer, Newlands, who presented to the Corporation in 1848 his integrated model for the urban environment, which encompassed not only the traditional concerns of the Borough Engineer (water, sewers, paving) but also the design of houses, the density of population and the importance of open spaces:

A spacious promenade with a carriage road carried round the town nearly on the Boundary line of the Borough, with roads and streets radiating to it would be accessible alike from all parts of the town....At once could the labourer, immured all day in the town, emerge from its smoke and bustle and noise, and with his family enjoy his evening walk amongst the beauties of nature, and be invigorated by the pure air of heaven. such enjoyments would empty the ale benches, and elevate the moral condition of the people. <sup>102</sup>

It is, however, necessary to recognise the particular problems which Belfast experiences with drainage, which would have prevented the adoption of ready made sanitary solutions. Belfast in particular was constrained in the choice and speed of its sanitary schemes because it is the lowest and the flattest of the three cities. Its unique topography meant that the sewer/drainage system was more likely to fail, and that the cost would be higher than in 'easier' towns like Liverpool.

The introduction of water closets must be *efficient* and *sufficient*. i.e. they must be the most hygienic models, and installed in all of the urban dwellings. A partial introduction policy will not result in a public health benefit through improved mortality rates. If the urban authorities decide to implement a water closet conversion programme, they must be assured of a constant water supply system. Contemporary commentators recognised that a water closet with an inadequate water supply to flush it was more of a sanitary hazard than a well maintained privy.

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<sup>102</sup> J. Newlands, Report of the Borough Engineer, 1848 (Liverpool Corporation, 1848) p.112

Glasgow's choice of pail closets rather than water closets is illogical and difficult to explain, given their exemplary performance on the provision of water. It is possible that they were swayed by the ideas of Bateman, or concerned over the development of the sewer network, but it is unlikely that they saw the pail closet as the ultimate in desirable systems, as Wilson unconvincingly suggests that Manchester did.<sup>103</sup>

### *Implications for Mortality Trends*

The expected effect on mortality from what we know about the sanitary systems of the three cities can be summarised as follows. Liverpool followed the 'model' programme of water and sewerage systems and the introduction of water closets at an early stage in the nineteenth century, but because of the failure of the water system to supply sufficient water, it is to be expected that the mortality rate from 'dirty' diseases would continue until the water supply improved (i.e. the late 1890s) It is only after this date that the water closets can be classed as a sanitary improvement. Therefore no improvement to the public health should be expected.

Belfast was very late in putting in public and domestic sanitary systems. Although the water supply improved from the 1870s, there was no drainage network until the end of the century and the introduction of water closets was limited. As with Liverpool, there can be no expectations of mortality improvement until a more integrated sanitary system was working in the city. The particular drainage problems which the city had should be evident in higher mortality from water-borne diseases.

Glasgow should show the most improvement in mortality for the second half of the nineteenth century. There was a surplus of water from the 1860s, which should have promoted domestic hygiene. However, the water was not used effectively, as Glasgow was comparatively late in introducing a drainage system and water closets. The pail closets do seem to have been a useful sanitary improvement on the privy middens, but only when they were removed for emptying frequently and thoroughly disinfected. Therefore the change from pail closets to water closets may not have initiated a decline in mortality on the scale we usually expect with sanitary improvements.

How do these predictions fit the actual demographic experiences of the three cities? Chapter three highlighted the relatively slow fall in fever mortality rates in Belfast in particular. The stabilisation of the crude mortality rate through the 1880s and 1890s suggests that the city suffered from the delay in the introduction of an integrated sewerage system. Liverpool suffered from problems with the quantity of water available

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<sup>103</sup> A. Wilson, *Technology and Municipal Decision Making: Sanitary Systems in Manchester 1868-1910* (Unpub. Ph.D. Thesis, Manchester, 1990)

which undermined the effectiveness of the sewerage system throughout the century. This is reflected most clearly in the pattern of diarrhoeal mortality which fails to decrease in the 1890s even after the privy conversion programme had been completed. Glasgow's early introduction of water from Loch Katrine undoubtedly did much to improve the sanitary situation in the city, and efficiently complemented the pail system for sewerage removal until the 1890s.

## Chapter Six

### Secondary Sanitary Improvements

#### 6.1 Justification for Intervention

The common secondary sanitary improvements in the second half of the nineteenth century included the introduction of public baths and wash-houses, the development of medical services - either in the form of hospitals to remove the infectious people from the urban environment, or the provision of domestic visitors, who played a more preventative role in health care. Adequate control over possible insanitary areas was also vital to the ultimate aim of a 'healthy city' and this argument sanctioned the municipal control of abattoirs and markets, and intervention in housing policy and education facilities.

The explanation for the choice of public baths and wash-houses (rather than hospitals, or health visitors) as an example of secondary sanitation centres on the additional 'roles' which this service could adopt within the urban environment. Specifically, the development of initially a sanitary service into a municipal trading activity. By focussing on the public baths and wash-houses, we are provided with an opportunity to see whether or how the authorities exploited municipal functions for ulterior motives, namely profit, and whether this long-term goal coloured their decision making at formative stages in the sanitary reform of their cities.

The municipal authorities were implicitly concerned with controlling the lives of the 'dangerous classes', and the sanitation argument provided an unparalleled justification for observation and intervention. The poor were stereotyped as a 'smelly' group by most nineteenth century commentators, probably with good cause. Wohl recites the description given by the MOH for Whitechapel of the poor washing their clothing

They merely pass dirty linen through very dirty water. The smell of the linen itself, when so washed, is very offensive, and must have an injurious effect on the health of the occupants. The filth of their dwellings is excessive, so is their personal filth. When they attend my surgery, I am always obliged to have the door open. When I am coming downstairs from the parlour, I know at a distance of a flight of stairs whether there are any poor patients in the surgery.<sup>1</sup>

On some occasions private individuals and charitable concerns pre-empted the sanitary initiatives of the municipal authorities, and the motivation for this needs to be fully

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<sup>1</sup> A. Wohl, *Endangered Lives* (London: Dcnt, 1983) p.64

investigated. The financing of the secondary sanitary projects was also a contentious matter.<sup>2</sup> Municipal funding was primarily concerned with providing large scale systems for water supply and sewerage removal. These schemes on their own often brought the corporations to the point of insolvency, and any additional projects were likely to be agreed upon on the understanding that they were to be self-financing or possibly profit-generating for the municipal authority. The debates over the financing of secondary sanitary schemes may reveal, therefore, an explicit understanding that some schemes were more likely to produce a healthier environment than others, and that they could get 'more saved lives for their money'.

The introduction of baths and wash-houses was aided by the Public Baths and Wash-houses Acts of 1846 and 1847.<sup>3</sup> The 1846 Act was introduced by Sir G. Grey, but the main case for the Bill came in the House of Lords from the Bishop of London.<sup>4</sup> He made several statements about cleanliness: 'that subject nearly concerned the moral as well as physical welfare of the humbler classes of population', 'that overcrowding and want of cleanliness caused an aggravation of the general type of disease in the metropolis'. He presented several petitions, from the Committee for promoting the establishment of Baths and Wash-houses for the labouring classes, from bankers and merchants of the city of London, from the chairman of the London Dock Company, from the churchwardens, overseers and guardians of the parish of St. Martin in the Fields, and one from 121 of the parochial clergy of London. He cited the Liverpool establishment as an example of a profitable undertaking, and this was followed up by the Marquis of Lansdowne on the second reading of the Bill in the House of Lords,

for thanks to the great influence of individuals - thanks to that spirit of enterprise which in the great cities of this country was perpetually directed to the attainment of great public objects connected with the interests of the poor, there were now existing in England, established in the course of the last year, three if not four, of these great establishments; two had been erected in London....and there was also a considerable establishment of the same description in the great town of Liverpool. <sup>5</sup>

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<sup>2</sup> However, there is only one Parliamentary Report into the Provision of Baths and Wash-houses : Sel. Committee. on Coms. of the City of London (Baths and Wash-houses) Bill Rep., Procs. 1895 (112) VII.483. A summary of the national position can be gained from: Return of Places where Baths and Wash-houses Acts have been adopted 1865 (383) XLVII.279

<sup>3</sup> An Act to encourage the establishment of public baths and wash-houses 9&10 Vic.L.c.74 (1846). This was modified the following year by an Act to Amend the Act for the establishment of public baths and wash-houses 10&11 Vict c.61. (1847)

<sup>4</sup> Hansard LXXXVII (4.6.1846 - 24.7.1846) p.104

<sup>5</sup> Hansard LXXXVIII (27.7.1846 - 28.8.1846) p.278

It was stressed that the aim of the Bill was not to put existing private baths out of business, but to stimulate private enterprise, while at the same time enabling corporations and vestries to establish baths,

that should make them on the one hand accessible to the poor, and on the other hand remunerative to the town and parish in which they were established.<sup>6</sup>

The only doubts that were expressed over the Bill came from Lord Beaumont, who thought that the establishment of baths and wash-houses might promote jobbing, as it would enable vestries to appoint paid servants. Throughout the limited discussion on the Bill the assumption that the baths and wash-houses would be self-supporting, if not profit making, held fast. It was never seen as an increase in the burden on the municipal pocket.

Public baths did exist in the late eighteenth and early nineteenth centuries, but they were seen primarily as cultural activities, not as public health services. The 1844 Royal Commission into the Sanitary State of Large Towns and Populous Districts found that no public baths cost less than 6d. and that there were no municipally owned wash-houses. Thus the opportunities for the working classes to cleanse themselves and their clothing were limited to what they could achieve within the overcrowded conditions of their houses. An outcome of the Commission was the creation of the Association for the Establishment of Baths and Wash-houses for the Labouring Poor. Although it was a pressure group rather than an active constructor, the Association managed to open a public bath-house at St. Pancras in 1846. Two Baths and Wash-houses Acts were passed in 1846 and 1847 which provided the municipal corporation with the necessary legislation to start construction in their towns. However, the rate of introduction was slow, and some large towns like Manchester and Sheffield still did not have municipal baths in 1865.<sup>7</sup> By the end of the period the situation was improved. In 1912, there were over 5,000,000 visits made annually to public baths (over 3,000,000 of these were in London).<sup>8</sup>

The municipal involvement in schemes such as baths and wash-houses towards the end of the century brings into the debate the whole 'municipal trading' ethos. This issue has been addressed in chapter four (water supply), but it is worth re-iterating here the way in which borderline sanitary and municipal schemes touch on the ethics of competing with urban businesses. Kellet and Falkus<sup>9</sup> stress that there was a very fine dividing line between those enterprises which served the urban community and those

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<sup>6</sup> *Ibid.*, p.278

<sup>7</sup> PP XLVII (1865) *Return Relating to Baths and Wash-houses*. pp.1-5.

<sup>8</sup> A.S. Wohl, *Endangered Lives: public health in Victorian Britain* (London: Dent, 1983) p.75.

<sup>9</sup> J.R. Kellet, 'Municipal Socialism, Enterprise and Trading in the Victorian City' *Urban History Yearbook* (1978) pp.36 - 45. M. Falkus, 'The Development of Municipal Trading in the Nineteenth Century' *Business History* XIX (1979) pp.134-161



which threatened possible private businesses. However, this problem does not seem to have been important in any of the three cities.

The question of the introduction of secondary sanitary systems must reflect not just the finance question but also the necessary technical preconditions to the systems. For example, the introduction of public baths and wash-houses is only really feasible after the introduction of a sufficient water supply system, and the introduction of a sewerage system to remove the larger amounts of water from the environment. The upgrading of urban housing, likewise, must wait until there are officially adopted standards for adequate urban housing and until there is an agency for identifying deficiencies and ensuring improvements are carried out. This agency was commonly found in the form of local government employees, such as Borough Engineers and the staff of the improvement committees, who evolved during the nineteenth century into highly structured professional organisations. The role of professional individuals in the implementation of secondary sanitary policies will be considered further in chapter seven.

What is likely to affect the decisions of the respective municipal authorities of Liverpool, Belfast and Glasgow? It has already been illustrated that finance is not always primary motivating factor in the introduction of sanitary systems of any size or shape. Glasgow's tardiness over the installation of sewers and water closets was unexpected, given the relative financial stability in the city. Liverpool's progressive attitude to water closets and sewers cannot be reconciled with their lack of financial acumen over the waterworks. One of the pre-requisites for public baths and wash-houses on a large scale must be the abundant supply of water. Thus Liverpool would be expected to lag behind Glasgow in this respect. The identification of the sanitary advantage of public baths and wash-houses should be the same in all three cities, and should provoke the same demand from residents to authorities. However, earlier chapters have shown that in Belfast the Corporation (which national government had decided should control the expenditure) was not within the control of the interested parties, because of the limited size of the electorate, and the manipulation of municipal government by local factions on national political themes. It will be interesting to see if John Bates' economising also applied to relatively cheap municipal schemes such as public baths and wash-houses, or whether he identified them as a potential profit source for the corporation.

## 6.2 Liverpool

The well documented 'bunglings' of Liverpool Corporation over the water crisis should not distort the overall image of sanitary achievement in the city. One of the best examples of Liverpool's progressive attitude was the early introduction of baths and wash-houses for the use of the public. However, this piece of municipal enlightenment was initiated primarily by private individuals and does not deserve to be credited to the corporation's sanitary policy. The motives of the corporation and the individuals provide clear cut examples of the two opposing theories for the provision of public sanitary facilities. The individuals were concerned with ensuring that the poorest of the poor could 'attain cleanliness' while the corporation saw the baths as a profit making concern, and responded to the overwhelming demand not by increasing the capacity but by increasing the admission price to the point where demand fell to a manageable level. This generated the profit to fund the construction of other municipal sanitary schemes but in the short term, at least until the end of the century, the poor were denied access due to the high price of the admissions tickets.

Liverpool was under no compulsion in the Sanitary Acts to provide public baths and wash-houses, and the question of where to locate them in the committee system was also problematical. The Health Committee would seem to have been the obvious place, to draw on the links with other sanitary sub-committees. The first public wash-house facility was opened in the city in 1832 by Catherine Wilkinson, who allowed the poor to use her kitchen during the cholera epidemic. Her initiative was sustained by the District Provident Society, and supported by Councillor William Rathbone, who put pressure on the Council to provide a more 'official' establishment. This they did in the form of the Frederick Street Baths which were opened on 28th May 1842.<sup>10</sup> It must be remembered that this came into operation at a time when Liverpool was still supplied with a deficient quantity of water by private companies. There are no indications of how much water the baths and wash-houses required, but the period in question was still supplied with water on an intermittent basis, which must have affected the possibilities of providing a truly 'professional and commercial' service. Liverpool Corporation adopted the Public Baths and Wash-houses Act on 5th January 1848. It applied this through the Health Committee until a separate Baths Committee was formed on 9th February 1852.<sup>11</sup> While the baths were under the control of the Health Committee, Newlands, the Borough Engineer, made himself thoroughly involved with their development. This continued after the formation of the independent committee, and led to a request from the Baths Committee in 1852 to the Town Clerk to clarify the

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<sup>10</sup> J. Newlands, *Report to the Baths Committee* Liverpool Corporation, October 1856.

<sup>11</sup> Liverpool Corporation Baths Committee Minute Book 6.12.1852 p.79 (LRO 352 MIN/BAT 1/1)

formal relationship between the committee and the Borough Engineer.<sup>12</sup> This undoubtedly reflects Newlands philosophy that sanitation did not recognise conventional municipal committee boundaries, and that any possible way in which public health could be improved justified his intervention.

The Baths Committee was concerned from the outset that the baths and wash-house should pay for themselves and not rely on subsidies from the main rating system. Consequently, when they found that demand was great for the facilities offered, they increased the charges for washing from 1d. to 2d. for 6 hours, for cold baths from 1d. to 2d. and for warm baths from 2d. to 3d. They installed a vapour bath at Frederick Street in 1849 for which they charged 1s.<sup>13</sup> However, even with these increased charges, there was a loss for the year to June 1843 of £108. The committee thus decided to persist with increasing the charges, so that a profit could finance the further extension of the facilities in the city. The fact that the baths were used mainly by the better classes is reinforced by a minute extract from the Baths Committee in 1852:

Resolved. That notices be put up at the several baths requesting visitors not to give gratuities to servants and informing them that a book is kept for entering remarks.<sup>14</sup>

It is unlikely that the poorest poor would have sufficient funds to give tips, or that they would put comments in the visitors book. The committee opened a second baths and wash-house establishment in Paul Street in November 1846. The sanitary benefit of the wash-houses was not entirely forgotten, as the Corporation continued to allow the free washing of infected clothing.

Liverpool was seen as a model for baths and wash-houses in the 1840s. Representatives from the London Society for the Improvement of the Condition of the Working Classes asked for details and plans of the new Paul Street building in 1845.<sup>15</sup> The Baths and Wash-houses Acts of the late 1840s were also a response to the perceived success of the Liverpool experiment.

The high mortality rates that greeted the new sanitary administration in 1847 highlighted to the Health Committee the shortage of washing accommodation in the city. Free baths had to be stopped for schoolchildren due to opposition from paying customers who could not get in, and women were queuing to do their washing.<sup>16</sup> This sudden demand for clean bodies and clothes can only show that the connection between

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<sup>12</sup> Liverpool Corporation Baths Committee Minute Book 29.11.1852 p.77 (LRO 352 MIN/BAT 1/1)

<sup>13</sup> Vapour baths resembled turkish baths ,and were for relaxation rather than for just cleansing the body. It could be suggested therefore that this is an indication of the corporation moving away from their initial target market of the very poor, towards the middle classes who saw baths as a social activity.

<sup>14</sup> Liverpool Corporation Baths Committee Minute Book 1.3.1852 p.13 (LRO 352 MIN/BAT 1/1)

<sup>15</sup> Liverpool Corporation Council Minutes 1.10.1845 (LRO 352 COU)

<sup>16</sup> Liverpool Corporation Health Committee Minutes 30.11.1847.

disease and dirt was well known even among the lowest socio-economic groups. The Health Committee in early 1848 had resolved to use the Public Baths and Wash-houses Act to apply for borrowing powers for £25,000 with which it bought five sites in the city, including High Park Street, Smithdown Lane and Everton, but eventually the Corporation only built the Cornwallis Street establishment, which was not opened until 1851.

At this time, the Corporation decided to separate the profitable baths (which were used by all classes) from the loss making wash-houses, which were primarily intended for the use of the poor. The wash-house side of the Cornwallis Street building was not opened. Bate estimates that the baths were always the popular side of the service, with the number of bathers increasing 23 times between 1842 and 1858, whilst the number of washers increased less than 7 times.<sup>17</sup> Another public bath was built in 1863 in Margaret Street, and in 1866 the Baths Committee was dissolved and responsibility for baths and wash-houses was transferred to the Water Committee. This period in Liverpool was one of water shortage, following the disastrous Rivington Pike scheme, and it was therefore unlikely that there would be sufficient water to meet the needs of existing establishments, let alone any expanded facilities.

Liverpool, however, embarked upon a new phase of baths and wash-houses in the 1870s, prompted by public demand. The Water Committee endured sustained attacks for the lack of progress on additional bathing facilities, and the fact that the existing establishments were not free for the poor. *Porcupine*, the satirical Liverpool newspaper frequently carried articles about baths, stating that in New York the baths were free and used by up to 5,000 men per day.<sup>18</sup> Its argument for free bathing was both olfactory and sanitary.

To intensify such odours it only requires a downfall of rain, when the clothing being wet and the body heated, the emanations during the process of drying assume a compound of odours of the most nauseous and sickening kind. Each person in these circumstances becomes a moving nuisance, and carries about with him the elements of disease.<sup>19</sup>

Another article focussed on the economics of providing free baths.

better to tax the town to pay for free baths, than to pay for the disinfection of infected houses; for tons of carbolic to sprinkle our streets; and for a large extra staff to visit the homes of the victims of filth.<sup>20</sup>

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<sup>17</sup> W. Bate, *Sanitary Administration of Liverpool 1847-1900* (Unpub. M.A. Thesis, Liverpool, 1955) p.127

<sup>18</sup> *Porcupine* 17.9.1870 vol 12 p.249 "Free Bathing"

<sup>19</sup> *Porcupine* 23.7.1870 vol 12 p.166 "Free Bathing Needed"

<sup>20</sup> *Porcupine* 18.2.1871 vol 12 p.573 "Free Baths"

In 1873 the Baths Committee was re-established to administer the £40,000 the Corporation had gained the power to borrow to provide facilities in the new areas of the city. This sudden demand from electoral petitioning groups responded to recreational not sanitary ideals, and the new facilities which were provided were tailored to larger plunge ponds <sup>21</sup> rather than individual baths. By 1883 the city had 8 public baths, which were used by approximately 448,000 bathers a year.<sup>22</sup> During the 1890s the Corporation completed a massive restoration programme, and in 1898 were planning two more public baths.<sup>23</sup> Despite the success of the recreational side of the plunge baths, the Baths Committee was aware at the end of the century that it had failed to meet the sanitary requirements of Liverpool, as had been recognised when the committee was first formed in the 1840s. They were told that the public baths were not being used by 'the exceedingly poor, to whom twopence is a consideration.'<sup>24</sup> They therefore considered installing throughout the city shower baths, which could be built more cheaply in cubicles, and for use of which the Sanitary Inspectors could issue tickets to the 'deserving poor'. This project never came to fruition.<sup>25</sup> The Corporation also failed to capitalise on the sanitary benefit to be gained from widespread provision and use of wash-houses. By 1900 there were only four wash-houses in the city, comprising of 311 'tubs', which were used by an average of 168,229 washers a year.<sup>26</sup> However, although the price was kept within the means of the poor through out the century, Newlands found that the wash-houses were used mainly by employees of the middle and upper classes, or by professional washerwomen.<sup>27</sup> He justified his reluctance to embark upon a major expansion of the wash-houses by saying that

these wash-houses are generally regarded as a public good, whereas they only indicate a great evil and are at best but an expedient to palliate the defects of structural arrangements in the houses of the poor....merely to burden the public to supply that in charity which it is the duty of the houseowner to provide as a right.<sup>28</sup>

Thus Liverpool was once again at the cutting edge of sanitary reform, and work undertaken in the early stages was beneficial. However, the impetus was lost, and the changing perception of the function of public baths and wash-houses from sanitary to

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<sup>21</sup> What we now call swimming pools.

<sup>22</sup> *Liverpool Daily Post* 25.12.1883.

<sup>23</sup> Annual Report of the M.O.H. 1898.

<sup>24</sup> Liverpool Corporation Baths Committee Minutes 20.9.1899.

<sup>25</sup> W. Bate, *op.cit.* p.132

<sup>26</sup> Annual Report of M.O.H. 1898.

<sup>27</sup> J. Newlands, Report 1856. p.91. 50% of those using the Frederick Street facilities were washerwomen or servants, and only 8% were labourers' wives.

<sup>28</sup> *Ibid.*, p.92.

recreational legitimised the Corporation's transformation of the service into a municipal trading activity, in which profit was not a dirty word.

### 6.3 Glasgow

Glasgow's entry into the world of public baths and wash-houses was considerably later than Liverpool's, which is surprising given the city's relatively progressive stance on other public health issues. The Corporation made a feeble attempt in the early nineteenth century to provide public baths, but the main initiative was taken up by the Police Commissioners in the 1860s.

The necessity for public facilities was first impressed upon the Police Board in 1863, when a typhus fever epidemic struck the city in August. The newly appointed Sanitary Committee of the Police Board recognised the link between dirty individuals and the spread of the disease, and the Medical Officer (Gairdner) was instructed to find a suitable site for a wash-house to wash infected clothing. The provision of this wash-house is clearly justified in the minutes as a temporary measure, for the duration of the fever.<sup>29</sup> The next entry in the Sanitary Committee minutes relating to the erection of the wash-house is not until 19th January 1864, when the Police Board agreed to approach the Corporation to arrange the lease of some land on which to site the wash-house. There is then another period of inactivity till the wash-house is built and ready for use on 30th August 1864, a full year after the Medical Officer identified it as an effective sanitary measure in the prevention of the spread of disease.<sup>30</sup> The Sanitary Committee resolve to keep close control over this facility, and introduce a chain of notifications to use the facilities:

1. Notification by Medical staff to Inspector of Cleansing
2. Inspector of Cleansing to remove clothes and bedding
3. Items to be cleaned by wash-house employees
4. Bedding straw to be burned and new supplied by Inspector
5. Items to be returned when house has been cleaned

There is no indication of how long this wash-house for infected clothes and bedding operated. However, in May 1869, acting on the Police Act of 1866, the Police Board decided to provide permanent baths and wash-house facilities for the public.<sup>31</sup> It was

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<sup>29</sup> Glasgow Police Commissioners Sanitary Committee Minute Book Vol 1 p.6 18.8.1863 (SRA E1/16/1)

<sup>30</sup> *Ibid.*, Vol 1 p.58. 30.8.1864.

<sup>31</sup> Glasgow Police Act 1866. The sections of the act which relate to the provision of baths and wash-houses are 387 and 389:

"The Magistrates and Council may provide at one or more points within the city convenient premises for the use and accommodation of the inhabitants as public baths, wash-houses or drying grounds, and for that purpose, by agreement with the owners lessees and occupiers, may purchase or rent buildings or lands, or erect on such lands other buildings, and from time to time may alter, renew or add to and repair, maintain and fit up such premises, and employ proper persons as keepers thereof."

not until February 1875 that a sub-committee for baths and wash-houses was appointed.

In July 1876 the Police Board opened the London Road baths at a cost of £2250, followed by the Kennedy Street baths in March 1877 for £630 and an annual lease to the corporation of £30. In August 1878 they opened the Greenhead baths. By May 1880 the Police Board had obviously decided to reduce their involvement in the short term in the baths and wash-houses of Glasgow. They deferred a decision to build baths at Woodside Road until put under pressure by the ratepayers of that district. They leased the London Road and Kennedy Street baths to a tenant, who subsequently abandoned them in September 1883 when they failed to realise an adequate profit.<sup>32</sup>

Another three bath and wash-house establishments were opened by the Police Board in Glasgow in the 1880s - Cranstonhill in May 1883, Townhead in June 1884 and Gorbals in April 1885. The extension of the city boundary in 1891 sustained the supply of new districts who wanted local public baths and wash-houses. The residents of Springburn and Maryhill petitioned the Board in 1892.<sup>33</sup> Again the initial method of enquiry had a sanitary bias, as shown in the motion put by Councillor Langlands

That it be remitted to the Baths and Wash-houses committee and the Medical Officer of Health to enquire and report as to the sanitary condition of the district of Maryhill, with special reference as to its requirements for baths and wash-houses.<sup>34</sup>

By May 1896 the total capital expenditure on baths and wash-houses in Glasgow was £119,000. There were five sites, all offering similar facilities. Each site had two swimming 'ponds' (male and female) and approximately 35 hot baths, the charge for which was: male first class 6d. male second class 4d. and female 3d. The attached wash-houses had stalls for between 44 and 78 washers which cost 2d. per hour to use. There was also a laundry with a staff of professional washerwomen until 1896. Bell and Paton provide some more detailed information on the habits of the users, suggesting that women did their washing on average once a week for 2 hours at a time, and that people took baths once a fortnight.<sup>35</sup>

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"The Magistrates and Council may from time to time make bye-laws for the regulation of such baths and wash-houses and drying grounds, and the conduct of the persons using the same, and may fix such reasonable charges for the use thereof as they think fit."

<sup>32</sup>J. Bell and J. Paton, *Glasgow its Municipal Organisation and Administration* (Glasgow, J Maclehose: 1896) p.175

<sup>33</sup> Glasgow Police Board Baths and Wash-houses Committee Book Vol1 p.67 26.5.1892 (SRA E1/24/1) The committee minute book for this committee begins in May 1891, although the committee seems to have been created in 1875. Therefore there is no detailed information on the establishment of the other facilities. The minutes are brief - detailing amounts of paybills authorised, considering applications from swimming clubs for reduced rates and reports of committee members who have visited the establishments in the past month.

<sup>34</sup> *Ibid.*, p.84. 16.9.1892.

<sup>35</sup> J. Bell and J. Paton, *op.cit.*, p.17.

The question of what percentage of Glasgow's poor used these facilities is raised by a letter from the Medical Officer to the committee in 1891, in which he reports that the female sanitary inspectors are concerned that the washing deposits of 9d. are beyond the means of the poor. The committee respond to this by reducing the deposit to 6d.<sup>36</sup> The monthly returns made to the baths and wash-houses committee show that there were approximately 43,077 bathers and 14,133 washers per month, and that most of these came from the immediate vicinity of the establishment.<sup>37</sup> Russell, the Medical Officer for Glasgow during this period was well aware of the difficulties in getting the poor to travel any distance to public facilities, especially if they had to negotiate tenement staircases with large bundles of clothes. He saw the provision of baths as ultimately a domestic concern rather than a public utility.<sup>38</sup>

The number of washers may not accurately reflect the use by the working classes, as a large number of professional washerwomen operated in the city, using the wash-houses to do the washing of the middle classes. After the introduction of the Factory and Workshops Act in 1895 the Police Board reviewed the legality of its position regarding the provision of staff in the wash-houses to do paid work. When the Police Act of 1866 (which establishes the baths and wash-houses) is scrutinised, there is no mention of the right to provide staff, or to run the facilities as a profit making concern.<sup>39</sup> This also raises the municipal-ethics question of

whether, as a matter of public policy, the corporation should establish themselves as competitors in the laundry business with ratepayers in the city who carry on such a business for their maintenance.<sup>40</sup>

The Police Board therefore withdrew its own washerwomen employees after this enquiry, thus losing a profit on the wash-house side of the operations of £248 p.a.<sup>41</sup>

The conclusion must be, therefore, that the provision of public baths and wash-houses in Glasgow responded to the demand set by the residents. However, the pricing system as in Liverpool meant that it did not fulfil the ultimate 'sanitary' aim of the Police Board, as it kept away the poorest poor. The involvement of the Medical Officer in the expansion programme indicates the clear link that the municipal authorities saw between cleanliness and the suppression of disease in the city. In the 1890s they allowed schoolchildren free use of the pool, and agreed to reduce the charges for

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<sup>36</sup> Glasgow Police Board Baths and Wash-houses Committee Minute Book Vol 1 p.7. May 1891 (SRA E/1/24/1)

<sup>37</sup> *Ibid.*, p.5

<sup>38</sup> J. B. Russell, *Public Health Administration in Glasgow* (Glasgow: MacLachlan, 1905) p.42

<sup>39</sup> See footnote 30 which specifies that accommodation and equipment only can be provided.

<sup>40</sup> Glasgow Police Board Baths and Wash-houses Committee Minute Book p.359. 24.1.1896. (SRA E1/24/1)

<sup>41</sup> The accounts for the year to 31 May 1895 show an income of £1378 and an expenditure of 1130 (which was mainly the wages for the washerwomen), thus realising a profit of £248. Baths and Wash-houses Committee minute book p.355. 24.1.1896.



occupants of property owned by the Glasgow Workmen's Dwelling Company. They also tried to encourage frequent and regular use of the baths and wash-houses by issuing advance books of admissions tickets at a discount price.<sup>42</sup> The reputation of Glasgow's baths and wash-houses must have been favourable, as it was seen as a model for other urban authorities who wished to make investments in that area. In 1896, officials from Ayr visited Glasgow for a tour of the baths and wash-houses to assess the level of provision, layout of the establishments, and the type of laundry equipment to install.<sup>43</sup>

The entrenched dispute between the Corporation and the Police Board is part of the explanation for the peculiar way in which the public baths and wash-houses service developed in Glasgow. It can be suggested that if this function had been under the administration of the Corporation rather than the Police Board from the outset, that the provision would come nearer to meeting the expectations of the consumers, even if this was achieved through promoting the service as a trading activity.

#### 6.4 Belfast

As predicted in the introduction to this chapter, the impetus to provide public baths and wash-houses came not from the legitimate urban government (the Corporation) but from a charitable concern, almost replicating the way in which the waterworks were established. The decision to install baths in Belfast was taken by the Society for the Amelioration of the Conditions of the Working Classes which was founded on 13th February 1845.<sup>44</sup> The hygiene-health connections was evident from the start, with the local doctor and sanitary reform campaigner Andrew Malcolm appointed as secretary of the Society with a salary of £50 per year.<sup>45</sup> They started a subscription, with the intention of providing a site and building if the Corporation would undertake the long term management of the establishments. Several sites were considered, but the site in the centre of the town raised objections from the inhabitants because of 'possible annoyance from a constant concourse of the poor'.<sup>46</sup> Malcolm went to England in April 1846 and inspected baths and wash-houses in Liverpool, Southport, Bolton, Manchester, Halifax, Hull and London. From these investigations he found only one self-supporting establishment for the working classes.<sup>47</sup> A site was decided on in Townsend Street, and an estimate of the cost of construction and fitting out was £3,044, despite the fact that the Society had raised only £1,200 through the

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<sup>42</sup> *Ibid.*, p.95. 11.11. 1892.

<sup>43</sup> *Ibid.*, p.109 3.2.1896.

<sup>44</sup> P.R.O.N.I. Ulster Museum papers D.1860/1

<sup>45</sup> H.G. Calwell, *Andrew Malcolm of Belfast; Physician and Historian* (Belfast: Brough Cox & Dunn; 1977) p.79

<sup>46</sup> *Ibid.*, p.81

<sup>47</sup> *Ibid.*, p.81

subscription. The initial size of the establishment was therefore scaled down, and eventually provided 13 baths at a charge of 1d. cold, 2d. warm and 4d. vapour, which included free soap, towel and flesh brush. There were also 68 washing stalls which cost 1d. for 3 hours use. Malcolm saw the potential for making a profit on the enterprise by providing washerwomen in the wash-house, and in May 1847 the establishment opened. In the first 9 days 1,328 people had taken baths and 222 people had washed clothes. The total income for this time was over £24. The ultimate aim of the Society was to provide facilities for the poor, so they made available books of one dozen wash-house tickets for 1s 6d. to 'ladies and gentlemen' for distribution free to the poor.<sup>48</sup>

However, the Society could not make the baths and wash-house pay for itself, and they took out a loan after the first year. A solution seemed to be for the Corporation to use its newly acquired powers to provide public baths and wash-houses under a local Act to purchase the establishment from the Society, but the Council refused to take over the baths and there followed a long dispute during the late 1840s.<sup>49</sup> In 1848, a terrible year for cholera, Malcolm appealed to the Corporation in three guises for them to take over the establishment - as secretary and treasurer of the Belfast Sanitary Committee, as secretary of the Society for the Amelioration of the Condition of the Working Classes, and as an Officer of Health on the Town Council. By 1851 the Society had a petition signed by over 1300 people, including 88 doctors to ask the Corporation to buy the baths from them, as they had a debt of £1,400.<sup>50</sup> By 1853 the baths and wash-house were still operating - just - with an increased entrance fee in an attempt to reduce the debts. Their imminent demise caused much public concern.<sup>51</sup> The case went to Chancery, and the Corporation eventually agreed to buy the enterprise for a price of £950, once it had established a special rate for the purpose, but later reneged on the promise.

In January 1860 the Society put the baths up for sale, hoping to find a commercial buyer, with no success, and eventually sold the building in 1861 for the paltry sum of £200. Malcolm in particular must have felt disappointed at the failure of his grand dream which he explained thus

The bath is no longer a luxury, devoted to the exclusive gratification of the wealthy. It is here for the labouring man, who at the close of the day may now refresh and invigorate his toilworn frame...Glad should he be to see this day. A new source of enjoyment and recreation is opened up to him which may supersede .... the nightly frequenting of the tavern -

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<sup>48</sup> *Ibid.*, p.83

<sup>49</sup> *Belfast Newsletter* 5.10.1847 / 3.12.1847 / 2.5.1848 / 3.10.1848.

<sup>50</sup> *Belfast Newsletter* 2.1.1852

<sup>51</sup> *Northern Whig* 27.1.1853 article by Revd. William O'Hanlon

which will bring him home to the bosom of his family a new man...renewed in body and in mind, and disposed to cultivate and improve his leisure hours....<sup>52</sup>

It was not until 1879 that the Corporation finally provided public baths for Belfast, when the Peter's Hill establishment was opened. In 1888 baths were opened in Ormeau Avenue, in 1893 a further set of baths were opened in Templemore Avenue, and in 1896 in Falls Road. The attempt by the Corporation to introduce public wash-houses under the Baths and Wash-houses Act of 1897 was a failure, possibly because they refused to provide facilities for independent washerwomen.<sup>53</sup>

The opposition of the Corporation to providing baths and wash-houses was not ideological, but financial. Bates' policy from 1842 till 1855 was to restrict funding to the 'essential services' such as street improvements, increased market space, cheaper gas supplies and to invest Corporation finances in property speculation. However, the appropriate people and authorities in Belfast must have been aware of the relative merits of affording the urban population some facility to wash themselves and their clothes and bedding. Malcolm's 1848 'Report on the Sanitary State of Belfast' (which was the initial product of the new Belfast Sanitary Committee) acknowledges the contribution of the early 1840s sanitary reports.<sup>54</sup> He draws from the reports a collection of 'momentous facts' <sup>55</sup> including one that the causes of disease are often local and capable of removal, and that they are 'embodied in a vitiated atmosphere produced by deficient drainage, *cleansing* and ventilation.' Belfast was, therefore, well aware of the national and international trends of thought on the role of sanitary improvements in reducing mortality.

The involvement of a charitable concern in the initial provision of what was recognised as an important sanitary service, must confirm the historical weakness of the Corporation of Belfast as a power base. This was no doubt a response to the eighteenth and early nineteenth patronage system through which the Donegall family manipulated the Council to ensure its investment in the infrastructure of Belfast. The alternative power bases which were developed, such as the Chamber of Commerce could not claim to be the natural providers of a 'sanitary' service, whereas the implicit connection between public sanitary services and their use by the poor made charitable organisations the legitimate controlling authorities.

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<sup>52</sup> A.G. Malcolm, *Cleanliness and the Advantages of the Bath* (Belfast; 1848)

<sup>53</sup> R. Blaney, *Belfast: 100 Years of Public Health* (Belfast: Belfast City Council; 1988) p.12

<sup>54</sup> Specifically he pays homage to 1) Report in to the Sanitary Condition of the Labouring Population of Great Britain (1842) 2) Report of the Select Committee of the House of Commons into the Health of the Inhabitants of Large Towns and Populous Districts of Great Britain and Ireland (1840) 3) Report of the Royal Commissioners to inquire into the existing state of the large towns and populous districts of England and Wales (!st report 1845, 2nd report 1846)

<sup>55</sup> A.G. Malcolm, *Report on the Sanitary State of Belfast* (Belfast: J Henderson; 1848) p.7

## 6.5 Conclusions

The initial conclusion must be that none of the three cities achieved the ultimate aim of providing a free or affordable secondary sanitary system. They all failed to meet demand in terms of provision of number of baths and wash-houses, their location throughout the cities, and their cost. Their goal should have been something similar to the New York establishments, which could serve up to 5,000 people a day, free. For maximum efficiency, the baths and wash-houses should have been free for everyone (thus removing any stigma of charity for the the poor), they should have been dispersed evenly throughout the cities, (so that all residents had one within walking distance), and they should have been open all day every day.

Liverpool and Belfast recognised the need to install baths and wash-houses at a comparatively early stage (Liverpool 1830s, Belfast 1840s). They clearly were responding to recent sanitary reports that implicitly linked dirt and disease, but they were also responding to the visual effect of poverty. They therefore wanted to achieve three things by investing in baths and wash-house establishments. First, they wanted healthier people, not 'walking nuisances' which would pose a threat to the other urban inhabitants. Second, by tackling the signs of poverty, they must have convinced themselves that they were going some way to improving the lives of the poor. Thirdly, they wanted to establish a 'going concern', a municipal service which would enrich the lives of all the city dwellers, in the same way that free libraries and parks did, which at the same time raise some profit to subsidise the cost of coping with the effects of a continuing dirty domestic environment.

The cost of installing baths and wash-houses was a motivating force in their timing only in Belfast, where Bates pursued a very tight financial policy for political ends, which delayed the installation of corporation baths till the 1880s. However, Glasgow's whole programme cost £119,000 by the end of the century - hardly in the same league as the Loch Katrine water scheme (£920,000). A possible delaying factor in the expansion programmes in Liverpool and Belfast might have been the lack of a good and plentiful supply of water, but Glasgow did not have this excuse. Glasgow's late entry into baths and wash-houses is as puzzling as its late entry into a main sewerage system. The sanitary authority (the Police Board) obviously underestimated their possible sanitary impact, and the late expansion was motivated primarily by recreational demand rather than a response to the link between dirt and disease.

Public support for public baths and wash-houses was strong at varying times in all the cities. In Belfast it was expressed through the Charitable Society, whereas the other cities lacked this type of ready-made poor peoples spokesman. It is likely that if the Charitable Society had not got itself into such financial difficulties over the water

works, it would have campaigned more actively against Bates' policy, or had sufficient capital to continue the baths started by the Society for Amelioration of the Condition of the Working Classes.

A general conclusion must be, therefore, that all the cities underestimated the amount of sanitary improvement they could gain from providing a system that met demand in terms of accommodation, and one that was free to ensure all people used it as frequently as they needed to. The importance of urban power bases in sanitary decision making is highlighted by this study, and raises important questions to be discussed in the following chapter - how much was sanitary reform conditioned by local and national opinion, did the transfer of control over policy pass from the elected councillors to the salaried experts at the same time in all three cities. More importantly, did all three cities have the same degree of expertise to call upon, or was this a function of the city's size and relative wealth?

## Chapter Seven

### Public Health Professionals

#### 7.1 The Role of Professionals

During the nineteenth century the status of people involved in the management of the urban environment became increasingly formalised. They can be broadly categorised into medical, technical and administrative groups, each with its own hierarchical structure. There have been several major studies of the importance of professionalism in the nineteenth century.<sup>1</sup> However, additional work is needed in specific areas, namely how important individual professionals were in influencing activity in the urban environment and also how the emergence of national 'associations' of professionals affected government policy. To some extent the two issues cannot be separated. The comparative effectiveness of the individual Medical Officer of Health or the Borough Engineer resulted to a large extent from the roles they were assigned by the municipal authorities, and this in turn reflected the image they presented to the populace and the relative status of their chosen professions. Thus, for the nineteenth century spectator the role of sanitary hero went to the Medical Officer, who did battle with the invisible forces of disease, and who was really the only person who could evaluate the success of his work. On the other hand, the Borough Engineer actually produced a 'saleable good' in the form of a physically present sanitary system, which in the eyes of the purchasers (i.e. the municipal authorities) either worked or didn't work. The initial research presented in the course of this thesis tentatively points towards a hypothesis:

A lack of central government control placed the responsibility for the development of an organising framework for sanitary systems in the hands of the local urban administration. The resultant systems identify the overt manipulation of the urban infrastructure by specific groups. The relative success of these initiatives was dependant on the power exerted at the personal level (i.e. by particular individuals) and also the outcome of power struggles between traditional and new urban elites.

#### 7.2 Decision Making in Local Government

A central concern of this thesis is to try to identify who was actually accorded the decision making role in urban management during the second half of the nineteenth century. The debate centres on the relative duties of the elected councillors and the

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<sup>1</sup> E.P Hennock, *Fit and Proper Persons* (London: Edward Arnold, 1973), and recent work by C. Hamlin, *The Sanitarian Becomes an Authority* (Unpublished paper for the conference on the History of Public Health and Prevention, Stockholm, 1991)

salaried officials. Was there a shift in power during this period? Did it happen in all municipal authorities at the same time and was it responding to the same stimuli? Did the changing technological requirements of the urban infrastructure necessarily preclude the active participation of the councillors? How important was individual ability or collective status through membership of a professional body?

In part these questions can be answered by looking not at the salaried officers but at the councillors. There is undoubtedly more information to be had on the attributes of councillors than for the municipal employees. Hennock's classic study of the composition of the town councils of Birmingham and Leeds also addresses the wider, national and international situations. He identifies a significant gap between the expected and the reality in terms of the quality of the councillors, with a noticeable decline taking place as the century progressed. The expectations held of councillors by the electorate was that they should be

1. Men of station or respectability
2. Men of substance, property or wealth
3. Men of intelligence or education.<sup>2</sup>

Potential councillors were expected to qualify without question in category one, and ideally as well in the other two. However, this set of expectations is not matched by the urban elite. There is an implicit assumption in nineteenth century culture that the aspiration of every urban dweller was to create enough wealth to be able to migrate to the rural area and to a new position in the more important social hierarchy. The status of town councillors seems to have suffered an irreversible decline during the century, with the social composition of councils moving from the local gentry and large businessmen to the shopocracy and the small time entrepreneur. This may be desirable if the role of the elected councillor is confined to reporting the wishes of his electorate. Indeed, the move towards a more socially balanced council was one of the fundamental beliefs of John Stuart Mill, who saw participation in government as a civilising process, and did not agree with the vision of places like Birmingham, which was praised for being 'a business city, run by businessmen on business principles.'<sup>3</sup>

The issue of the competence of the councillors only becomes relevant because a general study of municipal employees is so discouraging, in terms of their authority in urban management, and to some extent their personal qualifications. The 1835 Municipal Corporations Act made it mandatory for corporations to employ certain key personnel, a Town Clerk, a Treasurer, Surveyor, etc.<sup>4</sup> The Town Clerk was the most important. Initially it was a part time post, which the holder fitted into his routine legal job. This was practicable when the business of the pre-1835 corporations consisted

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<sup>2</sup> E.P. Hennock, *op.cit.*, p.308

<sup>3</sup> J. Ralph, 'The Best Governed City in the World' *Harpers Monthly Magazine*, June 1890.

<sup>4</sup> 5&6 William 4 c.76. Section 58.

mainly of property management and the administration of justice at magistracy level. However, as the work load of reformed corporations increased, the Town Clerk became a full time employee.<sup>5</sup> The duties of the Town Clerk in the early years after the 1835 Act were very much de-limited by the Town Clerk himself. An aggressive, politicised man could use his co-ordination of the sub-committee system to promote his own policy. Less ambitious men would find fulfilment in routine correspondence and minute taking. Likewise, the municipal Treasurer did not have a stereotype to conform to. In some corporations he was responsible for the financial systems (collecting the rates and ensuring the corporation always balanced its books), while leaving decisions on rate increases and investment procedures to the chairman of the finance committee, or the Town Clerk. Sometimes, the office of Treasurer was a complete sham, with the real control being exercised by the Chief Financial Officer - often the Town clerk.<sup>6</sup>

The other key municipal employees had significantly more independence from the councillors, due to the nature of their expertise. The Surveyor, Borough Engineer and Medical Officer of Health were all responsible for providing the council with specific guidance in their respective fields. The ignorance of the councillors thus inflicted less pressure, or desire to interfere. From these employees they expected detailed policy statements.

### 7.3 Defining the 'Professional'

The question of the image of professionals in urban society has been addressed by Magali Sarfatti Larson. She has investigated the development of various professional groups both in Britain and in the U.S.A., focussing particularly on their relative power bases. However, there remains the initial problem of how to define a 'profession'. The most generalised description offered by Sarfatti Larson is that they are

occupations with special power and prestige. Society grants these rewards because professions have special competence in esoteric bodies of knowledge linked to central needs and values of the social system, and because professions are devoted to the service of the public, above and beyond material incentives.<sup>7</sup>

Other qualifications which transform an occupation into a profession seem to include a prolonged and specialised training, self regulation of working standards, and recruitment from middle and upper classes. Using this type of criteria the commonly

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<sup>5</sup> Manchester was one of the first councils to have a full time town clerk when it upgraded Joseph Heron in 1846.

<sup>6</sup> The 1835 Municipal Corporation Act prohibited the Town Clerk from also holding the office of Treasurer, so this was a convenient by-pass.

<sup>7</sup> M. S. Larson, *The Rise of Professionalism - A Sociological Analysis* (Berkeley, University of California Press, 1977) p.x.



accepted 'professions' are all verified, such as Divinity, Medicine and Law. More recent occupational groups to have claimed status as professions are not so easy to place, such as Civil Engineering. It is accepted that it has involved a period of training, and that the 'product' is for the benefit of society. However, Larson suggests that professions are further characterised by the way in which they organise themselves to attain market power and limit the number of practitioners by means of strict entry requirements and examinations. Larson summarises this by stating that

Professionalisation is thus an attempt to translate one order of scarce resources - special knowledge and skills - into another - social and economic rewards. To maintain scarcity implies a tendency to monopoly: monopoly of expertise in the market, monopoly of status in a system of stratification.<sup>8</sup>

Viewed in the larger perspective of the occupational and class structures, it would appear that the model of profession passes from a predominantly economic function - organising the linkage between education and the marketplace - to a predominantly ideological one - justifying inequality of status and closure of access in the occupational order.<sup>9</sup>

### *Medicine*

The medical profession in the nineteenth century has been evaluated from several perspectives. Brand's thesis focuses on the way in which it developed its work base through the connections with the state, particularly the way in which doctors were employed by the state to perform duties in the Poor Law and public health policies.<sup>10</sup> Novak suggests that the medical profession consciously saw the public health movement as their chance to enter the civil service bureaucracy and thereby to raise their status.<sup>11</sup> Other work, for example that by Pelling, tries to redress the balance from a view of doctors as an elite in society, to a view of them as little more than tradesmen, who underwent a collective transformation sometime during the century, and emerged with a new status, and a new set of scientific techniques with which to baffle the layman.<sup>12</sup> Pelling draws on the work of Peterson, which stresses the competition and class division within the medical profession.<sup>13</sup> This finds support in Porter's review of

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<sup>8</sup> *Ibid.*, p.xvii.

<sup>9</sup> *Ibid.*, p.xviii.

<sup>10</sup> J. Brand, *Doctors and the State: the British Medical Profession and Government Action in Public Health 1870-1912* (Baltimore: John Hopkins Press, 1965)

<sup>11</sup> S.J. Novak, 'Professionalism and Bureaucracy: English Doctors and the Victorian Public Health Administration' *Journal of Social History* 6 (1973) p.443

<sup>12</sup> M. Pelling, 'Medical Practice in Early Modern England: Trade or Profession?' in W. Prest (ed), *The Professions in Early Modern England* (London, Croom Helm, 1987) p.91

<sup>13</sup> M. J. Peterson, *The Medical Profession in Mid-Victorian London* (Berkeley: University of California Press, 1978)

the medical profession, which charts the development of internal rules for the occupation, starting with the Apothecaries Act of 1815. This can be seen as the first definite step towards restricting membership to competent practitioners, to prevent any further deterioration in the image of the medics. The transformation of medicine from a trade to a profession is vague, and made more difficult by the wide range of skills within the occupation, from the Harley Street consultants who operated very much in a reciprocal trade with the teaching hospitals, to the unlicensed bone-setters and homeopaths.

During the century, the medics re-organised themselves through the development of a number of key organisations, most notably the British Medical Association in 1832. However, as central government became increasingly aware of the role it wished to give to medically trained personnel, it was unhappy with the profession's own internal systems of quality control, and through the Medical Act of 1858 it established one supreme register of legally recognised practitioners. Inclusion on this register was the primary requirement for any governmental medical posts, such as Medical Officers of Health, and Poor Law doctors. Practitioners not on the register were disqualified from holding public medical office.<sup>14</sup>

But how effective did the government experts of the day expect the use of medically trained personnel to be? Chadwick (not a doctor himself) saw the profession as 'supine and venal - a body with such a vested interest in diseases to lack motivation for its eradication' and that 'public health was a matter of engineering not medicine'.<sup>15</sup>

### *Sanitary Engineering*

This group was diverse in its membership, and also less numerous than the medics. It included specifically the Water Engineers, Sanitary Engineers and Borough Engineers. The status of the posts varied widely, and the important question to ask at this stage is whether they could collectively be called a 'profession'. Why is this so crucial? Because their relative status in the nineteenth century urban environment was determined by such simplistic criteria, and this in turn decided how much control they could have over the programme of sanitary reform.

If we consider the pre-requisites for a 'profession', it is clear that the engineers fulfil some of them, but not all. They exercised the use of a specialised body of knowledge, which was acquired during a training period, and was formally recognised by the Institution of Civil Engineers. This organisation also to a certain extent looked after the interests of its members, in the same way that the British Medical Association served the general practitioners. The second criteria for definition as a profession is that

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<sup>14</sup> R. Porter, *Disease, Medicine and Society in England 1550-1860* (London: Macmillan, 1987) p.51

<sup>15</sup> *Ibid.*, p.59-60

the members should have the ability to exact a high price for their 'product', and that they should manipulate the pricing system to ensure this. However, this pre-supposes that there is initially a demand for the product in excess of their ability to supply it. During the nineteenth century there was a growing market for the services of Civil Engineers, but the price of these products varied in much the same way as the price of medical services varied, depending on whether they were purchased from an eminent consultant or a back street quack. Engineers' incomes also ranged, from the exorbitant consultancy fees for water engineers to the pitiful municipal wages of the sanitary officer. A third criteria, which is inextricably linked to income is the question of status. This is difficult to assess, as the judgement, to be useful, has to be made with 'nineteenth century eyes', based on how the engineers' contemporaries valued them. Again, as with medics, there must have been a range of statuses. This question is best addressed in the detailed sections of the chapter, by looking at real engineers and doctors.

The only disqualifying factor for the engineers would seem to be the question of restrictions on entry, which Larson stresses are essential to a profession to ensure status and income. Whereas the medical profession moved during the century to a more restricted group (by its use of the Register, based on qualifications), the engineers continued to draw in men who had a wide range of educational and training backgrounds. Most "sanitary" engineers actually held the qualification of Civil Engineer, and as such came within the control of the Institution of Civil Engineers. This was formed in 1818, initially with the intention of providing a forum for the discussion of new technical information. There was a keen awareness that with the rapidly changing state of knowledge that the membership would be of most benefit if restricted to the most recently trained. Thus the second resolution specified that "the ages of admission shall not be less than twenty years nor greater than thirty-five".<sup>16</sup> Membership was restricted to those who were 'studying the profession of a Civil Engineer', but there was opportunity too for the more senior members to participate, and later a new class of membership was added - corresponding members who were too far from London to take part in the weekly meetings, but who wanted to be sent publications. The first president of the Institution was Thomas Telford, already a well known 'name' and thus ensuring the Institution some credibility. A more important step in the 'professionalisation' of engineering was taken in 1828 when King George IV presented the Institution with its Royal Charter. The Institution continued to grow during the century, and attracted the most eminent of the engineers to its offices of President (including Rennie, Stephenson, Hawksley, Bateman, Bazalgette). It was

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<sup>16</sup> G. Watson, *The Civils: the story of the Institution of Civil Engineers* (London: Thomas Telford, 1988) p.11

thought necessary in 1838 to re-define the qualifications for membership, so that full members had to be Civil Engineers, whilst those engaged in 'construction of machinery' who were considered to be 'tradesmen' were relegated to being Associates of the Institution.

The Institution of Civil engineers thus can be seen as an active proponent for the professionalisation of the engineering occupation. It had a certain amount of power on behalf of its members, in terms of ensuring the qualifications of new engineers, and providing an information network. It was also used by Local Government in the same way that the General Medical Council was to pre-select employees for public office. Most posts carried the stipulation that the applicants should be qualified Civil Engineers, and therefore within the control of the Institution.

However, it is important not to see the engineers as a homogeneous group. It is useful to highlight the extremes of the spectrum, as the cities of the nineteenth century saw the workmanship of those at the top and the bottom of the profession. On the one hand there were the consultant engineers, who were responsible for the large projects such as waterworks and drainage systems. They were tied not to a specific place but to a reputation, on which they built their businesses. Their expertise acted as a fee regulator as it imposed restrictions on the rise of new blood. This is because most councils, when deciding to part with such enormous sums of money, would only buy the 'named brands' of consultants. There was therefore a small group of consultant engineers whose reputation preceded them - in national newspapers and in council minutes of fact-finding tours. Cost was not a primary consideration when large engineering decisions had to be made. Councils were convinced that the most expensive engineer must *de facto* be the best, and thus the safest to use.

The designers of most of Britain's urban engineering projects can therefore be counted on one hand. Bazalgette 'did' London's sewerage and drainage, and went on to advise Belfast and Glasgow. Simpson's London, Newcastle, Bristol and York waterworks were so successful that Kirkwood was sent from America to take lessons, with a view to replicating them.<sup>17</sup> Hawksely bagged the Liverpool and Nottingham waterworks, while Bateman got Manchester and Glasgow.<sup>18</sup> The fees these consultant engineers earned were impressive - they received an initial sum for the investigation and recommendations, and then were usually taken on to design the detailed schemes, and to oversee the construction for a percentage of the final construction costs.

But the consultant engineers were a minority. Hamlin has focussed on the majority group - the run-of-the-mill engineers employed by corporations throughout the country, to operate the creations of the elite. This group had little in the way of

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<sup>17</sup> W.H.G. Armytage, *A Social History of Engineering* (London: Faber and Faber, 1959) p.140

<sup>18</sup> G.M. Binnie, *Early Victorian Water Engineers* (London: Thomas Telford, 1981)

bargaining power for employment. Was this because its skills were not valued, or was it because there was no existing reference of values by which their work could be assessed? Theirs was a relatively new job description, but the more important point is that the valuable part of engineering had already been done by the consultant engineers. The services they offered therefore could not exact a 'scarcity premium'. They were, in most cases, managers not creators.

Professional life for the municipal engineer during the '50s, '60s, '70s, and ever into the '80s and '90s tended to be unpleasant indeed. Such a job title emerged from the Chadwickian agitation, as an amalgamation of a range of public surveyor positions - i.e. parish surveyors for roads, county surveyors for bridges, sewers commission surveyors, district building inspectors - whose provenance lay far back in a dim past visible only to Beatrice and Sidney Webb.<sup>19</sup>

Hamlin also gives evidence of the time-consuming process of job hunting which most municipal engineers had to go through, which involved not just applying, but sending a copy of one's testimonials to each council member with a personal covering letter, and following this up by calling on each one to 'demonstrate one's deference'.<sup>20</sup> It was only in the larger towns and cities that the post of engineer carried any degree of respect and status, and this filtered down in the early years of the next century, enabling engineers to dictate employment conditions and salaries.<sup>21</sup> The establishment of some national organisations with concern for the more specific interests of municipal engineers also aided their cause, such as the Association of Municipal and Sanitary Engineers and Surveyors.

The transition in the status of municipal engineers was also the result of the increase in their duties within the urban management structure. This was a conscious decision, and it fitted well with the division of municipal duties into the camps of 'legal', 'financial' and 'other'. In the early years, the work was not well paid (£120-150 p.a. for a small town Borough Engineer), and unlike the medics employed by the corporations, there was no possibility of moonlighting.

#### 7.4 Who was the natural Sanitary Reformer?

This question is important, but probably went un-asked during the formative stage in the nineteenth century. Undoubtedly the medical profession felt that it fell within their traditional jurisdiction, being initially centred on the identification and

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<sup>19</sup> C. Hamlin, *The Sanitarian Becomes an Authority, 1850-1910* (Unpublished paper for conference on the History of Public Health and Prevention, Stockholm, 1991) p.5

<sup>20</sup> *Ibid.*, p.6

<sup>21</sup> 'Regulations for the Employment of Engineers by Local Government Authorities in England, Wales and Ireland' *Proceedings of the Institute of Municipal and County Engineers* 46 (1919-20) p.513-520

elimination of the causes of disease. However, the most effective sanitary measures, because (as Chadwick recognised) they were technical, fell within the duties of the engineers. In some places the engineers actually requested control over these functions, but in the average town, I would suggest that they were given these duties because they were the accepted 'dumping department' for unpalatable tasks.

If we return to the hypothesis which was presented in the first part of this chapter, the preliminary investigation would support the view that the final division of sanitary duties between medical and engineering staff was determined to some extent by the national perception of the relative merits of these groups, but it is tempered at the local level by the size of the settlement, as this will determine firstly the size of the professional groups resident within it and second the corporation finances available to purchase consultant engineering advice, and the salaries it can offer to municipal engineers.

The detailed studies of the three cities, if this hypothesis is valid, would therefore be expected to show certain features. First, it would be anticipated that the medical profession in Glasgow would be important in determining sanitary policy, given that Glasgow University was respected in the country for its medical school, and that along with Edinburgh it produced a substantial number of the leading doctors of the nineteenth century. Secondly, it would be expected that there was greater use of the expensive consultant engineers in the wealthier cities of Liverpool and Glasgow. However, the most important feature which the case studies will hopefully highlight is that the division of duties was fluid, and varied from place to place, with some consideration for the traditional de-limitation of power within the urban environment.

### 7.5.a Liverpool

#### *William Henry Duncan*

The name of William Henry Duncan is synonymous with the beginnings of the public health movement in Britain, and it is partly through him that Liverpool gains its image as a progressive city. Duncan's presence (separate from any beneficial work he did in Liverpool) ensured that Liverpool was seen to be making efforts to move in the right direction. It shows willingness on the part of Liverpool to drag itself off the bottom of the sanitary ladder. However, the appointment of Duncan was more than just a cap-doffing gesture to the demands of Chadwick.

Duncan was appointed as Medical Officer of Health in 1847, having held the posts of Physician to the Liverpool Royal Infirmary and Lecturer in Medical Jurisprudence at the Royal Institution.<sup>22</sup> He was 42 years old and was already

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<sup>22</sup> W. Frazer, *Duncan of Liverpool* (London: Hamish Hamilton, 1947) p.48

established in the social-medical networks of Liverpool, being a member of the Athenaeum and the Liverpool Medical Institution, and occupying a house in Rodney Street which was one of the upper class districts of the town.

Despite his lucrative private practice, Duncan had served his time after qualifying by working as Physician to the South Dispensary, and he had helped in 1832 to try to alleviate the worst effects of the cholera epidemic. He had also given evidence at the Poor Law Commission's inquiry into the state of the Irish poor in Great Britain which resulted in a report in 1836,<sup>23</sup> and again he gave evidence to the Royal Commission to inquire into the state of Large Towns and Populous Districts which was used in the first report in 1844.<sup>24</sup> The effort to publicise the problems which the urban poor were experiencing continued when in 1845 Liverpool formed a local branch of the national Health of Towns Association, and again Duncan was active in this organisation as a joint secretary. He was thus well aware of the public health situation in Liverpool. Although he started the appointment as Medical Officer of Health on a part-time basis with a salary of £300 p.a., he soon found that he could not reconcile the demands of public service and private practice, so he became a full-time MOH and his salary was accordingly increased to £750. Duncan had no role model of a Public Health Department from which to work. At first the Corporation provided an office, stationary and the use of a clerk. The post of Medical Officer of Health came under the control of the Health Committee, which had been established by the 1846 Act to unite all the activities which came under the environmental - public health heading (except water supply).<sup>25</sup> This new Health Committee was formed with 16 members of the Watch Committee, 12 members of the old Health of Towns Committee and an additional 10 people. This proved too cumbersome, and a system of five sub-committees was established. Frazer states that Duncan's primary duty was to devise some method of controlling the epidemics of infectious diseases which frequently occurred in the town. This had been stipulated by the 1846 Liverpool Sanitary Act in section 122, which states that

Be it therefore enacted, that it shall be lawful for the said council to appoint .... a legally qualified medical practitioner, of skill and experience, to inspect and report periodically on the sanitary condition of the said borough, to ascertain the existence of diseases, more especially epidemics increasing the rate of mortality, and to point out the existence of any nuisances or other local causes which are likely to

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<sup>23</sup> B.D. White, *A History of the Corporation of Liverpool* (Liverpool: Liverpool University Press, 1951) p.35

<sup>24</sup> Royal Commission for inquiring into the State of Large Towns and Populous Districts First Report PP XVII (1844), Duncan's evidence pp.141-151. Second Report PP XVIII (1845)

<sup>25</sup> Liverpool Corporation Report of the Town Clerk. Council Minute Book 14.12.1846. (LRO 352 MIN)

originate and maintain such diseases and injuriously affect the health of the inhabitants of the said borough, and to take cognisance of the fact of the existence of any contagious disease, and to point out the most efficacious modes for checking or preventing the spread of such diseases.<sup>26</sup>

Duncan started his new job during a crisis period in Liverpool's public health. The Irish famine had swelled the immigration of Irish poor through the port of Liverpool, bringing with them disease. Duncan's initial response was to call for the total prohibition of further immigration.<sup>27</sup> Meanwhile he enforced the 1846 Sanitary Act regulations for the habitation of cellar dwellings, which had been accommodating the surplus Irish population in increasingly insanitary conditions. As with other Corporation employees he was required to produce reports on his operations and directions to the sub-committees.<sup>28</sup> These took the form of weekly reports to the Health Committee and Annual Reports, which after the first few years settled down into a regular format, incorporating mortality data on an age-disease-district specific basis, and a commentary on particular problems during the year.

Duncan's relationship with the Health Committee seems to have been good, and for the most part they adopted his recommendations without debate. Bate finds only two instances when his advice was rejected. The first was when they decided to licence a private slaughterhouse. The second case was more controversial because it directly raised the issue of whether the powers of the Sanitary Acts rested with the local authority or with the individual officer. Duncan had issued a nuisance certificate on a boiling house, but the Health Committee refused to order the institution of legal proceedings.<sup>29</sup> The use of paid officers in formulating policy also changed during the period. During the first few years after the 1846 Act, it was Duncan and Newlands who to a great extent determined policy, and their judgement was usually accepted by the elected council.<sup>30</sup> Another indicator of the way in which the Corporation viewed

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<sup>26</sup> Liverpool Sanitary Act 9&10 Vict. c.127. Section 122.

<sup>27</sup> Liverpool Corporation Health Committee Minutes 14.6.1847. (LRO 352 MIN/HEA) A deputation of the Health Committee was sent to London to see if they could obtain a temporary restriction on immigration.

<sup>28</sup> One of the most fundamental problems with the new Health Committee was that its paid employees - the MOH, Borough Engineer, Inspector of Nuisances and Building Surveyor - reported to sub-committees with the exception of the MOH who reported directly to the parent Health Committee. For the first years of its operation the elected members of the council were in a strong position to influence the actions of the committee, as the balance between themselves and trained professional staff was still in their favour. The Health Committee changed frequently in trying to find the ideal format. In 1847 the sub-committees stripped the parent committee of its authority. This was redressed in 1849 when the sub-committees were reduced to four principal ones. However by 1865 the number of sub-committees had risen again to 11. Source: W. Bate, *Sanitary Administration of Liverpool 1847-1900* (Unpub. M.A. Thesis, Liverpool University, 1955)

<sup>29</sup> W. Bate, *op. cit.* p.18

<sup>30</sup> There were, however, exceptions. For example Newlands recommended that the Corporation should employ its own workmen, but this was not adopted for some time.



Duncan's role was the fact that he was not given staff for his "department". He was conceived of as an adviser, with a separate Nuisance Department for the executive work. Thus until 1851, Duncan had to employ his own servant as a messenger, and his own transport. However, by 1864 the Council voted to exclude the MOH and the Borough Engineer from a meeting at which they were discussing the Sanitary Amendment Bill.<sup>31</sup>

Duncan died on May 23 1863 in Elgin, Scotland. He had been ill for some time,<sup>32</sup> and he was replaced as MOH by Dr William Stuart Trench. Duncan's difficult situation is summed up by Frazer

Duncan was called upon to face the intangible realities of outbreaks of epidemic diseases, the nature of which neither he nor the medical profession of that time understood. Apart from lack of knowledge, Duncan suffered from a lack of resources. The difficulty was not merely office staff but the lack of hospitals, doctors and nurses under his own control. All these resources belonged to the two Boards of Guardians - the Select Vestry and the West Derby Board of Guardians.<sup>33</sup>

Duncan's success in overcoming obstacles like the resistance of the Select Vestry is best measured in the same way that his contemporaries did. Simon and the Liverpool newspapers all note the fall in mortality that had been achieved since Duncan's appointment as MOH. This, to the inhabitants of Liverpool was just as important as Newlands' sewers and paving. Although there is no specific author to which the Liverpool Sanitary Acts can be attributed, it is almost certain that Duncan was mainly responsible, just as he was for the bye-laws that the Health Committee issued.

### *The Medical Profession in Liverpool*

The medical profession in general in Liverpool were an influential and visible group. They found a formal organisation through which to channel their opinions in the Liverpool Medical Institution. This had been formed in 1837 due to the efforts of Dr John Rutter, an influential doctor who worked as a physician to the Dispensary after his training at Edinburgh University. The Institution provided a home for the existing Medical Library of Liverpool and the former Liverpool Medical Society. Membership of the Institution was restricted to doctors, and an annual subscription was charged to pay for the buildings and the purchases of new books for the library. Duncan was the first secretary of the Institution, and ensured that it was used as a discussion group for

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<sup>31</sup> Liverpool Corporation Council Proceedings 24.2.1864 (LRO 352 MIN)

<sup>32</sup> *Liverpool Mercury* 26.5.1863.

<sup>33</sup> W. Frazer, *op.cit.*, p.1 52

such matters as the Medical Reform Bill in 1841.<sup>34</sup> The Ordinary Meetings of the Institution were used to discuss contemporary medical and surgical practices, and new techniques such as anaesthesia. It is not clear whether the Liverpool Medical Institution as a representative body was able to put any pressure on the Council to adopt particular policies. The Liverpool Medical Society, according to Shepherd was generally reluctant to involve itself in medical politics and public health until the 1830s.<sup>35</sup> However, men like Duncan (who was President of the Medical Society in 1837) and the subsequent MOHs provided a communication channel from the Institution to the Corporation.

Another medium for the expression of local medical opinions was the Liverpool Medical Gazette which appeared in 1833 under the editorship of Dr Hunter Lane, another Edinburgh medical graduate who had developed a career in Liverpool. This journal was short lived, but there were other Liverpool medical publications in the following years, most notably the Liverpool Medical Journal which was started in May 1834 but like its predecessor, lasted less than a year.

A general conclusion on the role of the medical profession as a coherent organisation in Liverpool politics would be that it chose not to involve itself, but that particular individuals such as Duncan saw it as a natural extension of their responsibilities. The Liverpool Medical Institution thus saw its function as a forum for the discussion of purely academic medical matters, and as a social organisation, membership of which could promote the careers of individuals within medicine in Liverpool.

### *James Newlands*

James Newlands was appointed to the position of Borough Engineer on 26 January 1847. He was 36 years old and his starting salary was £700 p.a. His appointment was the fulfilment of a Town Council resolution the previous year to advertise for a qualified Civil Engineer to act as Local Surveyor.<sup>36</sup> However, Newlands was fulfilling more than just the duties of a surveyor, he was about to embark upon one of the earliest projects in sanitary integration to be undertaken in Britain. This was unsolicited in terms of his employment contract, and thus the stimuli for his plans must have come either from his own imagination or from someone he respected professionally. The most likely explanation is that it was a combination of his own foresight and the influence of Edwin Chadwick via Duncan.<sup>37</sup> Newlands

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<sup>34</sup> J.A. Shepherd, *A History of the Liverpool Medical Institution* (Liverpool Medical Institution, 1979) p.110

<sup>35</sup> *Ibid.*, p.90

<sup>36</sup> W. Frazer, *op.cit.*, p.43

<sup>37</sup> Duncan and Chadwick corresponded during the 1840s when correlating evidence on the condition of the poor for the Royal Commission on the Sanitary State of Large Towns. It is unlikely that Chadwick had direct contact with Newlands.

essentially wrote his own job description - and involved himself with a wide spectrum of corporation affairs - most of which he could justify from an engineering point of view, but others in which his participation was not always seen as either appropriate or welcome.<sup>38</sup>

Newlands presented reports on many aspects of urban sanitation during his time with the Corporation, and it is these, rather than any official biographical study which indicate his crucial role in Liverpool. He is overshadowed by Duncan throughout his career, even after Duncan's death at the age of 57 in 1863. Newlands survived him by 8 years, to die at the age of 60 in 1871. If character sketches are to be believed, Duncan and Newlands were never rivals, but had a good working relationship.<sup>39</sup> If this is true, it must have been a conscious achievement, for there was plenty of scope for treading on one another's toes. The 1840s can be seen as a period of delimitation of professional boundaries. The landscape of the urban environment was ripe territory to be conquered, and to some extent, the resultant pattern of responsibility which emerged in towns and cities throughout the country was determined by the pre-existing power of social groups and individuals in the urban societal structure. Thus in Liverpool, Duncan's longstanding high public profile gave him a headstart in acquiring the respect and sanction of the urban authorities.<sup>40</sup>

The division of duties under the 1846 Act was split between the Medical Officer of Health, the Borough Engineer and the Inspector of Nuisances. Some of the divisions were done through common sense, others were "lumped" with similar areas of work. There was inevitably some overlap. Newlands for instance, strays into discussing the impact of sanitation on disease in his 1869 report, where he presents a sub-report : *Proceedings in Respect of the Visitation of Cholera*.<sup>41</sup> Duncan meanwhile tells Farr that he has control over the order in which streets are sewered.<sup>42</sup>

Newlands first report is astonishing for its extensive view of the faults of urban society, and the imaginative correctives he proposes. The patience of the Health Committee (who had commissioned from Newlands a plan for sewerage the Borough 12 months previously) was rewarded. Newlands first report was 118 pages long and

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<sup>38</sup> The best example of this is the Baths and Wash-houses Committee 29.11.1852 (LRO 352 MIN/BAT 1/1 p.77.) who ask the Town Clerk to report to the Committee "as to the position which Mr Newlands the Borough Engineer holds in reference to the works necessary for carrying on the said baths and any future baths that may be erected". Newlands' attendance at Baths and Wash-houses committee meetings is never noted in the minutes, but there are frequent requests to the Borough Engineer to prepare plans and specifications.

<sup>39</sup> W. Frazer, *op.cit.*, p.145

<sup>40</sup> Duncan lectured to the Liverpool Literary and Philosophical Society and published pamphlets on the sanitary state of the town. He was a member of the Athenaeum and the Liverpool Medical Institution.

<sup>41</sup> J. Newlands, *Report to the Health Committee of the Borough of Liverpool on the Sewerage, Paving, Cleansing and other works under the Sanitary Act from 1863 to 1868 inclusive* (Liverpool, Liverpool Corporation, 1869) p.28

<sup>42</sup> As quoted in W. Frazer, *op.cit.*, p.117. Duncan's letter to Farr 13.11.1849.

massively ambitious. He had reviewed the 1846 Sanitary Act after its first year of operation and made suggestions on where the Council needed to take more control. He criticised Rennie and Foster, whose drainage schemes he inherited, for not having enough foresight to plan for the growth of the town, and for making technical errors in putting the intercepting sewers at too high a level to be efficient.<sup>43</sup> In fulfilling his initial brief to submit a plan for sewerage of the borough, he indirectly suggested that he should have the authority to determine the layout of the streets so as to minimise drainage costs, and that he should have jurisdiction over the outlying districts of Everton, Kirkdale and Toxteth Park, as they would eventually form part of a continuous urban environment, despite the fact that in 1848 they were separate administrative entities. His plea for a more overt urban control mechanism was justified on a financial basis, namely that if one urban body had control over the drainage of the entire built-up area then it would be easier and more accurate to forecast the cost of the future sewerage and drainage plans - a requirement which had been stipulated in the 1846 Act.<sup>44</sup>

Newlands used his 1848 report to show his intimate knowledge of the advantages and disadvantages of different types of paving, and that this aspect of the urban environment has to be of the best standard to fit in with the rest of his plan, especially the change from street sweeping to street washing. However, he recognised that a more effective solution to the problem of a dirty environment would be to repeal sections 82 and 83 of the 1846 Act

At present, courts and passages do not by the Act require to be sewered, but only drained by a surface channel, which should be abated as soon as possible, by obtaining the powers to add the words 'courts of houses and passages' to sections 82 and 83 of the Act, and to rescind the clauses which render *surface* draining obligatory.<sup>45</sup>

The actual clause of the 1846 Act states that

And whereas numerous houses and buildings have from time to time been erected and built in the said borough, without having proper drains communicating therefrom with any sewer, which proceedings are highly prejudicial to the public good; Be it enacted, That in all cases where any house or building, situate within the said borough, shall at any time be found not to be drained by a sufficient drain or pipe communicating with some sewer, and emptying itself into the same, to the satisfaction of the said Council, and if a sewer of sufficient size, under the jurisdiction of

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<sup>43</sup> J. Newlands, *Report to the Health Committee of the Borough of Liverpool on the Sewerage and other works under the Sanitary Act* (Liverpool: Liverpool Corporation, 1848) pp.9-10

<sup>44</sup> J. Newlands, *op.cit.* (1848) p.60-61

<sup>45</sup> *Ibid.*, p.91

the said Council, shall pass along any street, and within thirty feet of any part of such house or building, it shall be lawful for the said Council, if they shall think fit, by notice in writing, to require the owner of such house or building forthwith, or within such reasonable time as shall be appointed by the said Council, to construct and make from such house or building, into the nearest common sewer, a covered drain or pipe.<sup>46</sup>

Having stated that he would prefer street washing, Newlands went on to design a new lamp 'post', with a water hydrant in the pedestal and a length of coiled hose. He embellished his design by making the lamp post multi-functional, carrying street names, and the distance from the Exchange so that cab fares could be calculated more accurately.<sup>47</sup> He was essentially a practical man, trying to find a use for everything, and insisting on trying out for himself everything he recommended for public use.<sup>48</sup> He rose above the practical at times to consider the aesthetical impact of his work. His ideas on the bathroom, for example, pre-empt the modernists by almost a century:

In the private baths, each apartment should be sufficiently large to admit of the bath standing in the middle of the room, with a clear space all round. To those persons in whom the habit of bathing has to be induced, the going down into a dark dirty looking hole, thrust into a corner, is not very likely to tempt them to renew the experiment.... There is nothing to alarm the most timid, or to offend the most fastidious, when the bath is merely a large vessel in the middle of the floor, standing in full light, with a clear space all round. The apartment should be as light as possible - light is the best handmaid of all cleanliness. The walls and ceilings should be smoothly plastered, the latter arched if possible.... Stone ware baths could, I think, be made for about £6 each, and if it be a further recommendation, they can be moulded in the most elegant forms....<sup>49</sup>

Despite the official nature of the six reports that Newlands produced during his 24 years as Borough Engineer, some of his personality comes through. He was obviously frustrated by the lack of understanding on the Council of his need for large-scale plans of the city, with detailed and accurate measurements. There is also the feeling that he was offended that they intimated that he had wasted Corporation money in replicating

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<sup>46</sup> An Act for the Improvement of the Sewrage and Drainage and for the Sanitary Regulation of the Borough of Liverpool 9&10 Vict., c.127. This was amended by the Liverpool Sanitary Amendment Act 1854 17 Vict., c.15. Section 11.

<sup>47</sup> *Ibid.*, p.98

<sup>48</sup> He had designed a new water closet, and had it installed in the corporation building in Cornwallis Street for a trial period.

<sup>49</sup> J. Newlands, *op.cit.* (1848) pp.129-131

the work of the Ordnance Survey officers. However, his attention for detail was not extinguished. His 1863 report (although much shorter at 37 pages than the weighty 138 page 1848 report) shows that he has investigated the Corporation's idea of installing tramways by obtaining information from the U.S.A., with the conclusion that it could be a very useful system, particularly for the 'humbler classes'.<sup>50</sup> He had also obtained information on the systems of cleansing used in Berlin to assist him in his review of Liverpool's cleansing operations.

Newlands' reputation in Corporation activities can be estimated in several ways. First, there is a gradual progression and personification of his reports. The 1848 report does not bear his name on the cover, being credited merely to the 'Borough Engineer'. By 1869 and his last report, Newlands addressed himself to the whole Health Committee and his name now appeared on the cover of the report in large type.<sup>51</sup>

The second way of assessing Newlands' importance is to look at his funeral. He was enough of a "Liverpool celebrity" to be included in an exclusive book of funeral reports, which details who attended the funeral and all the associated ceremonies. It states that he was

sufficiently distinguished to justify a funeral of a public character, and accordingly, the rite with which his body was consigned to the grave was accompanied by the pomp of municipal honours, and by the presence of a large attendance of leading citizens.<sup>52</sup>

Newlands' mourners included the Mayor and the Council of Liverpool, and rather surprisingly, the former Lord Provost of Glasgow, Mr J. Blackie. The large municipal turn-out did not, however, disguise the underlying feelings on the Council for Newlands. There is no memorial to his death in the Health Committee minutes as there was when Duncan died.<sup>53</sup> A resolution passed by the Finance sub-committee of the Health Committee to pay to Newlands' two dependant sisters the sum of half his annual salary, which would work out at £400, was over-ruled by the council, who agreed instead to pay his salary up until 31 December, which calculates as £330.<sup>54</sup> Achieving a saving of £70 in view of Newlands' considerable service to the city is not in keeping with someone 'sufficiently distinguished'.

This last point is also more in line with the events of 1864, when Newlands was snubbed by the Corporation. He had applied for the post of Borough Surveyor,

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<sup>50</sup> J. Newlands, *Report to the Health Committee of the Borough of Liverpool on the Sewerage, Paving, Cleansing and other works under the Sanitary Act from 1856 to 1862 inclusive* (Liverpool Corporation, Liverpool, 1863) p.16

<sup>51</sup> J. Newlands, *op.cit.*, (1848, 1851, 1853, 1856, 1863, 1869)

<sup>52</sup> *In Memoriam, or Funeral Records of Liverpool Celebrities* (Liverpool, A. Bowker, 1876) pp.183-187

<sup>53</sup> Liverpool Corporation Health Committee Minutes 1871 (LRO 352 MIN/HEA II 1/14)

<sup>54</sup> *Ibid.* Original resolution made by Finance Sub-committee on page 290. This is altered by the Council meeting on 27.7.1871 p.299

the duties attached to which he had performed on an unofficial basis since his appointment as Borough Engineer in 1847. However, the Council voted against his selection by 39 votes to 11 and elected instead Mr John Weightman, who had held the position of Building Surveyor since his appointment at the age of 52 in 1848 with a salary of £1,000 p.a. This seems to have been a deliberate snub, especially in view of the comments of Councillor Beloe, who complemented Newlands on his “laudable desire to rise above sewers and privies to a more honourable position”.<sup>55</sup>

How, then, do we assess Newlands? He was excellent at his job. He had gained the respect and admiration of his substantial municipal staff, and the presence at his funeral of several of the engineers and surveyors to Local Boards attests to his qualities as a teacher.<sup>56</sup> He occupied a house in a very prestigious part of Liverpool, favoured by the urban elite of merchants and professionals.<sup>57</sup> However, the telling comment by Beloe in 1864 would seem to suggest that Liverpool society did not regard his occupation as either 'honourable' or professional. Perhaps his overt concern for the welfare of the “humbler classes” lost him support on the council.

A good example of Newlands' 'charitable' use of Corporation facilities arose in the unusually severe winter of 1861. The weather conditions had suppressed the usual opportunities for casual employment in Liverpool, upon which a large proportion of the labouring classes depended. Newlands persuaded the Health Committee to advertise for workers to clear the ice and snow, paying 2s. a day to as many people as turned up for work. This 'creative employment scheme' operated for several days as a direct response to the threat of violence brought about by economic depression

At one period a repetition of the bread riots of 1855 was apprehended, without sufficient cause as it appeared; but more serious alarm was caused by bands of men prowling about the outskirts of the town watching the departures of gentlemen from their residences, and then demanding food and money from the inmates. Under these circumstances the Mayor and Chairman and Deputy Chairman of the Health Committee instructed me at once to provide for the employment of as many men as should offer.

After Newlands' death in 1871, George Deacon was appointed as Borough Engineer, but he does not seem to have had the public recognition or personality of Newlands.<sup>58</sup> This is hardly surprising. Newlands had completed the necessary infrastructure for all the future needs of Liverpool. His was certainly a hard act to follow.

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<sup>55</sup> *Porcupine* 10.9.1864 'Corporation Gratitude' Vol 6 p.190

<sup>56</sup> In Memoriam *op.cit.*, p.187

<sup>57</sup> His residence at the time of his death was 88 Chatham Street, Abercromby Square. This was a new, smart area of Liverpool consisting of large Georgian style houses laid out around formal gardens.

<sup>58</sup> George F. Deacon C.E. 1871-1879, Clement Dunscombe C.E. 1879-1889, H. Percy Boulnois C.E. 1890-1897, John A. Brodie M.Eng. Wh.Sc. M.I.C.E. 1898-1926.

The last in the trio of municipal sanitary offices that was created by the 1846 Sanitary Act was the Inspector of Nuisances. It was a less important post, relying as it did on the Medical Officer of Health to provide work.<sup>59</sup> The first Inspector of Nuisances was Thomas Fresh. He was appointed at the age of 47 with a salary of £170 p.a. Within his department there was a relatively large staff - a chief clerk, 2 midden clerks, a report clerk and a notice and cellar clerk. The outdoor staff consisted of 2 assistant inspectors, 4 cellar officers, and 2 officers to monitor the general sanitary condition and to measure lodging houses' dimensions for the MOH.<sup>60</sup>

Fresh acted under the 1846 Act, but also the Nuisances Removal and Diseases Prevention Act of 1848 and the Nuisances Removal and Diseases Prevention Amendment Act of 1849. His duties can be summarised thus:

1. the inspection and suppression of nuisances
2. the enforcement of the cleansing of filthy and unhealthy dwellings
3. the superintendence of midden emptying
4. the adoption of proceedings to prevent the emission of smoke from factories and river boats
5. the keeping of the slaughterhouse register
6. the keeping of the register of lodging houses
7. the inspection of cemeteries and knackers' yards
8. the inspection of cellars<sup>61</sup>

These gave him the power to remove nuisances and to forward cases to the MOH for legal action. Like the MOH and the Borough Engineer, Fresh also submitted weekly reports to the Nuisances sub-committee of the Health Committee, and an annual report direct to the Health Committee. He states in the 1851 report that he had established a 'daily communication and co-operation' between the Town Clerk, the Medical Officer of Health, the Borough Engineer the Building Surveyor, the Water Engineer, the Head Constable, and the Inspector of Nuisances.<sup>62</sup> Fresh then gives the details of the communications between the various departments of the Health Committee. It was not until later in the century that the Inspector of Nuisances came under the direction of the Medical Officer of Health, despite the fact that they maintained control of separate departments for some time. Bate however, ensures that our image of Fresh is not that of a completely subservient employee. He states that in 1851 Fresh accompanied the Town Clerk and the Medical Officer of Health to the Home Office to ask for a revision

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<sup>59</sup> The procedure was that the MOH would make inspections of insanitary property as identified by the IN, and then he would issue a certificate to allow the Nuisance department to take action.

<sup>60</sup> W. Frazer, *op.cit.*, p.55

<sup>61</sup> T. Fresh, *Report to the Health Committee of the Town Council of the Borough of Liverpool, comprising a detail of the sanitary operations in the nuisance department, from 1st Jan 1847 to 31st March 1851* (Liverpool Corporation, 1851) pp.7-8

<sup>62</sup> *Ibid.*, p.20



to the Lodging House Byelaws, and that Sutherland of the General Board of Health requested that three Inspectors of Nuisances be allowed to accompany the Sanitary Commission to the Crimea.<sup>63</sup>

The successors to these first three Corporation employees did not leave such monumental achievements in Liverpool's public health, or the detailed reports which catalogued them. There was little scope left for creating or reorganising departments, and policy had been standardised. The other MOHs of the nineteenth century were Trench (1863-1876), Stopford Taylor (1876-1893) and Hope (1893-1924). E.W. Hope was an MOH in the Duncan style, and Duncan may have been more 'academic' like Hope if he had not been so pre-occupied with crises in the first decade of his administration. Hope was able to delegate the routine matters to his assistants, thus freeing himself to research the effects of living conditions and maternal employment on infant mortality.

In the late nineteenth century the relationship between corporation departments evolved and incorporated new connections with central government. This certainly changed the way in which the corporation employees could operate. Research into this area of local government history would be a major project and is therefore not within the scope of this thesis, which essentially concentrates on how public health duties were divided at the formative stage in the development of these three cities.

### 7.5.b Belfast

A key figure in the development of public health in Belfast was Andrew Malcolm. Undoubtedly, he was the equal of Duncan. Born in 1818 into an Ulster middle class family, he trained at Edinburgh in Medicine. His University Diploma was awarded in 1842, with the thesis *On the Pathology of Continued Fever*. He subsequently returned to Belfast where he established himself as a Surgeon, and was also a visiting doctor at the Fever Hospital and a district medical attendant in training to serve at the General Dispensary (this was a charitable organisation). Malcolm also served on the managing committee of the General Dispensary till its closure in 1851 and replacement with the Poor Law Dispensaries.<sup>64</sup>

Malcolm's voluntary medical work was possible because he had been appointed as a physician at the Fever Hospital in 1845. He also was involved in teaching medicine in Belfast, as a lecturer at Queen's College, Belfast. Another parallel which can be drawn between Malcolm and Duncan is their respective involvement in philanthropic societies. Duncan's was the Liverpool Health of Towns Association, while in Belfast

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<sup>63</sup> W. Bate, *op.cit.*, p.24. Quoting Liverpool Corporation Health Committee Minutes 2.1.1851; 1.4.1852; 19.2.1855.

<sup>64</sup> H.G. Calwell, *Andrew Malcolm of Belfast 1818-1856: Physician and Historian*, (Belfast: Brough Cox and Dunn Ltd, 1977) p.23

from 1845 there existed a Society for the Amelioration of the Condition of the Working Classes, of which Malcolm was appointed as secretary with a salary of £50 p.a. (Malcolm was also involved in the Working Classes Association, a separate but similar organisation, which provided Belfast with a free library and water supply). Malcolm was thus closely involved in the provision of Belfast's public baths and wash-house, which he saw as a progression towards a healthier environment

Do we not know the indissoluble connexion between filth and disease - that the one is ever attendant on the other; that of the multitudinous forms of the latter, Fever, the present plague is removing.... equally the wealthiest and the worst, the wealthiest and the poorest among us, is immeasurably the most predominant. Are we not alive the fact that we are literally surrounded by the pestilential poison...? Let us then aid each other in the good work of sanitary reform.<sup>65</sup>

The failure of the public baths was a severe disappointment to Malcolm, and he resigned as secretary of the Belfast Society for the Amelioration of the Condition of the Working Classes in March 1849. It followed close on his failure to activate the Belfast authorities to prepare for the cholera epidemic in 1847, which he had foreseen. He had used the Belfast publication, *The People's Magazine*, in April 1847 to highlight the terrible sanitary conditions in the town. With the aid of a map, he showed the areas which would be particularly hard hit, with their concentrations of back to back houses, open sewers and nuisances.

Our readers will see...that a dreadful calamity is impending and that... we have every reason to expect it amongst us at no distant period. Are we to fancy that we...will escape - or that...we cannot make any impression on its causes...If we remain with our arms folded it will....embrace us with a deadly grasp. Cholera is always most virulent where sanitary measures are most neglected.<sup>66</sup>

His work was drawn from Chadwick's reports, but supplemented by his first hand evidence of the correlation between overcrowding and disease.<sup>67</sup> Malcolm continued his crusade for improved sanitation in Belfast even after the Cholera epidemic had waned. He published pamphlets which urged the Corporation to take action to prevent a repeat, but this did not prevent a third crisis of Cholera mortality in 1854.<sup>68</sup> Perhaps if he had not died at the young age of 38, he would have succeeded in establishing for himself a position of influence and power in Belfast, similar to Duncan's in Liverpool.

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<sup>65</sup> A. G. Malcolm, *Cleanliness and the Advantages of the Bath* (Belfast, 1848)

<sup>66</sup> *Belfast People's Magazine*, Vol 1 No.12 1847 p.280.

<sup>67</sup> *Belfast People's Magazine*, Vol 1 No. 12 1847. p.282. Vol 1 No. 7 1847 p.156.

<sup>68</sup> A.G. Malcolm, *Report on the Sanitary State of Belfast* (Belfast, 1848) Presented to the Town Council. A.G. Malcolm, *The Sanitary State of Belfast, with Suggestions for its Improvement* (Belfast, 1852)

*The Medical Profession in Belfast*

The Belfast Medical School had its origins in the establishment of a dispensary in 1792, which soon developed into a permanent fever hospital for the town. In the severe typhus year of 1818 the hospital admitted over 1,500 patients and the Board of Management of the hospital reported that:

The physicians and surgeons of Belfast should be invited to place their pupils here to acquire experience by observing its practice and the in the course of a few years it might become a School of Physic and surgery of no trifling importance to the young Medical Students of this neighbourhood and the Province of Ulster.<sup>69</sup>

At this time all of Belfast's medical students (about 300 a year) had to travel to Glasgow or Edinburgh to obtain their diplomas. The idea of a medical school in Belfast was stimulated by the perceived unhealthiness of the town. Thus in 1835 a medical school was opened in connection with the Royal Belfast Academical Institution. In 1845 Queen Victoria gave permission for a number of colleges for higher education to be opened in Ireland, and one of the first was Queen's College in Belfast. The Medical Faculty at Queen's attracted a number of respected staff, and student numbers averaged 70 a year in the mid-nineteenth century. A continuing problem was the lack of beds in the Belfast General Hospital, which remained at 100 until 1865 when a further 86 were added. This limited the amount of practical experience which the medical students could obtain, although they were also permitted to train in the workhouse infirmary. There was also a Lying-in Hospital in Belfast which trained students in Obstetrics. There was therefore, an active medical community within Belfast by the 1830's. The medical schools promoted the spread of the latest information, and there were medical societies operating which highlighted the sanitary state of the town. In 1862 the Ulster Medical Society was formed by the amalgamation of the Belfast Medical Society (founded in 1806) and the Belfast and Clinical Pathological Society, which was a break-away group formed in 1853 by Dr. A. G. Malcolm. There were a number of medical publications in Belfast, including from 1857 the *Transactions of the Belfast Medical Society* which later became the *Transactions of the Ulster Medical Society*.

Ireland was somewhat later than the mainland in establishing a system of public health officials. It was not until 1878 that the Public Health (Ireland) Act was passed, which upgraded dispensary doctors into Medical Officers of Health for the districts of Belfast. Their rank, however, was not equal to that of Duncan's in Liverpool, as they were under the control of the Medical Superintendent of Health. The first to be appointed in Belfast was Dr Samuel Browne in 1880. He in turn was responsible to the

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<sup>69</sup> J.F. Fleetwood, *The History of Medicine in Ireland* (Dublin: The Skellig Press, 1983) p.177.

Local Government Board for Ireland which had been established in 1871 and had control over public health administration, and also to the Corporation of Belfast, which was his direct employer. Browne was already in semi-retirement when he was appointed. He was 71 years old and had been a surgeon at the Belfast Ophthalmic Hospital since he qualified in 1851. He was Mayor of Belfast in 1870, and from 1876 to 1880 he had been the Chief Sanitary Officer for Belfast. He died in 1890 (aged 81, and still active as MSOH).

Browne's replacement in 1891 (to 1906) was Dr Henry Whitaker. Blaney gives his qualifications as Licensed by Apothecaries Hall in 1856, Licensed in Midwifery in 1857, the MRCS England in 1858 and MD from Queen's University, Belfast in 1859. Between 1896 and 1906 he was a part-time lecturer in Sanitary Science at Queen's College, Belfast.<sup>70</sup> Whitaker appears as a key witness in the 1896 Inquiry into the High Death Rate in Belfast, and his evidence highlights some of the frustrations he endured in his position. The chain of identification and notification of nuisances and insanitary practices ended in the Public Health Department with the MSOH. He inspected property reported to him by the sanitary inspectors as unfit for habitation, and he then recommended prosecution to the Magistrates. However, they frequently refused to act on his advice, or if they did, the property was frequently improved at the expense of the ratepayer, and the cost never recovered from the owner. His request for the adoption of the Notification of Infectious Diseases Act had also been rejected, due to opposition from the Ulster Medical Association who were the Local Medical Council. His relations with the Improvement Committee were poor. In 1894 he had assumed responsibility for inspecting foundations of new houses to check for contaminated infill land, but he had no control over the house drains which came under the control of the Surveyor who had charge of the streets.<sup>71</sup> Whitaker also had a major disagreement with the Registrar General, who, he claimed, underestimated the population of Belfast at 255,922 rather than 300,000, a calculation that Whitaker had produced based on the average occupancy of new houses built since the 1891 Census. The difference is important. The Registrar General's mortality rate for Belfast was 40 per thousand. Whitaker's worked out at a relatively more acceptable 33.2 per thousand.<sup>72</sup>

Almost as important as the Medical Officer in Belfast during the late nineteenth century was the Sanitary Officer, later to be known as the Environmental Health Officer. The legislation for such a position was contained in the Public Health (Ireland) Act of 1878. The first Executive Sanitary Officer to be appointed was Conway Scott. Like Newlands in Liverpool, he was qualified as a Civil Engineer, but his role was subordinate to that of the Medical Superintendent of Health, within the Belfast Public

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<sup>70</sup> R. Blaney, *Belfast 100 Years of Public Health* (Belfast: Belfast City Council, 1988) p.45

<sup>71</sup> *Report on the High Death Rate in Belfast* (Belfast, 1896) p.62-3

<sup>72</sup> *Ibid.*, p.70

Health Department. In 1896, the staff directly under the control of the Executive Sanitary Officer included two chief sanitary officers and 15 inspectors. These were responsible for the 9 sanitary districts, one for inspecting food, one for inspecting dairies and one inspector of workshops. Conway Scott was enthusiastic but handicapped by his old fashioned view of what constituted the best sanitary system. He was aware that refuse and sewage had to be removed from the domestic environment quickly, but he considered that the best way to do this was not by a sewerage system, but using a dry conservancy method, with the matter removed by the railway network to the countryside. He concluded his 1890 report with the statement that

“It cannot be too clearly understood that there is no sanitary invention or patent nostrum that can remove the filth of a large city and render it clean and healthy and lower the death rate; the only way of doing so is by means of the common scavenger, who is after all the great sanitary reformer.”<sup>73</sup>

The work of Conway Scott and his officers is fully documented in the 1896 *Report on the High Death Rate in Belfast*. He himself was called to the committee to give evidence and to express his concern over the delegation of public health responsibilities between various departments. He had suggested in 1894 with his superior, Whitaker, that the middens be paved and made water-tight, but this was considered to be the jurisdiction of the Improvement Committee. His opinion on water closets seems to have changed since 1890, for he stated to the committee that he recognised the water carriage method as the most efficient, but costly at £4 per house conversion and £10,000 for a sewage treatment plant in the Lough.<sup>74</sup> The inquiry highlights Scott’s heavy work load. He admitted that he was aware that it was his duty within the Public Health Committee to report houses unfit for habitation, but he “doesn’t know” if this had been done.<sup>75</sup> He was constrained in getting nuisances resolved, especially those relating to drainage because the sewers and drains came under the control of the Improvement Committee.

This is one of the clearest indications that is available of the mess that Belfast’s public health administration was in. Surely the Executive Sanitary Officer should have had some influence over the way in which the drainage system was managed? Scott’s role in Belfast now is more closely identified with that of Liverpool’s Inspector of Nuisances, Fresh, rather than with the Borough Engineer. Thus Belfast appears to have had a vacuum in its public health personnel. There is no one in a policy making role. The position of Surveyor in Belfast does not have the same implications as it does in either Liverpool or Glasgow.

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<sup>73</sup> *Ibid.*, p.49

<sup>74</sup> *Report on the High Death Rate in Belfast* (Belfast, 1896) p.9

<sup>75</sup> *Ibid.*, p.19

The 1896 enquiry again provided the only evidence on the operations and effectiveness of the Surveyor and his team within the Improvements Department. The position was held in 1896 by Josiah Corbett Bretland C.E. He appears to have advised the Corporation to buy land in 1885 to provide a site for the disposal of the city's refuse but this was not accepted. His work is vigorously attacked during the enquiry, both through questions put directly to him, and through questions to his assistants George Boyd and James Munce. The evidence seems to show that no one in Belfast had comprehensive information on where land had been infilled with excrement, where sewers had been laid, or if building regulations were applied to new houses.

The situation in late nineteenth century Belfast emerges as even more farcical if it is revealed that another committee had control over the scavenging of the city. The Police Committee were the employers of the "dustmen". However, they only were responsible for the refuse of houses which had no yards and thus not under the jurisdiction of the Public Health Committee. The refuse and excrement of these properties was placed on the road for collection, and then sold by the Police Committee at 2d. per load to anyone who wished to fill in land sites.<sup>76</sup> Bretland, when questioned about his knowledge on the sewer system of Belfast, stated that the map his department worked with was over 40 years old, and that as his workmen discovered old sewers they were added to the map, but that he felt it was still not complete.

### 7.5.c Glasgow

The control of the sanitary state of Glasgow is structured in a very different way to that of English towns and cities. The Police Board had control over much of the daily sanitary operations, and over much of the capital expenditure which took place. The origins of the nineteenth century sanitary system in Glasgow can be effectively dated from the Police Act of 1800, which provided capital in the form of a Police Rate. The Glasgow case is typical of all of Scotland's legislation, which gave the Police a very different role to that held in England and Wales. The Scottish Police were appointed as Sanitary Inspectors, and undertook similar duties to the MOH in England and Wales. It was only when new qualifications in public health were offered by the Scottish universities (responding to the English Public Health Act of 1875, as many English MOHs trained in Scotland) that the domain of the Police Sanitary Inspector was challenged by the MOH. White states that the medical profession in Britain were extremely keen to see their control over sanitary as well as medical offices secured in Scotland.<sup>77</sup> A further erosion of the Sanitary Inspector came with the 1892 Burgh Police (Scotland) Act which made it compulsory for police burghs to appoint MOHs.

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<sup>76</sup> *Ibid.*, p.157

<sup>77</sup> B. White, 'Public Health and Civic Administration in Nineteenth Century Glasgow' *Bulletin of the Society for the Social history of Medicine* 32 (1983) p.37

White also suggests that the failure of the Sanitary Inspectors in Scotland to make a case for their own survival was because they were not sufficiently organised in comparison to the doctors who worked as MOHs, and that the qualifications held by the Sanitary Inspectors were not as widely accepted.<sup>78</sup>

It was only in 1897 with the Public Health (Scotland) Act that the appointment of local Medical Officers of Health was made compulsory, and in towns where the population was over 30,000, they had to have a postgraduate qualification in public health. This is over twenty years behind England and Wales.<sup>79</sup> A Medical Officer of Health was appointed in Glasgow in 1863, but the position was only part time, and the duties were restricted to disease treatment in the city's hospitals and sanatoria.<sup>80</sup> The first MOH, Dr William Tennant Gairdner was 41 years old, and he also held the Chair of the Practice of Physic at Glasgow University.<sup>81</sup> He headed a department of five District Surgeons of Police. This is relevant because it highlights the continuing control the Police Committee had over the sanitary affairs of Glasgow, which in other towns was usually under the jurisdiction of a specific Public Health Committee, taking its powers from a Public Health Act.<sup>82</sup> This power base was still held by the Chief Sanitary Inspector of the Police Department. Gairdner divided the city into 24 sanitary districts, and his scheme with hindsight seems logical, enabling him to use the registration data effectively. However, his vigorous forays in to the realms of 'private property' alarmed the Police Board, who stifled his projects and led to a stalemate situation by 1869. In 1872 the Police Board decided to finish with the services of Gairdner and his five police assistants.

Gairdner was replaced as MOH in 1872 by James Burn Russell, a well known name in nineteenth century public health. He held the post till 1898, and his era is seen as that in which Glasgow's public health policy was firmly established. He completed his medical training in Glasgow in 1862 and went into a post as the Medical Superintendent at the Parliamentary Road Fever Hospital in 1865, rather than the traditional career in private medicine. His primary concern was with the connection between overcrowding and fever morbidity and mortality, which was a particularly acute problem in Glasgow with its rapid population growth and the tenement style of housing. Unlike his contemporaries in Liverpool<sup>83</sup> and Belfast, Russell was a prolific writer on sanitation and housing. His articles were collected into a memorial volume in

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<sup>78</sup> B. White, 'Medical Teaching and the Rise of the Professional Medical Officer of Health in Scotland', *Bulletin of the Society for the Social History of Medicine* 38 (1986) pp. 37-39

<sup>79</sup> Required under the 1875 Public Health Act

<sup>80</sup> B. White, *op.cit.*, (1983) p.37

<sup>81</sup> O. Checkland and M. Lamb (eds), *Health Care as Social History - The Glasgow Case* (Aberdeen: Aberdeen University Press, 1982) p.7

<sup>82</sup> This legislation was provided by the Glasgow Police Act in 1866 and the Public Health (Scotland) Act of 1867, which created a sanitary department distinct in its own right.

<sup>83</sup> With the exception of E.W. Hope.

1905.<sup>84</sup> This has the remarkable feature of a preface by Russell's predecessor as MOH - W.T. Gairdner, in which he highlights some of the problems which he passed on to Glasgow's first full time MOH

One of the conclusions reached and expounded by Dr Russell....is that gross sanitary neglect inevitably tends to the production and multiplication of a class which is not only helpless and progressively in a state of degeneration from generation to generation, but has in itself no power of redemption, so that as regards the community at large, it becomes a truly parasitic class, living upon the classes above it, in such hovels as are provided for it.<sup>85</sup>

The collection of Russell's writings is amazing for its range of subject and quality of information, and includes classic papers such as *Life in One Room*, and *The Children of the City*. He was also the editor of the *Glasgow Medical Journal* from 1868, and in 1891 the British Medical Association awarded him the Stuart Prize for his paper, *The Origin, Spread and Prevention of Epidemic Disease*. He served on the Local Government Board from 1898 as its Medical Member till his death in Edinburgh on 22 October 1904.<sup>86</sup>

#### *The Medical Profession in Glasgow*

Glasgow's connection with medicine during the nineteenth century was through the production of doctors from the University Medical School, rather than the practising doctors in the city. The Medical School was one of the best in Britain, well equipped, and with a reputation for research. (Joseph Lister, famous for his antiseptic method taught surgery in the 1860s before moving to the Edinburgh Medical School, and Andrew Buchanan who taught physiology at the School produced the first explanation of the process of coagulation of the blood). The Glasgow School of Medicine had been formed in 1599 by a Charter of Incorporation which founded the Faculty of Physicians and Surgeons in the City of Glasgow.<sup>87</sup>

Following the 1875 Public Health Act, Glasgow University introduced a Diploma in Public Health, thus giving a formal qualification to a part of the course which had been a traditional area of study for many years, drawing on the legal-medical requirements of Scottish Law. The General Medical Council recognised the DPH from 1886, and by 1889 all three Scottish medical licensing corporations were issuing the DPH. Initially the standard of the DPH in Glasgow was poor, and Glaister (who taught

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<sup>84</sup> J.B. Russell, Edited by A.K. Chalmers: *Public Health Administration in Glasgow* (Glasgow: James Maclechose and Sons, 1905)

<sup>85</sup> *Ibid.*, p.vi

<sup>86</sup> *Ibid.*, p.xxviii

<sup>87</sup> A.F. Fergus, *The Origin and Development of the Glasgow School of Medicine* (Glasgow, MacDougal, 1911) p.7



Public Health within the Glasgow Medical School) asked the General Medical Council not to recognise the qualification until its examination included questions on such basic subjects as epidemiology, sanitary law, vital statistics and communicable diseases.<sup>88</sup> There was an early formal connection between the Medical School of the University and the Corporation of Glasgow, as the MSOH was also appointed as a professor of physic, and as such had teaching duties. Gairdner, the MSOH from 1863 till 1872 was professor of Medicine, and lectured on Public Health.

The Glasgow practising doctors were separate from the Medical School of the University and had little contact with it. They were however, an active and coherent organisation, operating through the Glasgow Medico-Chirurgical Society which was founded in 1844 by Thomas Thomson. There were a significant number of medical societies operating in Glasgow in the nineteenth century. These have been included in a broader study of Scottish medical societies which was conducted by Jenkinson.<sup>89</sup> She suggests that the societies had a greater concern in protecting the interests of their members than their English counterparts, as before 1874 they were not represented by the British Medical Association. The Scottish societies thus had a wider range of concerns, and acted as more than 'social clubs'. The Glasgow Medical Society which was formed in 1814 placed public health as one of its main interests, and collected data on causes of death so that the spread of infectious diseases could be analysed. The *Glasgow Medical Journal*, which first appeared in 1828 was one of the earliest provincial medical publications in the country, and has continued without break since then. Glasgow doctors were active in early sanitary campaigns. Robert Cowan, who was a surgeon at the Royal Infirmary co-founded the Glasgow Statistical Society in 1835 to investigate the relationship between living standards and the incidence of disease in the city. He was briefly associated with Chadwick, but his early death at the age of 45 in 1841 was a great loss for Glasgow. Perhaps he would have rivalled Duncan for the position of first Medical Officer of Health.

The Chief Sanitary Inspector had far more power and authority than the MOH. He had a staff of five divisional Sanitary Inspectors, and approximately 100 Sanitary Inspectors who were engaged on routine surveillance. He also had technical control over the five Sanitary Inspectors who worked for the MOH on disease notification and prevention. It is significant that Glasgow's first MOH was appointed not under a Public Health Act, but under a Police Act.

Glasgow thus had a poor start to its public health policy, owing to the lack of outright control by the Corporation, and the persistent influence of the Police Board, who had traditionally provided sanitary services in the city. Gairdner's career is a good

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<sup>88</sup> M.A. Crowther, *On Soul and Conscience* (Aberdeen, Aberdeen University Press, 1988) p.29

<sup>89</sup> J. Jenkinson, 'The Role of the Medical Societies in the Rise of the Scottish Medical Profession 1730-1939', *Social History of Medicine*, Vol 4 (2) 1991 pp.253-277.

example of how a well intentioned authority can fail to reach its goals without the total support of the urban organisations. The deadlock is broken with appointment of Russell, who had the personality and the power (through the new Public Health Committee of the Corporation under the chairmanship of John Ure). The role of the MOH in Scottish cities is clearly subordinate to that of the Chief Sanitary Inspector. Brand estimates that in England and Wales by 1898 there were 1,771 MOHs. In Scotland, of the 205 burghs employing sanitary staff, 17 had no MOH, and 95% only employed MOHs on a part time basis.<sup>90</sup> White suggests that the experience of late nineteenth century Glasgow is a general sign of the attempt by central government to inhibit local government autonomy in Scotland.<sup>91</sup> The city's response was to firmly stick to the separation of sanitary and medical duties even after the 1897 Public Health Act, thus limiting the power base of the medical profession within the city. The strength of the police in public health in Scotland can best be seen in the way that Chadwick's campaigning of the 1840s for the introduction of Medical personnel did not touch the existing sanitary systems operating in Glasgow. The Police Board was such an integral part of the municipal structure, with responsibilities for rating and providing criminal policing services, that it was almost untouchable, even for central government.

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<sup>90</sup> J. Brand, *op.cit.*, p.109

<sup>91</sup> B. White, *op.cit.*, (1983) p.38

## 7.6 Conclusion

It would seem useful to re-state here the initial hypothesis which was constructed in the introduction to the chapter:

A lack of central government control placed the responsibility for the development of an organising framework for sanitary systems in the hands of the local urban administration. The resultant systems identify the overt manipulation of the urban infrastructure by specific groups. The relative success of these initiatives was dependant on the power exerted at the personal level (i.e. by particular individuals) and also the outcome of power struggles between traditional and new urban elites.

The evidence from the three cities indicates that the initially difficult task of sanitary reform becomes almost impossible if it is attempted through diverse and un-integrated organisations. This is true not just from a financial viewpoint (although financing major systems usually needed the undivided rating support of the entire urban population) but also the sanitary manpower needed some sort of central control to prevent duplication of services.

The respective roles of professionals in nineteenth century public health is not clarified by this study. If anything, it shows the diversity of the duties which were attached to common titles. The Borough Engineer in Liverpool had much more autonomy than his counterpart in Belfast. The members of the medical profession who opt for a life in public service follow similar career paths - qualifying in provincial universities, and then serving 'apprenticeships' in voluntary or Poor Law medical institutions. They all have the ability to understand the entire urban environment in true Chadwickian style. They are experts not only on the patterns of epidemic disease, but also on the merits of waste disposal systems, house design and occupational health. The status of the medical profession is definitely higher than that of the other public health workers, as is shown most clearly by the relative fame and obscurity of Duncan and Newlands.

A surprising conclusion is the lack of influence the presence of the medical school in Glasgow had on the sanitary policies. This is explained by the deep-rooted power of the police authority, which although it is technically within the Corporation structure, is supported by the legal-sanitary system, through which Glasgow has achieved all its sanitary powers.

The second feature which section 7.4 suggested, namely the greater use of consultant engineers in the wealthier cities was also unfounded. Belfast, which had chronic financing problems throughout the century invested a large amount in employing Bateman and Bazalgette to report on possible drainage and sewerage schemes. On the other hand, Liverpool entrusted the design and construction of its

sewerage system to its own internal engineer, who had no experience of large-scale systems.

The manipulation of these 'urban technicians' by central authority (usually the Local Government Board) needs to be investigated, but is a massive research project in its own right.<sup>92</sup> However, it is clear that when the early professionals were appointed, it was up to them to set the margins for their authority, and that these remained relatively intact for most of the century.

Ultimately, the conclusion must be that, as Hamlin has stated, the existing explanations are inadequate to show the 'fragility of these fledgling professions and the open-endedness of what professional orthodoxy would be. They also fail to reflect the even greater fragility of the careers of individual professionals'.<sup>93</sup>

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<sup>92</sup> This would form a companion volume to Christine Bellamy's *Central-Local Relations*.

<sup>93</sup> C. Hamlin, *op.cit.*, p.23

## Chapter Eight

### Conclusions

The intention behind this chapter is to draw together the main conclusions from the substantive chapters and to assess them in the light of the broad hypotheses which this thesis was structured to test. To summarise, there were three main hypotheses:

1. That the degree of pressure exerted by sub-groups in the urban class structure for sanitary reform (and general evolution of the system of urban government) will be a product of the underlying class tensions, which may have been moderated to a certain extent by the diversification of the economic structure, and the subsequent extension of employment opportunities. If control over the actions of the urban government is impossible, alternative urban organisations may be developed to provide a response to demands for specific urban services.

2. Participation in the legitimate forms of urban government will reflect the power which is invested in that organisation, and its status within the urban community. Corporations which succeed in attracting the elite of the local population to serve as elected councillors, and which have a large potential income source in the form of a wealthy (or sizeable) local electorate are likely to be progressive in their attitudes in two ways. First, they will be leaders rather than laggards in the introduction of large scale sanitary systems. Secondly, they are likely to develop these services to their full potential as trading activities, thus maximising revenue and perpetuating the expansion of their urban economy and generating more financial power through their control over a wider geographical area. Urban governments at the other end of the spectrum, which do not have access to the full rateable income potential of their urban area (because of the existence of a rival form of urban administration, or because of the restricted nature of the franchise) will fail to develop municipal services into trading activities, either because of the limitations imposed on the availability of capital, or because the demand for these services is being met by alternative organisations.

3. During the nineteenth century control over policy formulation in the urban environment was transferred from elected councillors to salaried employees. This was a direct response to the lack of central government control over urban administration and the accumulation of local government responsibilities. Control over sanitary reform will reflect the existing status of medical officers and engineers and their respective professional groups in nineteenth century society. The division of duties between these

two types of employee will be a function of the power exerted at the personal level (i.e. the character strengths of individuals) and the outcome of power struggles between traditional and new urban elites. It is suggested that the competence of these salaried employees within specific urban governments will be directly related to the rank of that urban area within the national economy, and to the organisation of power within the corporation structure.

An explicitly comparative framework is ideal for testing these hypotheses. Various combinations of potential controlling factors can be established, as has been shown in the substantive chapters. For example, one would have expected Liverpool and Belfast, in view of their problems with water supply, to have had a similar approach to the installation of sewerage networks and water closets. A comparative approach shows how local political participation was weaker in Glasgow than would have been expected, because compared with Liverpool, the employment opportunities were relatively more stable.

What basic conclusions can be drawn from this research, that consciously seek to answer the hypotheses stated above? The links between the class structure and the urban government institutions are clear in Liverpool, where municipal politics excited massive local interest, and local sanitary issues, such as the installation of a second waterworks could make or break a political party. In Glasgow, dissatisfaction with the operations of the urban administration does not seem to have been substantial enough to result in pressure on local politics. It is possible of course, that discontent did exist, but that there was no way of articulating this within urban government. However, the structure of representation in Glasgow's corporation was no different to that in Liverpool.

The issue of the division of responsibility for the urban environment emerges as a crucial determinant of the entire public health campaign. Two major divisions can be identified through this study. First, a sharing of power between *independent* urban institutions. This occurred in both Belfast and Glasgow, but with differing effects. In Belfast the inherent corruption of the Corporation which had served the Donegall family so efficiently had its legacy in a weak reformed Corporation in the 1840's which was manipulated so successfully by John Bates, and had little status for the true Belfast power groups - the industrialists and merchants. This is demonstrated by the development of the Chamber of Commerce as the effective seat of power, and the charitable societies gradual accretion of 'municipal' functions, such as the installation of waterworks and the provision of public baths. In Glasgow, the division of responsibility for sanitary services was between the Corporation and the Police Board. This reflects an historical association in Scottish legal tradition between sanitary and

policing duties. The separation of natural sanitary 'partners' such as water supply and sewerage systems had the effect of retarding the installation of some sanitary services, which, given Glasgow's financial security and progressive culture, should have occurred at a much earlier date. The Police Board was conscious of the power it had by withholding the sanitary duties from the Corporation, which was the main rating body. Secondly, the division of responsibility for sanitary duties could occur within an urban administrative system with equally devastating effects: witness the problems which Belfast created for itself by not integrating the functions of the Medical Officer's staff with the Inspector of Nuisances. This led to a severe failure of communications, and a breakdown in the system of sanitary surveillance through which the Corporation tried to maintain control over the state of the urban environment.

If we now look at the second hypothesis, focusing on the relative status of the corporations and their elected councillors, the information presented in chapter two would seem to substantiate the theory that the larger corporations attracted more interest, or more specifically, more willingness by the urban socio-economic elite to participate in urban government. Some of the most eminent and successful businessmen served on Liverpool's council, because it gave them direct control over decisions which could affect the prosperity of the city, and therefore their personal investments. At the other extreme, Belfast is an example of a town where policy making appeared to have been 'cut and dried' because of the dominance of one man over the whole selection process for councillors.

This leads into the second part of the hypothesis on the functions of local government - municipal trading and the accumulation of urban services. Urban corporations voluntarily adopted the responsibility for the provision of certain urban services. Public baths and wash-houses were an optional extra, as was municipal housing, provision of tramways and gas supplies. The extent to which corporations extended their duties into these areas was self-determined. The evidence presented here, however, suggests that it was to some degree conditioned by the abilities and imagination of the elected council. Municipal trading required skill and daring - skill to arrange the finance required from the existing corporation income, and daring to move into what was a comparatively new area of operations. The technical requirements of many of these types of municipal activity could not be taken on in a piecemeal way, but required a huge initial investment. Councils like Belfast, as has been stated already, had lost the services of the city's most competent men to rival committees for Chambers of Commerce and Boards of Trade. It is hardly surprising, therefore, that the councillors who were selected for municipal service chose to play safe with the corporation finances, as they did with the accounts of their own corner shops and one-man bands. This explains the failure of public baths and wash-houses, and the late introduction of sufficient water and sewerage systems in Belfast. It was not just a question of by-

passing Bates' financial obstacles, but a question of will, and the nerve to take a decision, rather than passing the buck by commissioning another report, or referring the matter to another sub-committee.

A further point to be made within this section, relates to the hypothesis central to chapter four (water supply). Recent research <sup>1</sup> on the municipalisation of water supplies in the nineteenth century has concluded that the primary explanation for the failure of private water supply companies was that they were unable to raise the necessary amounts of capital required to install the large-scale works demanded by rapidly growing urban areas. The detailed financial information which has been presented for the Glasgow water companies, (supported by the known expansion plans produced by the Liverpool water companies) has shown that limitations on capital were not the constraining factor in the expansion of private waterworks, but that pressure was exerted at a national level for municipal control of this vital sanitary service.

The final hypothesis to be assessed relates to the development of the 'public health professional' in the nineteenth century. It was suggested that because of the traditional status of medical personnel, and the implicit connection between health and sanitation, that authority for sanitary reform would be invested in a Medical Officer of Health within the corporation structure, rather than in a person qualified to understand the essential technical side of sanitation. However, the evidence does not confirm this view.

The case study of Liverpool identifies a dichotomy between the popular understanding of sanitary reform and the actual system of administration. The Medical Officer (Duncan) is widely hailed as the sanitary hero of the city, but I suggest that his contribution was not as substantial as that of the Borough Engineer (Newlands), a virtually anonymous corporation employee. The chapter shows the wide range of duties which were attached to common titles. However, as the century progressed, the sanitarians developed for themselves an occupational hierarchy similar to that which existed for medical personnel. This was entrusted with restricting entry to those who could prove competence, thus raising the status of this type of employee from skilled worker to professional, on the criteria that he now offered an essential service, the quality of which was guaranteed, and reflected in the purchase price. The relative roles of the Medical Officer and the Borough Engineer changed during the century as the emphasis of sanitary reform shifted from the public to the domestic environment, thus to some extent making the Engineer redundant after the successful installation of sewerage and associated services. The role of the Medical Officer, in contrast, began to

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<sup>1</sup> J. Hassan, *The Growth and Impact of the British Water Industry in the Nineteenth Century* *Economic History Review*, 38 (1985) pp.531-547



expand, as medical knowledge advanced and a range of new treatments re-structured the doctor's duties.

The conclusions drawn from the mortality chapter focus on the improvement in mortality for most age groups of urban residents. The factors contributing to this improvement are varied, and difficult to quantify. There does, however, seem to be a general correlation between the introduction of sanitary systems and the mortality decline. In assessing the three cities, which all introduced sanitary systems at different times and in different ways, there is some evidence to substantiate the hypothesis that a sanitary system can only be said to be effective from the time of completion (i.e. when the water supply, sewerage system and conversion to water closets have all been integrated, for the whole community). Thus the introduction of a water system in isolation will have little impact on mortality. The importance of domestic as well as public hygiene is indicated by this study. Changing the attitudes of people to personal cleanliness may have been just as effective as the provision of a sewerage system.

Finally, can a pattern be identified in the cities through the comparative structure of the thesis? Liverpool and Glasgow certainly seem to be similar, with Belfast as the odd one out: sewerage systems, water provision and the level of municipal trading to name but a few examples. However, a persistent theme is the identification in all three cities of the need for sanitary reform, and the desire to alter the inadequate systems of urban government and administration. But ultimately, their relative success is a reflection of their political and governmental systems and the lack of any centrally imposed minimum requirements for urban control. The transformation of the local government structure, which began with the 1835 Municipal Corporations Act should, therefore, be seen as a mechanism for the greater participation of urban residents in a move to improve their working and living conditions.

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officers

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