Towards a history of the waste management business: A research agenda and preliminary findings

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During the last third of the twentieth century, the collection, processing and disposal of municipal solid wastes—the residue of daily domestic life—emerged as not just a pressing political, social and environmental issue, but also as a major economic one. In fact, waste management came to constitute big business in wealthy and highly industrialised countries. In the United Kingdom, for instance, the private and commercial sector of the waste management industry amounted to £3 billion in 1996, while in Germany the industry turned over some €10.9 billion in 2000.[1] The top seven European firms in waste management in 2005 all had sales in excess of €1 billion, and many of them operated internationally.[2]

It was not always so. In the United Kingdom, for example, waste collection and disposal immediately after World War II was not seen as a field for private enterprise, but rather, in a continuation of pre-war practice that was rooted in public health legislation, was carried out at the local level by the public sector. Where private companies were involved they generally operated on a small scale in niche markets, such as collecting waste paper and scrap metals for salvage, an area in which there were some opportunities for profits without large-scale capital investment.[3] Some indication of the contemporary status afforded to waste handling is suggested by its virtual absence from published official reporting at the time: there was no discrete entry for waste collection and disposal in national industrial or economic statistics, something which only began much later. How then, and with what consequences, did waste collection and disposal come to be seen as potentially profitable business, moving from the public into the private sphere and becoming "waste management" in

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[1] BDE (Bundesverband der deutschen Entsorgungswirtschaft). "Zahlen und Daten zur Entsorgungswirtschaft 2005". (http://www.bde.org/01seiten_b/documents/Zahlen-u.-Daten-d.-Entsorgungsw.-Inhaltsverzeichnis_001.pdf pp 14, 19 (accessed 31 October 2006).
BIFFA-HTI (1996). *UK Waste Sector 1996.* http://www.e4s.org.uk/frame_2.htm (accessed 12 October 2006).

[2] D. Hall. "Waste management companies in Europe". Report commissioned by the European Federation of Public Service Unions. Available at: http://www.psiru.org/reports/2006-02-G-EUwaste.doc (accessed 21 September 2006).

[3] C. A. Zimring. *Cash for your trash: scrap recycling in America* (New Brunswick, NJ: Rutgers University Press, 2005).

the process? What was the extent of the metamorphosis? Why did this process differ from country to country, and indeed from locality to locality?

These are the central questions we are seeking to answer in the context of a three-year project funded by the United Kingdom's Economic and Social Research Council,[4] which is examining the causes, course and consequences of the emergence of this industry in two highly industrialised European countries of similar population size and wealth, the United Kingdom and West Germany, between the end of World War II and the early 1990s. Our purpose in this article is to examine briefly the context of existing scholarly literature within which the project is situated, to describe the project and its aims in some detail, and to report on some of the initial results of our research. These initial findings confirm that the project and its approach offer a rare opportunity for sustained attention to the interconnections between business, technology, economy, politics and society as they changed through time.

The scholarly context

Literature on the history of waste management tends to be technically specialised or essentially general, with a dearth of historically based social science approaches to the topic.[5] The interdisciplinary and largely empirical field of environmental history has only recently begun sustained consideration of issues of waste and disposal, while business history and history of technology approaches are even less well developed.

American environmental historians tackled this topic first, focusing initially on industrial waste and/or urban refuse.[6] This was extended to a broader "social history of trash" by Strasser,[7] while Zimring[8] examined a key niche of the industry's private sector, metal scrap, over time. All provide valuable insights and use sources imaginatively, but focus primarily on the United States.

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[4] "Constructing the Waste Management Business in the United Kingdom and West Germany, 1945 to the Early 1990s": ESRC Project Reference RES-062-23-0580.

[5] e.g. H. L. Hickman. *American Alchemy: The history of solid waste management in the United States* (Santa Barbara, CA: Forester Press, 2003). K. A. Gourley. *World of waste: Dilemmas of industrial development* (London: Zed Books, 1992). G. Hösel. *Unser Abfall aller Zeiten. Eine Kulturgeschichte der Städtereinigung, (*Munich: Jehle Verlag, 1987).

[6] Martin Melosi. *Garbage in the cities: refuse, reform and the environment* (College Station, TX: A&M University Press,1981, rev. ed. Pittsburgh PA: University of Pittsburgh Press,2005). J. A.Tarr. *The search for the ultimate sink: Urban pollution in historical perspective* (Akron OH: University of Akron Press, 1996).

[7] Susan Strasser. *Waste and want: a social history of trash* (New York: Henry Holt,1999).

In this area, as in so many others, however, the experience of the United States was unusual in several dimensions. The "consumer society" arrived much earlier there than elsewhere. The peculiarities of the U.S. federal system also affected the industry's development, as did relatively low population density (even in its urban areas) and, related to this, a large hinterland. Americans also produced on average much more rubbish per capita than other affluent nationalities, just as they used on average far more energy per capita.[9] One key strand of the project will be the extension, adaptation, testing and revision of the findings of American environmental historians through attention to the other important national contexts which form the focus of this study.

The literature on these countries is again, apart from the purely technical, much more limited than for the United States, with very little of it comparative. Gandy[10] provides an important exception, with consideration of urban waste—especially recycling—in three cities, New York, Hamburg and London, although he focuses on politics at the local level and on the 1980s and early 1990s. Ongoing research associated with the Institute for Environmental History at the University of Saint Andrews deals with waste in Britain, with projects on recycling, household waste in the 19th century and theoretical aspects of the subject which complement this project.[11] For Germany, there are a handful of studies, including Fuchsloch and Park.[12] Stokes also addresses waste management in East Germany in the context of technological history.[13] Each is typical in its own way of this small field within German environmental/technological history: those studies which exist are tightly

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[8] C. A. Zimring *Cash for your trash: scrap recycling in America* (New Brunswick,NJ: Rutgers University Press, 2005).

[9] D. E. Nye. *Consuming Power: A Social History of American Energies,* (Cambridge MA: MIT Press, 1998) p. 223. M. Brower, M. and W. Lyon. (1999). *The consumer's guide to effective environmental choices: A practical guide from the Union of Concerned Scientists* (New York: Three Rivers Press, 1999), p. 5.

[10] M. Gandy. *Recycling and the politics of urban waste* (NY: St. Martin's Press,1994).

[11] See, for instance, J. Scanlan, *On garbage* (London: Reaktion, 2005), and the forthcoming publications indicated on the web page: http://www.st-andrews.ac.uk/envhist/ahrc.html (viewed 14 January 2008).

[12] N. Fuchsloch. "Metamorphosen oder Euphemismen? Vom Wandel der Abfälle zu Wertstoffen" *Technikgeschichte,* 68 (2001): 373-394, and M. A. J. Park. "Von der Műllkippe zur Abfallwirtschaft. Die entwicklung der Hausműllentsorgung in Berlin (West) von 1945 bid 1990", PhD. Berlin: TU-Berlin, 2004.

[13] Raymond G. Stokes. "The ecological burden of the past: environmental aspects of German Unification", unpublished paper presented at symposium on "The Impact of German Unification: Multiple Perspectives", Houghton Michigan: Michigan Technological University, 1991; Raymond G. Stokes. *Constructing socialism: technology and change in East Germany, 1945-1990* (Baltimore: John Hopkins University Press, 2000).

focused on specialised aspects of waste disposal and/or on individual localities. The only overview in German is very general.[14]

This new study will thus not only complement and extend, but also help define a relatively new scholarly field in at least five distinctive ways. It will use a thoroughgoing comparative approach; it will focus on business and economic historical aspects of the development of the industry; it will explore national, regional and local agendas and interactions; it will pay close attention to shifts in the balance between the public and private sectors; and finally it will consider development over several decades. To show how it will do so, we first provide some additional information on the details of the project before turning to some preliminary results of our research thus far.

A framework for examining the history of the waste management industry after World War II

During the period after 1945, the United Kingdom and the Federal Republic of Germany shared extensive similarities in terms of their affluence, manufacturing and technological capabilities, and population size and density. They also shared what appear to be the most important drivers in the emergence of a distinctly identifiable waste management industry in the post-1945 period, including increasing affluence, spiralling consumerism, growing sophistication of materials used in manufacturing, limited space for landfill, growing public concern about landfills and incineration, and (perhaps most importantly) changing cultural attitudes and policies, not just towards waste, but also towards the role of the private vs. the public sector.[15] In both countries, central and local government responded to these drivers, helping to shape the industry's development not only through legislation, but also through shaping the conditions within which local government became not only a provider of, but also a client for, waste management services and facilities. The two countries entered the post-war period with legislation and practices in the industry which had been established over a long period through to the late 1930s, and they shared problems of shortage and reconstruction in the immediate aftermath of the Second World War which had significant impacts on the industry. The two also witnessed dramatic

[14] G. Hösel. *Unser Abfall aller Zeiten. Eine Kulturgeschichte der Stadtereiniging* (Munich: Jehle Verlag, 1987).

changes in the late 1960s and early 1970s—in particular in relation to the rapid growth of the private sector both in absolute terms and in its market share—owing to growing consumption, new materials and environmental awareness and related legislation. Both were increasingly affected by European legislation and regulation. Finally, the two consolidated new approaches to, and concepts of, the industry in legislation and practice in the early 1990s. The common starting and ending points in the emergence of the modern waste management industry in Britain and West Germany between the immediate post-World War II period and the early 1990s determine the time frame considered in the project.

Despite these commonalities, the two countries evolved very different systems of waste management. The West Germans embraced sorting and recycling regimes much earlier and more thoroughly than the British. In the German case, local authorities had competence over direct levying of fees for domestic waste collection, a practice explicitly proscribed in the United Kingdom and reiterated in new legislation as recently as 1990. The West Germans also pioneered in devising of strategies for reuse of materials which sometimes relied on high technology, as well as developing product packaging legislation and an environmentally orientated industrial policy.[16]

How did the extensive shared drivers in the creation of a modern waste management industry lead to such different outcomes in the two countries with regard to the activities, size, shape, and significance of their respective waste handling industries? One possible answer would be to point towards deep-seated and long-standing social, political and cultural differences between the two, and examination of such differences (as well as some similarities) through time will be part of our approach. After all, it is impossible to understand the industry's development in either case without attention to the emerging environmental movement: initial efforts to develop recycling schemes and technologies were stimulated there rather than in private industry or the state sector in both countries, although there were also extensive differences in timing and approach between them.[17] What is more, the industry sits at the juncture between economic and innovation policymaking and

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[15] Melosi, (2005); R. Millward. *Private and public enterprise in Europe: Energy, telecommunications and transport, 1830-1990* (Cambridge: Cambridge University Press, 2005).
[16] Eunomia Research & Consulting Ltd. *Towards sustainable waste management practice* (Edinburgh: SNIFFER, 2002) p. 9. Volrad Wollny. "Verpackungsabfallverwertung in Grossbritannien" (www.gruene-punkt.de/uploads/media/studie.pdf p. 4 (accessed 29 September 06).

practice. Some government policymakers have thus come to see the waste management industry as not just vital to sustainable economic development, but also as one of a suite of environmental knowledge-based industries to be fostered by innovation and other policies owing to its perceived potential for economic growth and foreign trade.[18] Again, though, although this tendency is to be observed in both countries, different political and legal traditions led at times to different outcomes. Finally, the waste management industry was the place where the consequences of, and tensions between, industrial production, growing world trade and consumption met and required some sort of resolution. In the process, relationships between a number of crucial areas have been highlighted, confronted and changed through time, e.g.: human beings and their material culture; the personal and the collective; the state and the citizen; the public sector and the private sector; and the local, the national and the international levels. Once more, there were a large number of differences—and some similarities—between the United Kingdom and West Germany in the nature of the response to these challenges.

Our contention, however, is that much of the story of the sometimes parallel, sometimes divergent, development of a modern waste management industry in these two countries must be told not only in terms of politics, society and culture, but also in terms of the established themes and concerns of business history and business studies more generally. Markets, entrepreneurship and the role of the state differed in many ways within each of the two countries, and the particular constellation of the political economy in each case was clearly extremely important in the emergence of this new industry (as it was in the case of other new industries) and in the development of companies within it.[19] In particular, evolving markets, regulatory regimes and attitudes towards the public/private divide in the economy[20] provided incentives and opportunities in this industry (again, as in others) for the private sector to move from being a niche player (albeit an important one) to a major force in all aspects of it. Once again, there were similarities between the two countries in this area, but also many differences. The story also involves issues such as innovation and the firm, strategies and processes of competition, diversification and concentration,

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[17] Gandy (1994), Strasser (1999).
[18] C3 Consultants Ltd. (2006). "Research capacity within Scotland relating to key sub-sectors of the environmental goods and services sector", Final report prepared for Scottish Enterprise.
[19] e.g. Alfred D Chandler. *Shaping the Industrial Century: The remarkable story of the modern chemical and pharmaceutical industries* (Cambridge MA: Harvard University Press, 2005).

and the strategy, structure, organisation and performance of firms in each national context.[21]

The project thus focuses on seven principal research questions:

- How did major local authorities (LAs) in the two countries organise and finance waste collection and disposal in the immediate post-1945 period, and what political, economic and cultural pressures or technological developments caused changes in these practices?
- What factors have shaped markets for "waste" materials in Germany and the UK compared to America, and how have markets been shaped in turn by the industry and its technologies? In particular, to what extent have volatility in commodity prices and perceptions of political risk and/or liability shaped the extent of and changes in private-sector involvement in sub-sectors of the industry?
- To what extent have attempts in each country been successful in transforming "waste" into valuable commodities through recycling and reuse, and why?
- What has been the role of research and development, technological change and innovation in this process of redefinition?
- How did individual firms and/or industry interest organisations respond to (or create) emerging business opportunities in this area?
- What role did government play in the emergence and development of the waste management business, as participant, customer and/or regulator?
- To what degree, by what means and to what effect did actors in business and government in each of the two countries learn from one another in this area?

Some initial results

We have begun to explore some of the questions mentioned above by focusing initially on the United Kingdom and by examining not just sources produced at the national level, but also municipal case studies. In the British case, even in the early post-war period, large local authorities performed an extensive and central role in waste handling, involving complex organisational structures, large work forces, and clearly defined managerial hierarchies which operated with substantial budgets. And

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[20] Millward (2005).

[21] E. Penrose. *The theory of the growth of the firm*, 3rd ed. (Oxford: Oxford University Press, 1995). O. E. Williamson. "The modern corporation: Origins, evolution, attributes" *Journal of Economic Literature* 19 (1981): 1537-68. Alfred D Chandler. *Scale and scope: The dynamics of industrial capitalism* (Cambridge MA: Belknap Press, 1990).

it was not only in these respects that the waste-handling operations of large local authorities had a considerable amount in common with large private business enterprises. Certainly, the larger municipal bodies treated collection and disposal of refuse as a complex techno-economic system, involving notions of efficiency, effective resource allocation, and carefully costed capital investment. One hypothesis to be tested, therefore, is that emergence of the "waste management" industry actually predated the coining of the phrase "waste management." The phrase itself emerged in the late twentieth century in the context of changes in environmental awareness beginning in the 1970s and of a politically inspired shift towards the privatisation of formerly public service provisions starting in the 1980s. But it is quite possible that the effective emergence of the "waste management industry" lies much further back in the post-war period and has hitherto remained shrouded in the anonymity of local government administration. If this hypothesis is confirmed, of course, an appropriate further question is whether the eventual shift from public service to private enterprise was responsible for any substantial changes in the philosophy and effectiveness of waste management practices, or whether there was a continuation of the pre-existing *status quo* even as ownership and governance structures in the industry changed.

We have started to test this hypothesis by trying to reconstruct longitudinal data series in relation to costs, income, quantities and types of waste materials handled, and so on. As mentioned already, published national statistics omit such information until very recently, an indication of the relatively low level of importance attached to waste handling by the nation-state for much of the post-1945 period, and we were concerned at first that such data may not have ever been collected. Fortunately, our concerns proved unfounded in at least this respect: a great deal of data pertaining to waste were actually gathered by local authorities and subsequently collated to some extent by central government, even if they only rarely appeared in publicly available documents. On the other hand, the data were collected for different reasons—and therefore with different implications—than some of the statistics produced more recently. At least until the latter part of the 1960s, domestic waste *per se* was seen as having little importance in the context of either the national economy or the natural environment; the records that were created were thus not intended to foster knowledge of waste itself or its impacts on society, but rather as part of accounting and auditing practices that were rooted in the legislative structure that governed the handling of refuse by local authorities.

In the United Kingdom during the late nineteenth and early twentieth centuries, these authorities, the corporate bodies that were responsible for the organisation of life in both urban and rural communities, became the *de facto* trustees of refuse handling on behalf of the public they served. The collection and disposal of household wastes were progressively taken up and organised within the established framework of local government so that, irrespective of the philosophy driving the service, it was inevitable that it would be regulated by the same processes that applied to all other municipal activities, particularly regarding their financial management. Regulation was largely achieved through the recording of data for operating and capital costs which provided a tightly defined means to evaluate how efficient a service was, a quantifiable expression that was intended to demonstrate sound stewardship of the public purse. Such oversight applied as much to the handling of household waste as to any other municipal activity

What we now term waste management was originally called "public cleansing", an indication of the philosophy lurking behind the origins of the organised collection and disposal of municipal refuse in Britain. Although the problems of refuse in organised communities had long been recognised, efforts to tackle them were, until the second half of the nineteenth century, haphazard and generally far from successful.[22] A growing interest in the health and welfare of society led to the Public Health Act of 1868 which, amongst other things, empowered Local Authorities for the first time to recover the costs of removing domestic waste through the local rating levy rather than by means of individual charges. These new "rate fund" costs were therefore borne not directly by the individuals or households actually creating refuse, but indirectly by the ratepayers who made up the local electorate. The expenses of the service fell under local government budget and audit procedures and so, to satisfy those and to demonstrate financial efficiency, a system of monitoring costs eventually appeared which was based on the prices of handling weights of waste and servicing each dwelling in the local authority.[23] It is these financial records leading up to the 1980s which—almost accidentally—allow insight into how much

[22] Lewis Herbert. *The History of the Institute of Wastes Management 1898-1988* (Northampton:IWM Business Services Ltd., 1988). Chapter 1 provides an overview.
[23] See Ministry of Health. *Public Cleansing: refuse collection and disposal; costing returns* (London, HMSO. 1938) Table VIII, p. 18ff. Costs also appeared in the Ministry of Health's contemporary annual *Local Government Financial Statistics* (London: HMSO) but only expressed in terms of rate in the £ of LAs' expenditure.

waste had to be dealt with, thus permitting us to form an overall picture of how relatively important refuse handling was in the local and national economies.

The 1868 Act was supplemented by further public health legislation, leading to the consolidating Public Health Act of 1936 which formed the basis for municipal waste practice through to the 1960s. None of this imposed a statutory duty on local authorities to collect and dispose of refuse, although they had the legal right to do if they wished.[24] That right was taken up voluntarily by local authorities after 1868 as part of what became increasingly perceived as a civic duty which could only be effectively carried out through public administration. This was very much in contrast to practice in the United States, where there was no similar unanimity of opinion and municipal bodies frequently entrusted the task to third parties with varying degrees of efficiency and economy.[25]

Essentially, then, the British model involved the devolution of actual organisation of waste handling to local level as a public health issue. In part as a result of this, national collation of data was approached in a somewhat haphazard and incomplete way. Public health matters, and hence "cleansing", fell within the domain of the Ministry of Health, and during the 1930s the Ministry began to request from English and Welsh (but not Scottish) authorities details of costs incurred in handling domestic refuse. The purpose of this was principally to promote increased financial efficiency amongst bodies of all sizes, rather than to analyse the nature of refuse or assess the its impact on the society creating it. The published *Public Health Costings*, whose contemporary importance to the national government is perhaps indicated by their suspension from 1937 until 1952 (when they reappeared under the aegis of the Ministry of Housing and Local Government), provide a useful, if incomplete, picture of the amount of waste being dealt with and the sums of money spent doing so. The returns expressed costs in terms of tonnages handled and numbers of houses serviced, along with information about the income from what were then known as "salvage" (recycling) activities. Unfortunately for historians, there was no legal requirement or compulsion to provide the information, let alone to guarantee its accuracy, so that some authorities (LAs) failed to provide any data at all and others only estimated very roughly the weights they handled, often based on samples as small as one or two

[24] Dougall Meston. *The Public Health Act 1936* (London: Sweet & Maxwell Ltd, 1937) p. xxvii.
[25] Melosi (2005); William P. McGowan. "American Wasteland: A history of America's garbage industry, 1889-1989," *Business and Economic History* Vol. 24 No. 1 (1995) pp 155 –163.

percent.[26] The returns from 1952 to the mid 1960s covered only two thirds of the population and were sometimes based on figures that were often scarcely more than guesses. Nevertheless, the data are the nearest thing to a national overview and, despite their limitations, they do give an indication of the contemporary scale and cost of municipal waste handling.

The amounts of material collected and disposed of, and the money spent doing so, were considerable. The first post-war survey, for the financial year 1952-53, covered approximately 70 percent of the population of England and Wales and showed that almost £17.1 million had been spent managing over nine million tons of refuse gathered from domestic premises.[27] That sum represented some 2.3% of all LA expenditure for the two countries,[28] with the five largest cities – Birmingham, Liverpool, Manchester, Leeds and Sheffield – being responsible for one seventh of total reported expenditure on refuse collection and disposal. Collection costs greatly exceeded those for disposal; nationally the ratio was 4:1, a figure which may imply that the gathering up of refuse was of greater concern and expense than its disposal, but also may have to do with income from disposal offsetting some of the costs and/or with the relative labour intensity of each activity. We will return to the point about offsetting of costs later. By the mid-1960s the returns were still covering a similar proportion of a larger population, showing an increase of almost ten percent in tonnages handled. In the financial year ending March 1965, expenditure had more than doubled to £36.16 million within a broadly similar distribution of costs.[29] The increase in the amount of waste dealt with was actually greater than the tonnages indicate; changes in the density and general composition of refuse meant that the volume of waste had increased disproportionately and that its disposal was becoming more of a problem.[30] Correspondingly detailed figures were not collected for Scottish LAs, but their Local Financial Returns allow the extraction of some data on public cleansing and show a similar picture of rising costs: there, £4.3 million was spent in 1953, and £9.55 million in 1965, each year amounting to 3.2% of total LA spending, a

[26] Ministry of Housing and Local Government. *Public Cleansing Costing Returns* (London: HMSO, published annually after 1953) See, for example, 1952-53, Table 9, col. 5.
[27] Ibid., Table 9, columns 17-22, grand totals.
[28] D. S. Lees and W. Appleyard. *Local Expenditure and Exchequer Grants* (London: Institute of Municipal Treasurers and Accountants, 1956.
[29] *Public Cleansing Costing Returns* 1964-65, Table 8, p. 27.
[30] *A Review of Public Cleansing in Glasgow from 1868 to 1968* (Glasgow: Corporation of the City of Glasgow, 1968). p.11 provides some examples.

substantially greater proportion than for England and Wales.[31] We are not sure what accounts for this discrepancy, but are investigating this in our ongoing research.

These figures indicate considerable and significant economic activity, whether measured in terms of numbers served, weights handled, or sums spent. In fact, the actual figures must have been considerably higher than those quoted because virtually the whole of the UK's population was provided with regular services for waste removal and disposal, an operation whose scale appears to have been unrecognised nationally at the time and which seems to have been taken for granted both by its clients (the general public) and central government which partly contributed to its costs through the system of general Treasury grants to local authorities. The LAs themselves, on the other hand, were intimately involved with refuse and by no means unconcerned about it. For them, on the basis of the records examined so far, refuse handling was a constantly problematic and expensive reality which occupied a high position in the hierarchy of municipal responsibilities and needed to be run in a decidedly business-like fashion if it were to function at even a minimally effective level.

The records for the City of Glasgow's Cleansing Department demonstrate the scale and nature of one of Britain's largest municipal refuse operations from the end of World War II until the major local government reorganisations in the mid-1970s.[32] During that period, domestic waste handling was still firmly the province of the public sector within a structure of local government which was substantially unchanged from the 1930s. The dominant ethos remained throughout the period one of municipal responsibility for both the scale and standards of services provided. Archival material relating to the department gives an insight into its motivation and management, and the influences which shaped its changing attitudes to dealing with refuse. It also sheds light on contemporary attitudes to environmental concerns and recycling, suggesting that they regularly impinged on municipal thinking, albeit in a form rather different to those displayed at the start of the twenty-first century.

Glasgow had one of the UK's oldest cleansing departments, and officials there consistently claimed that it had always been one of—if not the—largest and best

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[31] Great Britain, Scottish Office, *Local Financial Returns* (London: Scottish Office, 1965). Table "Rate fund services. The returns give no explanation for the difference.

[32] These are held by the Mitchell Library, Glasgow, as Cleansing Department, Annual Reports, collection reference DTC/7/3/1, subsequently cited as DTC.

organised in the UK.[33] Its origins dated back to 1800 when the Chief Officer of Police was charged with the duty of cleansing the streets by sweeping and removing refuse left on them, although the collection of domestic wastes was not involved.[34] In 1868, as a result of the new Public Health Act, a Municipal Cleansing Department was formally established, replacing a private contractor. In its first year it dealt with 140,240 tons of waste generated by a population of some 395,000, at a cost of just under £11,000 which represented a saving of one third on the contractor's charges for the previous year.[35] By the last financial year before World War II seventy years later, a dedicated workforce of over 600 handled over 423,000 tons from a population exceeding one million, at a total cost of £431,000.[36] The war, perhaps surprisingly, did little to alter the trend towards growth in amounts of waste generated and in costs, and by the time operations had adjusted to peace-time conditions in 1947/48, the scale of work had increased substantially. The Cleansing Department's total workforce then numbered nearly 2,000 with a budget of almost £990,000. That figure was exceeded only by education, health and welfare services[37] and policing, indicating the substantial size and importance of public cleansing in the city's economy. Twelve hundred of the Cleansing Department's workers were employed specifically on the collection and handling of 456,000 tons of assorted refuse from over 288,000 properties at a net cost of almost £580,000.[38]

The organisation for doing all this was substantial, professionally managed (although ultimately politically directed), and far-ranging in its operations. The latter included not just the removal and treatment of refuse, but also what would now be labelled recycling activities. It had many of the characteristics of a large monopoly business enterprise, although the forces driving it were substantially different from the private sector. Between 1945 and the wholesale reorganisation of local government in the early 1970s, its operating costs (effectively its turnover) increased five-fold and the capital invested rose by a factor of 8.5, catering for a client base averaging over a

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[33] *A Review of Public Cleansing in Glasgow from 1868 to 1968* (Glasgow: Corporation of the city of Glasgow, 1968) chapters 1, 2 and 4 give an overview of the pre-1945 period.
[34] Ibid. p. 5.
[35] DTC 7/3/1, (1) Annual Report 1868/69.
[36] DTC/7/31 (5), Annual Report 1938/39.
[37] Health and Welfare was the term that replaced "Public Health" in the City's accounts. It included, *inter alia*, domiciliary midwifery and nursing, health visiting, vaccination, and residential accommodation for the aged and infirm.
[38] Mitchell DTC 7/3/1 (5) Annual Report 1947/48.

million distributed across more than 300,000 households.[39] In Glasgow during this time, waste handling operations not only grew substantially, but also evolved in response to changes in the nature of waste and economic conditions which were outside its own area of control

The department's remit (in common with any other similar municipal organisation) was to collect and dispose of the city's waste in an efficient manner within the budget set by the elected Council. That figure was determined largely by the extent and frequency of the collection service deemed essential, factors which in turn were determined partly by the public health considerations which were the province of the professional managers, and partly by the politically rooted impulse of the elected representatives to satisfy their constituents that they had used public funds prudently to provide a satisfactory service. Financing came chiefly from the general rate fund provided by locally levied rates based on household property values, and this was supplemented to a small extent by grants made by central government. The budget itself was derived from estimates produced by the department's staff and was frequently exceeded, with implications that we shall return to shortly.

Departures from projected expenditure resulted from unpredictable variables affecting the amount of refuse to be collected, none of which were actually susceptible to short-term control. Waste "arisings" from individual households were in effect spontaneous and unpredictable, and their generation was not subject to any practical limitation or regulation. They tended to increase yearly, both in weight and volume, although to a degree unknown in advance, and so the department was essentially reactive rather than proactive in dealing with them. Waste was constantly generated and needed to be removed promptly, an immediate and ever-present problem that created by far the largest part of the Department's expenditure. Bad weather, labour shortages or disputes and (especially in the early post-war years) a lack of efficient disposal facilities all retarded collections and created excess costs through overtime payments or the temporary recruitment of extra workers.[40] There was no alternative to this because it was unacceptable to leave refuse uncollected for more than a short time without generating what were perceived as substantial risks to public health and a strongly negative public reaction.[41] Cost overruns—the equivalent

[39] Extracted from DTC 7/3/1 Annual Reports for financial years 1945/46 to 1971/72.
[40] DTC 7/3/1 Annual Reports, Superintendent's comments, financial years 1945/46 to 1951/52.
[41] Ibid.

of a loss in private sector business—eventually appeared as a deficit in the department's operating accounts and were ultimately met from the Rate Fund account, and eventually these additional expenditures were passed on to the public either in the form of increased rate levies or reduced levels of service elsewhere in the Council's municipal provisions. If expenditure was less than the budget in a given financial year, any surplus was absorbed back into the Rate Fund rather than being credited to the department for the following financial year.

This system of control would seem to imply a recipe for financial laxity with little incentive to run the department with increasing efficiency and where losses would be, to all intents and purposes, written off continually. Although it is hard to counter the idea of a lack of incentive for improving efficiency, the overall financial and audit controls within local and central government acted to rein-in any tendencies towards departmental profligacy and the financial role of managers was principally to estimate costs as accurately as possible.[42] A concomitant skill required of the department's managers was to persuade the politically influenced councillors, who were practically equivalent to the board of directors in a company, to accept what were seen as the necessary costs to be incurred by the department in carrying out its duties, an area which involved not just current or "ordinary" expenditure but also the sometimes very large long-term capital costs involved in sustaining or extending the whole infrastructure of municipal waste handling.

The policies setting out the principles under which the service was run were determined by the elected Councillors with guidance from the professional staff, and the main aim was to provide all residents with at least a weekly removal of their household wastes.[43] This was very much the "public face" of waste disposal and, to the population, by far the most important aspect of it. Any shortcomings in collection standards were immediately apparent, something which taxed management considerably, especially when the service was still highly labour intensive during the 1940s and 50s. The work of collecting refuse bins was always heavy and frequently unpleasant, problems exacerbated by the city's heavy concentration of tenemented properties where, for logistical reasons, collections had traditionally been made at night. Nocturnal working was particularly unattractive, and finding and retaining

[42] Tony Byrne. *Local government in Britain* (Harmondsworth: Penguin Books, 4th ed. 1986) pp. 216-215.
[43] *100 Years of Public Cleansing.* p. 7.

workers was extremely difficult even when unemployment was running at a substantial level.[44] Overcoming the reluctance to work at night on unpalatable and relatively poorly paid work was an intractable problem for which no long-term solution seemed likely during the late 1940s and 1950s. It was recognised that the only effective remedy was a fundamental revision in the organisation and methodology of collection, a course which was governed by an intermeshing complex of political, social and technological factors that shaped the policies proposed by the professionals managing the service.

Political necessity meant that the elected members of the City Council had to provide an acceptable service to the large numbers of people in tenement properties; it was simply not possible to declare the operation uneconomic and abandon it, something which a commercial enterprise would almost certainly have done without hesitation. Here we see an essential difference between the public and private sector arising from differing objectives and systems of governance: accountability to the electorate on the Council's part, coupled with an ethos of social responsibility and professional pride amongst the practitioners, meant that, irrespective of difficulties, the work had to go on. The apparently simple expedient of eliminating night collections in favour of day work was impossible because there was a chronic lack of capacity to deal with all the city's collections should they be concentrated into a normal eight-hour working day. The problem here lay in a bottleneck further up the system of waste handling which the city had constructed over the previous decades. After all, the collection of waste was simply the start of the process of waste disposal: refuse did not evaporate when bins were emptied into carts or lorries. In Glasgow it went on to be sorted, first by removal of inert material such as ash and clinker, and then for "salvage" (i.e. what we would now term recyclables), which was a source of some income generation for the department, after which the remainder was reduced by incineration to further inert ash and clinker. The latter substances were relatively easy to dispose of in the 1940s and 50s since they could be used as road-bedding or to fill-in the disused quarries and mine works to which the city had access. Although there were a number of incineration works in the city, however, a further constraint on collection and disposal was that they had little storage capacity for holding refuse pending incineration, and, because of the works' location in built-up areas, there was

[44] DTC 7/3/5/1 (5) 1951/52, Superintendent's comments, p. 3.

also no prospect for extending it. Thus, delivery times had to be staggered so that material was received gradually across a 24-hour cycle, another key reason for night collections.

The greatest proportion of domestic refuse was handled at one principal location in 1946.[45] This had been opened in 1928 and was a combined facility for separation, incineration of all un-reclaimed matter, and for the generation of electricity as a by-product of the high-temperature burning process. That had been economically viable before the war, with most of the current produced being sold to the city's own electricity supply department or used to charge the storage batteries of the Cleansing Department's own electrically powered vehicles. Post-war changes caused a major re-evaluation of the facility, however, partly because of what were described as "the very objectionable conditions'" endured by the workforce and the population living around the plant. Apart from the regular and sustained emission of considerable amounts of smoke, large dust particles and soot, refuse awaiting combustion was "constantly catching fire" because restricted space necessitated its being held in close proximity to working incinerators. This not only endangered workers and threatened the whole works, but also added to the local air pollution which appears to have bordered on the intolerable. Of equal significance was that the changing nature of the refuse being fed into the furnaces made incineration harder and more costly. The ash and clinker from domestic fires, which then made up a substantial proportion of household waste, had previously included partly burned coal residue, but it now reflected the poorer quality of domestic coal which tended to include a higher proportion of incombustible material, increasing the amounts of fuel needed to start and sustain the furnaces' burning cycle. The costs of running the works and generating electricity rose and the amount of current produced diminished, undermining the economics of production and emphasising the pressing need to reconsider the plant's future. A decision to rebuild the works, taken as early as 1946,[46] was principally the result of commercial pragmatism, with environmental awareness playing what can best be described as a supporting, though doubtless significant, role.

However, progress on rebuilding the works was frustrated because the other smaller disposal plants available were inadequate to handle the city's wastes on their

[45] *100 Years of Public Cleansing.* Chapter 4 provides background material and quotations for this section, and DTC 7/3/1 (5) Annual Reports 1945/46 et seq. comment on the condition of the works and progress towards replacement.

own. The solution adopted was to construct a completely new plant first, in addition to those already in use, which would eventually permit decommissioning and reconstruction of the older site. That decision, taken very soon after the one to reconstruct the existing facility, was part of a broader policy for dealing with anticipated long-term changes in the city's generation of waste, which was expected to increase as a result of plans to build large numbers of new dwellings to replace much of Glasgow's older municipally owned housing which was inadequate or worn-out. Exactly how long the project would take was not anticipated in 1946, and indeed was not acknowledged publicly even after the works was eventually operational in 1958: as late as 1968, it was claimed that work had begun only in 1955, ignoring the long saga of problems that had retarded the project for almost ten years.[47] The worst delays were actually outside the city's control—central government's reluctance to approve the scale and cost of the project caused a delay of six years, for instance, and another delay was caused by the reluctance of contractors to tender at all for the projected work, mainly because no schedule could be given in the absence of government approval.

The delays meant that various developments in other areas of waste production, handling, and management, as well as in business and the economy more generally, called into question the original assumptions which had underpinned the decision to build it. By the time the plant was fully working in late 1958 it was already clear that the generation of refuse was increasing at such a rate that a further incineration works would be needed, even after reconstruction of the older plant. Well before then, in 1956, plans were begun for another facility to cater for only for current demand, but also for what the head of the Cleansing Department described as "the vast new housing development" expected to take place in the City.[48] That project was as protracted as the earlier one; a site was not acquired until 1963 and the specification for the plant not produced until 1966, but this time part of the delay was caused by the realisation among planners that major changes in the nature of domestic refuse and the markets for recyclable materials were compromising the viability of the "separation and incineration" plants. In 1956, it was still expected that the practice of separating collected refuse would continue, with salvaged materials such as ferrous

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[46] DTC 7/3/1 (5) Annual Report 1945/46.
[47] *100 Years of Public Cleansing.* p.
[48] DTC 7/3/1 (5) Annual Report 1955/56, Superintendent's comments.

and non-ferrous metals and textiles being baled and sold on to selected contractors, a labour-intensive operation which nevertheless generated a substantial net return. The design for the works initially followed those principles, but by 1962 it was clear that income from salvage was falling away and showing little profit.[49] Despite this, a complete specification for issue to would-be contractors was virtually complete by the autumn of 1964 when a decision was made to reconsider how the works might best function in the light of emerging trends in waste creation and disposal.[50] In consequence, tenders were also invited for a plant designed to incinerate everything delivered without any attempts at prior separation, leading to further delays.

A decision was eventually made in 1967 to abandon all hand salvage work, and to confine separation to whatever ferrous metals could be recovered by magnets after incineration.[51] Everything that was delivered to the plant would be cremated in the plant, even if material such as non-ferrous metals and cardboard would be lost. This had the attraction of reducing labour costs as well as simplifying the plant itself which, in turn, produced significant capital cost savings. On the other hand, it increased the amount of material being burned and added substantially to the plant's exhaust emissions, although these were factors which at that time were of less immediate political or social concern than would later become the case. It was felt that filters to eliminate dust from the effluent would be a satisfactory solution to objections about pollution.[52]

The final decision to adopt a regime of cremation of all of the waste received in the plants was driven by operational considerations aimed at maximising throughput and minimising both capital and operating costs, considerations which would have been quite at home in any privately operated industrial environment. The aim of the Cleansing Department, though, was not to generate profits, but to minimise the growth in the expense of providing an essential, though ever more financially burdensome, social service. In 1946 its budget was just over £800,000, in 1956 £1.8 million, and in 1966 it was almost £3.4 million – a four-fold increase over a period which saw little inflation of prices. The value of all salvage sales had more than halved in relation to costs in those twenty years, falling from 10.6% of expenditure to

[49] DTC 7/3/1 (5) Annual Report 1962/63, p. 6.
[50] DTC 7/3/1 (5) Annual Report 1963/64, p .5. and Annual Report 1965/66 p. 5. Although the financial year ended on 31 May the Report was not drafted until the early Autumn.
[51] DTC 7/3/1/ (5) Annual Report 1966/67, p. 4.
[52] Ibid.

5.2%, of which over 70 percent actually came from a separate waste paper collection operation.[53] By 1967, whatever attachment there might have been for in-plant waste separation, its economic contribution to cost reduction had all but disappeared and its continuation was no longer justifiable in the context of efficient management, which was increasingly prioritising the disposal of an ever increasing amount of domestic refuse.

The City of Glasgow disappeared as a local government body in 1974. In its final year, the Cleansing Department employed over two and a half thousand workers and handled 304,135 tons of refuse with a budget of almost £8 million out of the city's total spending of £222.7 million, i.e. 3.59% of the total. The cost of managing domestic waste was exceeded in non-revenue accounts only by the Police Service (£14.63 million) and Education (£69.34 million), and these costs had remained substantially similar in relation to one another throughout the period after 1945. The preliminary examination of Glasgow's records, along with some of the national data for England, strongly suggest that municipal waste management bodies had much in common with large commercial enterprises, certainly in respect of their size and complexity of operations, as well as their ultimate duty of financial responsibility to supervisory bodies, although clearly those supervisory bodies had different objectives and composition than those in the private sector. The problems of policy formulation and labour supply and relations were clearly apparent, as well as the early recognition that domestic waste was an issue which had the potential to raise national issues concerning its disposal.

Conclusions

These early investigations have been both stimulating and challenging. They show that—at least in one case—municipal waste management was a convoluted operation that embraced many issues that we face today, although of course contemporary perceptions came from a different perspective, and they suggest that it may be necessary to revise at least some of our own initial conceptions of the industry's structure and operations prior to the emergence of an active commercial sector in domestic waste management. So far, we have only looked at the public sector governance of domestic waste handling, but even here we see as an important

[53] Figures extracted from DTC 7/3/1 (5) Annual Reports for those years.

issue the question of whether Glasgow was typical of municipal practice or whether the authority was actually *sui generis*, and – if so – then why? The bulk of the work is still to do on the UK case, and we have yet to begin sustained work on the German one. Apart from making comparative studies of a selected sample of UK local authorities, we have yet to examine the effect of central government's role in shaping the nature of municipal waste control through legislation and political encouragement. The important issue of how private enterprise came to be melded into the "big picture" during the 1980s—in particular in relation to the privatisation question—has also still to be addressed, as has the matter of how public and private governance affected both the qualitative and quantitative performance of collecting and disposing of refuse. How, for instance, did commercial operators reconcile the need to discharge socially essential tasks with attaining efficient economic performance? To what degree were companies reliant on recruiting managers from the public sphere in order to extend their operations? Was the organisation of the burgeoning private waste management industry modelled on a municipal model, or was it derived from existing business practices?

There are, at this point, more questions than answers, and the mechanics of answering them may also be complicated because the commercial sector has been characterised by the fluidity of its constituent population: mergers and take-overs have been commonplace, companies have vanished entirely or their identities and records subsumed into others. Much documentation is likely to have been lost, although individuals' oral evidence may partly bridge the gaps. We are, though, encouraged by results of the research carried out so far, which indicate that the business-historical and comparative approach will provide new and fruitful historical perspectives on a pressing contemporary problem at the intersection of political economy, corporate governance, consumer society, and the environment.