# Private Need, Public Order: Urban Sanitation in Late Medieval England and Scandinavia

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A Dissertation presented to the Graduate Faculty
of the University of Virginia in Candidacy for the Degree of
Doctor of Philosophy

Department of History

University of Virginia
May 2008

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# Abstract

This study investigates the workings of late medieval sanitation technologies, particularly how solutions to sanitation issues were constructed as a relationship between the city government and urban inhabitants. It argues that medieval sanitation developed through the reciprocal interaction between physical conditions and complex social systems. The available technologies and environmental demands prompted the development of certain social arrangements at the city level such as the growth of specialist sanitation jobs, collection of taxes and direct participation of residents. At the same time, social arrangements enabled some technological choices such as the provision of ward dung carts and river cleansing operations. In other words, some forms of city governmental organization resulted from the demands of material conditions of urban life and, likewise, physical sanitation technologies depended on governmental structures to be effective.

The dissertation defines the roles of city corporations and individuals in several sanitation issues, primarily street maintenance, waste management, and river cleansing from roughly 1350 to 1600 in England and Scandinavia. A transnational perspective is employed to identify broader trends that characterize sanitation in northern late medieval cities. The written evidence relies heavily, although not exclusively, on the city council records from the Swedish city of Stockholm and English cities of Coventry, Norwich, and York. In addition to the written sources, the evidence includes archeological finds from a wide array of cities in Scandinavia (the areas which today are Denmark, Norway, and Sweden) and England.

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# Acknowledgements

Any scholarly work is a product of many behind-the-scenes supporters. To begin, I would like to thank Dr. Lee Lowery of Texas A&M University, who told me once while I was working on my bachelor's in civil engineering that I needed to become a professor – it didn't matter in what field. I've kept that statement close to my heart and it inspired me to return to graduate school after several years of environmental engineering practice. Second, I express my gratitude to Chris Hamlin, who gave me the idea to look at leet records for sanitation concerns when I visited Notre Dame before I began my PhD. Without his suggestion, none of this would have happened. Next, I have to thank the core group of professors at University of Virginia who supported my work and provided useful comments throughout the process: Bernie Carlson, Ed Russell, Duane Osheim, and Jack Brown. They exposed me to new ways of thinking about history, particularly the juncture of environmental and technological histories.

This dissertation was financially supported by many different organizations: the University of Virginia, a National Sciences Foundation grant through University of Virginia's Committee for the History of Environment and Technology, the American-Scandinavian Foundation, and the Norwegian Research Council. In addition, the University of Virginia, the American Society for Environmental History, the European Society for Environmental History, and the Society for the History of Technology

provided travel funding to present conference papers. Presenting papers is an invaluable part of graduate education and dissertation preparation, so I heartily applaud their support.

Closer to home, I want to thank my husband Finn Arne, a historian and friend. He has read more about medieval sanitation than anyone should have to. He has always provided insightful comments and suggestions. And when I needed dedicated time to write, he took care of our daughter Marion and our dog Mumford. Entertaining them was not always an easy chore, so I thank him for his help. It's been a whirlwind four years, including marrying Finn Arne, moving to Norway, and giving birth to my two babies – Marion and this dissertation. It's been the best time of my life.

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# Connections

The newly elected mayor of Coventry, John Leeder, stood before the city council on January 25, 1421 and issued a proclamation. In his statement, which takes up four manuscript leaves on front and back, Leeder addressed typical urban concerns: the price of bread and ale, the sale of rotten meat, the forestalling of grain, the use of weapons in town, and the council's oversight of crafts and guilds. But in addition to these commercial regulations, the mayor's proclamation addressed a series of sanitary issues. Cooks were forbidden to cast filth under their tables or into the street. Swine were not permitted on the high street; swineherds were required to drive them only to unused fields outside of the city. Butchers were not allowed to slaughter animals other than swine within the city walls. No one was to throw dung from stables or other refuse into the river, onto a neighbor's property, into the city ditches, or into the street. Residents had to carry dung to three named spots outside of the city gates for disposal and always have a cart ready when moving organic waste. Every man was required to clean the street pavement in front of his house or shop door every Saturday. Everyone who lived on the river was to scour and cleanse the bank so that during flood times, the water could more easily pass through the channel. All manmade canals taking water from the river should be stopped up. All latrines along the city ditch were to be removed and those who owned

property along the ditch were to cleanse it.[1] When the mayor voiced these wide-ranging sanitation concerns, he revealed the extent to which medieval city councils were directly involved in providing livable urban conditions to residents.

Medieval sanitation developed through the reciprocal interaction between physical conditions and complex social systems. The available technologies and environmental demands prompted the development of certain social arrangements such as the growth of specialist sanitation jobs, collection of taxes and direct participation of residents. At the same time, the social arrangements enabled some technological choices such as the provision of ward dung carts and river cleansing operations. In other words, some forms of governmental organization resulted from the demands of material conditions of urban life and, likewise, physical sanitation technologies depended on governmental structures to be effective.[2] Medieval governments and the fabric of urban life were thus connected and changed in dialog with one another.

This study investigates the workings of late medieval sanitation technologies on the ground level. It will define the roles of city corporations and individuals in sanitation issues, primarily street maintenance, waste management, and river cleansing during the period from roughly 1350 to 1600 in England and Scandinavia. I have undertaken the

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[1] *The Coventry Leet Book: or Mayor's Register, Containing the records of the City Court Leet or View of Frankpledge, A.D. 1420–1555, with Divers other matters*, ed. Mary Dormer Harris, four parts (London: Kegan Paul, Trench, Trübner & Co., 1907–1913), pt. 1, 23–33.

[2] Gideon Sjoberg made a similar observation in *The Preindustrial City: Past and Present* (Glencoe, Illinois: The Free Press, 1960): "Technology both requires and makes possible certain social forms. This viewpoint does *not* commit us to technological determinism, however, for recognized is the impact upon social structure of other variables – the city, cultural values, and social power – all of which can affect the patterning of technology itself. … Technology is not some materialistic, impersonal force outside the socio-cultural context or beyond human control; technology is a human creation par excellence." (7)

study from a transnational perspective to identify broader trends that characterize sanitation in northern late medieval cities. The written evidence relies heavily on the city council records from the Swedish city of Stockholm and English cities of Coventry, Norwich, and York. In addition to the completeness of the city records, these locations have several things in common: they were all provincial market centers; their populations ranged from around 5,000 to 12,000 for most of the period under study; the city government was dominated by a mayor and council; and unlike their continental counterparts, they did not use older Roman sanitation infrastructure. London with its population of 40,000 to 50,000 in 1400 was the anomaly in the northernmost reaches of Europe and is thus excluded from this study.[3] By using urban areas of a smaller size, rather than the metropolis of London, I hope to illuminate the sanitation technology management schemes in more typical urban centers. In addition to the written sources, I have included archeological evidence for sanitation from a wide array of cities in Scandinavia (the countries which today are Denmark, Norway, and Sweden) and England. As this work will show, both English and Scandinavian cities employed similar social and technological approaches to sanitation and treating both areas together

[3] London has already received significant scholarly attention in the area of medieval sanitation. See Ernst L. Sabine, "Butchering in Mediaeval London," *Speculum* 8.3 (Jul 1933): 335–53; Ernst L. Sabine, "Latrines and Cesspools of Mediaeval London," *Speculum* 9.3 (Jul 1934): 303–21; Ernst L. Sabine, "City Cleaning in Mediaeval London," *Speculum* 12.1 (Jan 1937): 19–43; Caroline M. Barron, *London in the Later Middle Ages: Government and People 1200–1500* (Oxford: Oxford University Press, 2004), Chapter 10, "The Urban Environment;" and Roberta Magnusson, "Water and Wastes in Medieval London," in *A History of Water*, vol. 1, *Water Control and River Biographies*, ed. Terje Tvedt and Eva Jakobsson, 299-313 (London: I. B. Tauris, 2006). These authors investigate sanitation through legal records of complaint including the London House Books and Assize of Nuisance records. The focus here on cities with less than 15,000 inhabitants does not mean that they were obscure places. As Sjoberg points out, medieval food technology could not support cities of extremely large populations and cities of closer to 10,000 can have important historic roles. Sjoberg, *Preindustrial City*, 81–83.

broadens our understanding of larger patterns in environmental concern in the later Middle Ages.

In this analysis of city government and sanitation development from 1350 to 1600, I have chosen to cross the boundary of the "late medieval" and "early modern" eras, dated to sometime between 1500 and 1550, adhered to in the works of many scholars. The changes in city governance approaches were gradual and reflect a much longer struggle than using traditional dividing lines would allow. In this way, I am following the example of Marjorie McIntosh's excellent study of controlling social misbehavior from 1370 to 1600 to draw a broader picture of historical changes.[4] The typical division between medieval and early modern is based on religious changes related to the Reformation in the second quarter of the 1500s and/or political shifts such as the beginning of Queen Elizabeth's reign in 1558. These movements, although they certainly had an impact on the justifications for sanitation, did not radically alter the way cities dealt with the physical problems of urban life, which is the primary concern of this work.[5]

I am particularly interested in how solutions to sanitation issues were constructed as a relationship between the city government and urban inhabitants. For this reason, I

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[4] Marjorie McIntosh, *Controlling Misbehavior in England, 1370–1600* (Cambridge: Cambridge University Press, 1998).

[5] Paul Slack has tied the motivations of moral restrictions as well as cleanliness concerns in the 1500s to two different philosophical ideas: the common weal and godly cities. First, the concerns were tied to the idea of "decay," the opposite of order. Decay, including filth in the streets, was thought to bred corruption and disease in society, thus harming the common weal or general well-being. In the language of religious reformers, ordinances controlling rubbish in the streets along with drunkenness, idleness, playing cards, and similar misbehavior were enacted "to the glory of God and well ordering of this commonwealth." See Paul Slack, *From Reformation to Improvement: Public Welfare in Early Modern England* (Oxford: Clarendon Press, 1999), Chapters 1 and 2.

will not be addressing royal decrees about sanitation measures, although one could certainly examine changes in the delegation of sanitation responsibility from royal to local officials.[6] The main questions are: How did local governments interact with their urban environments? What kind of services, such as paving, street cleaning, and waste pickup, did the city provide? How integrated were citizens into sanitation measures? How did involvement by inhabitants and government officials affect sanitation choices? These questions focus on the ways in which medieval societies crafted social relations and harnessed technologies to create functional environmental systems.

In this introductory chapter, I will offer some background information on the scholarly discussion about urban sanitation and the available sources for medieval sanitation concerns. This dissertation rests heavily on interpretation of medieval legislative and judicial records, thus it is necessary to discuss the problems and potential of these sources. The main issue revolves around whether these sources should be read "positively," as evidence of cultural norms in favor of sanitary behavior, or "negatively," as signals that the average person was content to live in unsanitary conditions.

Before going further into this analysis, I want to clarify my use of the term "sanitation" in this work. I label medieval measures to manage waste disposal locations,

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[6] The English royal government, for example, was involved in highway maintenance through pavage grants. The king's patent rolls record numerous cases in which the English crown gave towns or individuals the right to collect tolls on goods coming into the urban area or via a particular route in order to pay for highway maintenance. Often these grants were specifically for paving of rural highways between market centers. King Richard II also issued a royal statute in 1388 requiring city governments to clean up dung and other garbage disposed of improperly in their urban areas: 12 Richard II c13, *The Statutes of the Realm*, vol. 2 (London, 1816, reprint 1963), 59–60. Miriam Carole Davis has compared the interest in sanitation of the king and city governments in both the pre- and post-plague periods: "The English Medieval Urban Environment: Learned Views and Popular Practice" (PhD dissertation, University of California, Santa Barbara, 1994).

pave and clean streets, and scour rivers and ditches as sanitary actions. In her study of English royal and municipal approaches to the urban environment, Miriam Carrol Davis points out that medieval acts did not directly involve sanitation in the modern sense of the word until very late in the period and cautions against equating medieval actions with those of more well-known nineteenth-century sanitary reformers.[7] Yet I disagree. The Oxford English Dictionary defines "sanitation" as "the devising and application of means for the improvement of sanitary conditions" and "sanitary" as "of or pertaining to the conditions affecting health, esp. with reference to cleanliness…" The citations for these definitions show that the words themselves appear first in Great Britain around 1842 in association with urban reform efforts.[8] But it would be wrong to discount the efforts of the medieval councils simply because they did not understand public health in the same way that later city reformers, like Edwin Chadwick, would. Melosi defined "sanitary services" in his introduction to *The Sanitary City* as services which "provide water for domestic and commercial uses, eliminate wastes, protect public health and safety, and help to control forms of pollution."[9] As we will see in later chapters, the concrete actions that the late medieval city councils took to regulate, collect, and manage wastes should be seen as nothing less than sanitary services under these definitions. The government officials recognized uncleanliness (see Chapter 2) and devised means for improving the

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[7] Davis, "The English Medieval Urban Environment."
[8] *Oxford English Dictionary Online*, s.vv. "sanitation," "sanitary," http://dictionary.oed.com/cgi/entry/50213062 and http://dictionary.oed.com/cgi/entry/50213058 (accessed 26 January 2008).
[9] Martin Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore: Johns Hopkins University Press, 1999), 1.

situation (see Chapters 3-6). They did not act exclusively because of health concerns, but they did act to protect the public's interest. Therefore, I do not believe it is anachronistic to use the word "sanitation" when describing medieval cleansing activities.

## *Sanitation in Medieval Urban History*

Modern urban sanitation has been a topic of much recent historical analysis.[10] Martin Melosi is the most renowned current scholar in the field with his books, *Garbage in the Cities* and *The Sanitary City*, on American national trends in urban sanitary service delivery.[11] He stresses the influence of public health and ecological theory in sanitary service decision-making, the role of professionals (engineers, physicians, politicians) in service implementation, and the environmental effects of service choices. In a similar vein, Joel Tarr argues that sanitary service provision leads to unintended consequences, such as running water for drinking purposes making flush toilets more available thus increasing the urban sewage load.[12] Both of these scholars highlight the role of technology in sanitation provision and the obduracy of these technological systems. These are issues that apply to medieval times as well.

For European cities, there has been no similar comprehensive analysis of sanitary system provision, but Dale Porter (*The Thames Embankment: Environment, Technology,*

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[10] For a discussion of the importance of studying urban areas in environmental history as a whole, see Martin Melosi, "The Place of the City in Environmental History," *Environmental History Review* 17.1 (Spring 1993): 1–23 and Christine Meisner Rosen and Joel Tarr, "The Importance of an Urban Perspective in Environmental History," *Journal of Urban History* 20.3 (May 1994): 299–310.

[11] Martin Melosi, *Garbage in the Cities: Refuse, Reform, and the Environment, 1880–1980* (College Station: Texas A&M University Press, 1981) and *Sanitary City*.

[12] Joel Tarr, *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective* (Akron, OH: University of Akron Press, 1996).

*and Society in Victorian London*) and Donald Reid (*Paris Sewers and Sewermen: Realities and Representations*) have written marvelous studies on the interplay of sanitary ideas, technical infrastructure, and the urban environmental condition in the nineteenth century.[13] Both works point out how cultural constructions of cleanliness factor into the decision-making process and highlight the role of the state in sanitation projects. Although the medieval sanitary undertakings were not of a comparable size, they nevertheless show the same influence of cultural norms and governmental intervention.

In these treatments of modern sanitation, as well as in the general medieval historical literature, early modern and medieval predecessor cities are typically characterized simply as dirty, filthy places.[14] Melosi, for example, characterizes medieval attempts to address waste as "primitive" and public resistance as "strong." For Melosi and others, the "service revolution" began in the mid to late nineteenth century as burgeoning population and intensive industrial activities created never-before seen levels of pollution. To these scholars, city sanitation services before this time provided "no

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[13] Dale H. Porter, *The Thames Embankment. Environment, Technology, and Society in Victorian London* (Akron, OH: University of Akron Press, 1998) and Donald Reid, *Paris Sewers and Sewermen: Realities and Representations* (Cambridge, MA: Harvard University Press, 1991).

[14] Examples of this attitude toward the medieval city are found in both medieval history and environmental history literature. The Victoria County History for York starts its paragraph discussion of sanitary conditions in the medieval city with the sentence: "The sanitary condition of the streets, however, appears to have improved not at all since the 13th century." P. M. Tillott, ed., *A History of the County of Yorkshire: the City of York* (London: Victoria County History, 1961), http://www.british-history.ac.uk/source.asp?pubid=183, 107. The history of technology encyclopedia edited by Charles Singer begins the discussion of medieval sanitation after an extended treatment of the virtues of ancient Roman sewage systems with the comment that "in the Middle Ages conditions were certainly worse…" Charles Singer et al., eds., *A History of Technology,* vol. 2 (Oxford: Oxford University Press, 1957), 531–33. Sjoberg quotes a book from 1948 saying "…butchers and poulterers were by no means alone in their careless disposal of animal refuse; fishmongers and cooks and the ordinary households were all guilty…The private citizen was only too ready to dispose of dead dogs and cats by dropping them into the river or just over the town wall, or even by placing them in any open space …" (*Preindustrial City*, 93).

adequate solution."[15] Although scholars are right in situating the nineteenth century changes within a new concept of public health, their ideas of medieval sanitation are drawn by reflecting the deplorable condition of the nineteenth century back onto the Middle Ages. If things were bad in 1800, how much worse must they have been in 1500?

When interpreting records about cleanliness in the medieval city, modern scholars are often presentist, interpreting medieval life in terms of modern technological standards. It is particularly easy to think that the cities were dirty because medieval households lacked flush toilets and functioned without engineered landfills. But such a position is untenable, because although the services provided in the late medieval city were low-tech, they were generally appropriate to the density and layout of medieval cities and to the environmental concerns and social relations of their residents. Cities had grown tremendously by 1800 while the sanitation technologies had changed little since the Middle Ages. It was only in the later industrial age that the solutions became insufficient and inoperative. In the fourteenth through sixteenth centuries, then, the lack of complex technology to manage waste does not mean that it was indiscriminately handled.

As this dissertation will show, waste dumped in the streets, left by the city gates, or thrown in the market was considered unacceptable, just as it would be by a modern

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[15] Melosi, *Garbage in the Cities*, 5–9. In addition to Melosi, see also Tarr, *Search for the Ultimate Sink*. Cf. Lewis Mumford's observation in *The City in History* (New York: Harcourt Brace Jovanovich, 1961), 290: "The point to note, in coming to a judgment on medieval towns, is that crude sanitation is not necessarily bad sanitation; for a medieval farmhouse, in which the common dung pile was the only domestic privy, was not as great a menace to its inhabitants' health as the progressive pre-Pasteur town of the nineteenth century, blessed with refined water-closets in every middle-class dwelling, and cursed by a supply of drinking water drawn from the same river into which the sewage of the town above was emptied."

inhabitant of the town. The fact that complaints about improper waste handling appear in the records means that when individuals were acting outside of accepted norms, the community became concerned. Records, then, document struggles to define proper waste handling and how city governments attempted to cope with violators. Medieval urban sanitation services may have been more robust than generally assumed.

The medieval historian Lynn Thorndike wrote an article in 1928 proposing that the medieval city was not nearly as dirty as modern writers would make it out to be through a cursory look at some of the city statutes about cleanliness in France, Germany, and Italy.[16] At the end of his article, Thorndike included a call for serious research into the sanitary condition of the medieval city. Ernest L. Sabine picked up on this suggestion and wrote three articles in the 1930s about London's urban pollution.[17] They are admirable for their revelation of the concern for cleanliness in the medieval city and explication of the practical steps taken by the city government to sanitize London. Sabine finds that London's public latrines served both transient businessmen as well as residents without access to private latrines. City officials expected residents to use the public facilities rather than throwing excrement and urine in the streets, as is evident in complaints brought against those who behaved otherwise. The bridge masters financed repairs to the public latrines on London Bridge on several occasions. Sabine also observes that both public and private latrines were often situated over running water to take away waste and that the city government tried to curb construction of such latrines

[16] Lynn Thorndike, "Sanitation, Baths, and Street-Cleaning in the Middle Ages and Renaissance," *Speculum* 3.2 (Apr 1928): 192–203.
[17] Sabine, "Butchering"; "Latrines and Cesspools"; and "City Cleaning."

because of watercourse blockages.[18] These early twentieth century scholars saw the efforts of medieval authorities as positive signs of the sanitary state of the medieval city.

More recent scholarship on waste in the medieval city has rejected this positive view, instead seeing injunctions against waste disposal as evidence of uncleanliness. In 1982, the medieval urban historian Derek Keene wrote a brief article dealing with the issue of rubbish disposal in the documentary sources.[19] The article was published in an edited volume about medieval urban archeology with the intent to show the value of the documentary record for archeological investigations of waste deposits. Keene argues that

> the mass of documentation and its repetitious character show not only that by modern standards English medieval towns were extremely dirty places in which to live and work, but also that both municipal authorities and others had a self-conscious concern for the appearance and smell of their towns and made serious attempts to cope with the problems of cleansing.[20]

Although Keene recognizes the sincerity of the authorities' efforts, he unequivocally believes their efforts failed. In *Straws in the Wind: Medieval Urban Environmental Law – The Case of Northern Italy* Ronald Zupko and Robert Laures assume the sanitation laws of northern Italy indicate the bad sanitation condition of the cities rather than being positive signs of urban cleanliness. They conclude that the efforts by medieval elites to

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[18] Sabine, "Latrines and Cesspools," 306–11.
[19] Derek Keene, "Rubbish in Medieval Towns," in *Environmental Archeology in the Urban Context*, ed. A. R. Hall and H. K. Kenward (London: Council for British Archeology, 1982), 26–30. For an extended analysis of housing conditions and a brief discussion of the condition of Winchester's medieval streets, see also Derek Keene, "The Medieval Environment in Documentary Records," *Archives* 16.70 (1983): 137–44.
[20] Keene, "Rubbish in Medieval Towns," 26.

clean up the urban environment were "incomplete, sporadic, and sometimes misguided" like throwing straws into the wind.[21] This dissertation proposes a different reading of the sources than the recent work, returning to the proposition by Thorndike that cleanliness statutes indicate a genuine concern for the urban environment and were more effective than modern historians assume.

One of the major shortcomings of previous analysis of medieval sanitation in the English-speaking community is that it has been considered almost exclusively as a legal matter and not a physical one.[22] Even T. P. Cooper's 1912 article on York which appeared in an archeological journal, included almost no archeological evidence to support his sweeping claim that "the thoroughfares and byways of towns and cities were loathsome and deep with offensive matter, and were a constant danger to health and life."[23] His most extended discussion is on the physical remains of gutter systems, but even this shows only that gutters eventually drained to the river (which would be expected for any kind of rain drainage system!), not that they were filled with rubbish. There has been, however, one attempt to integrate physical findings into discussions of medieval sanitary services: Roberta Magnusson employs physical evidence alongside the

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[21] Ronald E. Zupko and Robert A. Laures, *Straws in the Wind: Medieval Urban Environmental Law – The Case of Northern Italy* (Boulder, CO: Westview Press, 1996), 111.

[22] Sanitary conditions as a legal issue received some attention at the beginning of the twentieth century: T. P. Cooper, "The Mediaeval Highways, Streets, Open Ditches, and Sanitary Conditions of the City of York," *The Yorkshire Archaeological Journal* 22 (1912): 270–86; Thorndike "Sanitation, Baths, and Street-Cleaning"; Sabine, "Latrines and Cesspools"; and Sabine, "City Cleaning." Zupko and Laures, *Straws in the Wind*, looks exclusively at legislation from the late medieval Italian city states. For sanitary conditions in medieval France, see André Guillerme, *The Age of Water: The Urban Environment in the North of France, A.D. 300–1800* (College Station, TX: Texas A&M University Press, 1988) and Jean-Pierre Leguay, *La Pollution au Moyen Age* [Pollution in the Middle Ages] (Paris: Editions Jean-Paul Gisserot, 1999).

[23] Cooper, "Mediaeval Highways," 271.

textual in her discussion of medieval water supply systems in *Water Technology in Medieval Europe*. Unfortunately, her discussion of the relationship between water technologies and waste (or sanitation writ large) is very cursory.[24] The problem with the general lack of inclusion of physical remains in the sanitary discussion is that without it, we fail to see how the medieval systems would have actually functioned in place and how effective they might have been.

Physical evidence has been much more integrated in the work of Scandinavians looking at urban sanitation, particularly because of the paucity of written sources. Scandinavian archeologists have extensively analyzed urban archeological investigations for changes in sanitary infrastructures, including roads, gutters, and latrines.[25] These scholars tend to emphasize the frequent finds of sanitary provisions such as paved roads and lined latrines after 1400 in Scandinavian urban areas. In her analysis of a complex network of stone-lined latrine vaults and street cleaning patterns in Visby, Sweden, Gun

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[24] Roberta Magnusson, *Water Technology in Medieval Europe* (Baltimore: Johns Hopkins University Press, 2001). She includes a brief discussion of waste disposal practices and street cleaning in the late medieval city, see pages 155–62.

[25] For example, Anders Andrén, "I städernas undre värld" [In the cities' underworld], in *Medeltiden och arkeologin: Festskrift till Erik Cinthio* [The Middle Ages and archeology: essay collection in honor of Erik Cinthio], ed. Anders Andren et al., 259–70 (Lund: Lunds universitets historiska museum, 1986); Hannah Dahlerup Koch, "Middelalderens gader" [Medieval streets], in *KUML 2000: Årbog for Jysk Arkæologisk Selskab* [KUML 2000: Yearbook of the Jutlandish Acheology Association], ed. Jesper Laursen, 284–86 (Aarhus: Aarhus Universitetsforlag, 2000); Lena Beronius Jörpeland, "Den grå vardagen – standing och renhållning i den medeltida staden" [The grey everyday life – cleaning and refuse removal and disposal in the medieval town], *Bebyggelsehistorisk tidskrift* 42 (2001): 59–74; Bård Gram Økland and Knut Høiaas, *Bare boss? Håndtering av avfall i Bergen gjennom 1000 år* [Only trash? Handling of waste in Bergen for 1000 years] (Bergen: Bryggen Museum, 2000); and the articles in Manfred Gläser, ed., *Lübecker Kolloquium zur Stadtarchäologie im Hanseraum IV: Die Infrastruktur* [The Lübeck colloquium on city archeology in the Hansa League IV: the infrastructure] (Lübeck: Verlag Schmidt-Römhild, 2004). Inge Torstenson, a forklore specialist, has also written on Oslo's historic waste handling practices: Inge Torstenson, *Fra nattmann til renholdsverk: Avfall og renovasjon i Oslo gjennom tusen år* [From nightman to public sanitation department: Waste and renovation in Oslo through a thousand years] (Oslo: ProArk, 1997).

Westholm argues, for example, that there must have been coordination and planning of Visby's urban construction from the mid-thirteenth century (although who did this coordination is not known because of the lack of written records). In her conclusion she says, "people of the Middle Ages both desired and managed to solve street cleaning and waste disposal. So there is reason to question the current image of mediaeval urban environment. Our concept of filthy medieval towns is probably a myth based more on exceptions rather than the rule."[26] This is the general conclusion reached by most of the Scandinavian archeologists, although Westholm makes the point most forcefully. Because these archeologists have generally written their findings in Danish, Norwegian, or Swedish, their conclusions have not been incorporated into larger urban histories written in English.

Sanitation is in fact a very practical, material matter. This dissertation thus incorporates both written and physical evidence to reveal *how* legislated issues worked (or failed to work) in practice. This approach aligns with archeologist John Moreland's contention that both objects and texts were "actively used in the production and transformation of identities; they were used in the projections of, and in resistance to, power; and they were used to create meaning in, and to structure, the routines of everyday life."[27] Moreland advocates the symmetrical treatment of written and physical

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[26] Gun Westholm, "Sanitary infrastructure in Mediaeval Visby – Waste Disposal and Town Planning," in Gläser, *Lübecker Kolloquium IV Die Infrastruktur*, 502. See also Gun Westholm, "Två städer: Sanitär infrastruktur i Visby och Tallinn under medeltid" [Two cities: Sanitary infrastructure in Visby and Tallinn in the Middle Ages], in *Från stad till land. En medeltidsarkeologisk resa tillägnad Hans Andersson* [From city to nation: A medieval archeological journey dedicated to Hands Andersson], ed. Anders Andrén, Lars Ersgård, and Jes Wienberg, 253–62 (Stockholm: Almquist & Wiksell, 2001).

[27] John Moreland, *Archeology and Text* (London: Duckworth, 2001), 80.

evidence even in questions of law, politics and administration. Because the scholars working from two different evidentiary basis, written and physical, have tended to come up with opposite conclusions about the provision and effectiveness of medieval sanitation for their case studies, I have tried to reevaluate the evidence as a whole.

None of the previous studies deal explicitly with how the city governments responded to urban sanitation needs and how those decisions affected government itself. In the medieval urban history literature, sanitation and its role in governmental development is scarcely mentioned. In the *Cambridge Urban History of Britain*, the most important survey text on English urban history, John Schofield and Geoffrey Stell contributed the article on the urban built environment 1300 to 1540 and they included one paragraph discussing the provision of city latrines in Exeter in Southwark and one sentence on street cleaning.[28] Göran Dahlbäck's contribution of towns in the late medieval period in Scandinavia discusses the political development of towns but not their infrastructure.[29] Although these survey texts do have a lot of ground to cover, their lack of discussion about sanitation reveals how marginalized the topic is.

Even those texts which focus on daily life and material culture say little about sanitation. Keith Lilley's *Urban Life in the Middle Ages 1000–1450* includes a lengthy discussion of city government formation but only mentions that civic authorities enforced

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[28] John Schofield and Geoffrey Stell, "The Built Environment 1300–1540," in *The Cambridge Urban History of Britain*, vol. 1, *600–1540*, ed. D. M. Palliser (Cambridge: Cambridge University Press, 2000), 378.

[29] Göran Dahlbäck, "The Towns," in *The Cambridge History of Scandinavia*, vol. 1, *Prehistory to 1520*, ed. Knut Helle, 611–34 (Cambridge: Cambridge University Press, 2003).

street cleaning laws in the section on artisans.[30] Christopher Dyer devotes three pages to sanitation issues in *Standards of Living in the Later Middle Ages*, acknowledging the role of urban authorities in dealing with environmental problems, but the discussion is only cursory.[31] This is not to say that sanitation has been completely forgotten. Caroline Barron has dedicated an entire chapter in her book on late medieval London to the urban environment, including sanitation. She is most concerned with describing the environmental conditions in London, and does not extend the analysis to discuss the interplay between governmental structures and urban environmental issues.[32] For a slightly later period than this dissertation, Walter King explores the regulation of dung disposal in the seventeenth-century small town of Prescot, England. He mentions the foundation of several new governmental posts to inspect for proper dung handling techniques, but he does not discuss them at any length.[33] The general histories of Scandinavian cities such as Bergen and Stockholm almost always include a discussion of street cleaning activities, street paving and waste disposal practices, but offer little analysis of these activities.[34] Paul Slack's *The Impact of Plague in Tudor and Stuart England* comes closest to illuminating the government-urban environment connection. Slack shows how the physical problem of plague prompted particular governmental

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[30] Keith D. Lilley, *Urban Life in the Middle Ages 1000–1450* (Palgrave: New York, 2000).
[31] Christopher Dyer, *Standards of Living in the Later Middle Ages: Social Change in England c. 1200–1520* (Cambridge: Cambridge University Press, 1989), 189–92.
[32] Barron, *London in the Later Middle Ages,* Chapter 10, "The Urban Environment."
[33] Walter King, "How High is too High? Disposing of Dung in Seventeenth-Century Prescot," *Sixteenth Century Journal* 23.3 (1992): 443–57.
[34] See for example, Göran Dahlbäck, *I medeltidens Stockholm* (Stockholm: Stockholms medeltidsmuseum, 1987), 114–16 and Knut Helle, *Bergen bys historie*, vol. 1, *Kongssete og kjøpstad fra opphavet til 1536* (Bergen: Universitetsforlaget, 1982), Chapter 9.

responses at the national and local levels and these led to increasingly complex monitoring systems. Because authorities at the time rarely associated sanitation issues with outbreaks of disease, Slack does not discuss waste handling or street cleaning in any detail. So the connection between these services and local governmental change is still unexplored.

## *The Beginning?*

This is not a story about origins. Many historians are obsessed with identifying the "beginning" of something, but, as Marc Bloch cautioned, this is not always a fruitful endeavor.[35] This is particularly true in the field of environmental history where many researchers have tried to identify the origins of the modern environmental movement (Rachel Carson, Earth Day, and the image of earth from space are natural contenders, although many look further back to John Muir and environmental romanticism) and the first sanitation efforts (Edwin Chadwick and the New York Sanitation Department are favorites).[36] The problem with trying to find the "first" is that the parameters change over

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[35] Marc Bloch, *The Historian's Craft*, trans. Peter Putnam (Manchester: Manchester University Press, (1954) 1992), 24–29.

[36] For literature exploring the roots of modern sanitation, see Christopher Hamlin, *Public Health and Social Justice in the Age of Chadwick* (Cambridge: Cambridge University Press, 1998); Martin Melosi, *Effluent America: Cities, Industry, Energy and the Environment* (Pittsburgh: University of Pittsburgh Press, 2001); Pierre Claude Reynard, "Public Order and Privilege: Eighteenth-Century French Roots of Environmental Regulation," *Technology & Culture* 43.1 (Jan 2002): 1–28; and Tarr, *The Search for the Ultimate Sink*. Examples of scholarship identifying origins of the modern environmental movement in various forms include Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement*, revised ed. (Washington, DC: Island Press, 2005); Samuel Hays, *Conservation and the Gospel of Efficiency* (Cambridge, MA: Harvard University Press, 1959); Roderick Nash, *Wilderness and the American Mind*, 4th ed. (New Haven: Yale University Press, 2001); and Adam Rome, *The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism* (Cambridge: Cambridge University Press, 2001). Lynn White, Jr. has also claimed that Christian dogma formed the roots of the

time. If we count sincere interest in maintaining viable landscapes as part of the definition of environmental awareness, then "environmentalism" stretches way back in time to the colonial period, according to Richard Grove, or even the Greek civilization, according to Donald Hughes.[37]

Looking for the origins of something as complex and socially-determined as sanitation is risky. For example, in *Straws in the Wind*, Zupko and Laures argue that the sanitation ideas developed in Italian cities were "carried by scholars, ecclesiastics, and politicians into continental European and English cities, where they were absorbed and refined to meet the particular needs of those local environments."[38] They are convinced that Italian cities developed ideas about sanitation which were then transported to the rest of Europe. The problem is that they present no evidence of this migration. The city legislation they examine is indeed early – the statutes of Bassano are from 1259, 1276 for Verona, 1287 for Ferrara, 1296 for Spoleto – but does that mean they were the first and thus copied? The Statutes of the Guild, originally enacted in Berwick c. 1249 and then adopted in all Scottish cities, contain an ordinance against filth, which says that anyone placing filth, dust or ashes on the common streets, in the market-place, or on the banks of the Tweed River shall be fined eight shillings as forfeit.[39] So here we have a sanitation

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"modern environmental crisis" in "The Historical Roots of Our Ecological Crisis," *Science* 155 (10 March 1967): 1203–7.

[37] J. Donald Hughes, *Pan's Travail: Environmental Problems of the Ancient Greeks and Romans* (Baltimore: Johns Hopkins University Press, 1996) and Richard Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism* (Cambridge: Cambridge University Press, 1995).

[38] Zupko and Laures, *Straw in the Wind*, 5.

[39] *Ancient Laws & Customs of the Burghs of Scotland*, vol. 1, *1124–1424*, ed. Cosmo Nelson Innes (Edinburgh: Printed for the Scottish Burgh Records Society, 1868), 72.

law earlier than the ones Zupko and Laures analyze. Does that mean that the Italian cities, in fact, copied this Scottish law? Obviously not. The Norwich Leet court records for 1287-88 also contain several fines for creating muckheaps in the street.[40] Because of the fines, we know that disposing of dung in the street was considered an illegal activity in Norwich at the same time that it was deemed illegal in the Italian cities. Should we try to figure out who was first? It is actually impossible to do so because the Norwich Leet records from the 1280s are the earliest surviving ones; the court existed before then, but the records have been lost. Instead of looking for origins, I would argue that we should recognize that these types of laws all address the same fundamental problems of urban life.

The problem of urban sanitation and responses to it is precisely what this dissertation attempts to analyze. I do not claim that England and Scandinavian responses are unique. In fact, I think that quite the opposite is true. The sanitation actions taken by the cities studied here should be read as representative of late medieval cities. Why should this be so? The physical fact is that urban waste poses the same basic challenges regardless of the city. Waste needs disposal and the options available in the late medieval city were limited – it could be left onsite, thrown in a pit, cast into a water body, or reused as fertilizer. With limited technologies available for handling waste, it should not

[40] For example, Robert was presented for making a muckheap in the street so that carts could not pass, Roger Benjamin was fined 2s. for a muckheap in which he had buried offal, and Stephen the Carter was fined 2s. because he cast putrid ox-flesh on the land of Matthew Brown. There are other similar entries for this year. *Leet Jurisdiction in the City of Norwich during the XIIIth and XIVth Centuries*, Seldon Society, vol. 5, ed. William Hudson (London: Bernard Quaritch, 1892), 11, 23, and 28.

be surprising that similar tactics developed across Europe to address the issue at about the same time.

## *Sources for Medieval Sanitation*

Working with medieval sources to explore urban sanitation has some inherent limitations. Although the availability of written sources increases after 1350, the records are still spotty and give us only occasional glimpses into medieval life in each city. Therefore, this work combines the primary records and archeological evidence from several different urban centers in England and Scandinavia. The written records focus on Coventry, Norwich, and York, England and Stockholm, Sweden because of the survival of relatively complete city council meeting minutes from the fifteenth and sixteenth centuries.[41] Sporadic written records from a few other cities, including Nottingham, England and Bergen, Norway, supplement these primary foci.

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[41] These late medieval city council records have for the most part been transcribed from the original medieval manuscripts and published. For Coventry, *Coventry Leet Book* contains the semi-annual council proceedings. There is one known court roll for Coventry; it has been published as "Extract of Fines and Amercements 1540–41" in Levi Fox, "Some New Evidence of Leet Activity in Coventry 1540–41," *English Historical Review* 61.240 (May 1946): 235–43. For York, several volumes recorded complaints brought before the council and legislation passed in the city. These have been published in several different sets: *York Memorandum Book, lettered A/Y in the Guidhall Muniment Room*, 2 parts, ed. Maud Sellers (Durham, UK: Andrews & Co., 1912 and 1915); *York Memorandum Book (B/Y)*, ed. Joyce W. Percy (Gateshead, UK: Northumberland Press, 1973); *The York House Books 1461–1490,* 2 vols., ed. Lorraine C. Attreed (Wolfeboro Falls, NH: Alan Sutton, 1991); and *York Civic Records*, vols. 2–6, ed. Angelo Raine (York: Yorkshire Archaeological Society, 1940–1948). *The York Bridgemasters' Accounts*, ed. Philip M. Stell (York: York Archaeological Trust, 2003) records financial transactions related to the town bridges and *York City Chamberlains' Account Rolls 1396–1500*, Surtees Society, vol. 192, ed. R. B. Dobson (Gateshead, UK: Northumberland Press, 1980) records regular city expenditures. For Norwich, extracts from various city registers have been printed in *The Records of the City of Norwich*, 2 vols., ed. W. Hudson and J.C. Tingey (London: Jarrold & Sons, 1906 and 1910). Some of Norwich's court records are printed as *Leet Jurisdiction in the City of Norwich*. Stockholm's council proceedings have been published in a series of volumes titled *Stockholms stadsböcker från äldre tid*, andre serien, *Tänkeböcker*, 1474–1591, 13 vols., eds. Emil Hildebrand, Gottfrid Carlsson, and Johan Axel Almquist (Ivar Hæggströms: Stockholm, 1917–

The medieval governments of these cities[42] developed into powerful civic authorities during the two hundred years from 1350 to 1550. Stephen Rigby has noted that the fifteenth century in England was "a period of literate civic self-awareness."[43] City governments actively monitored trade activities, hosted religious festivals highlighting civic authority and pride, and collected taxes from residents. The number of surviving court books and records dramatically increases after 1350 because of the growing interest in documenting civic statutes that confirmed the city as a legal entity outliving the individual elites who participated in the government. The actual organization of civic government differed from city to city but most had a ruling council with a presiding mayor that exercised both judicial and legislative authority. As a judicial body, the medieval council heard misdemeanor presentments, levied fines, and received capital pledges for minor offenses. In the legislative arena, the council issued ordinances founded on bills presented to the mayor by any individual or group who wished to voice a grievance or amend common practice. Aldermen sat on the council representing specific sections of the city, known as wards. Although the governmental structure of these medieval cities was quite flexible in the fifteenth and sixteenth centuries, the city council was the consistent governing body and aldermen served as the backbone of local

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1939). Citations to these primary sources are given with the volume (if appropriate) and the page number in the printed version of the text.

[42] I refer to the urban centers in this study as "cities." Although they were not as populous as many continental cities such as Paris, Cologne, Florence, and Rome, I have opted to call them "cities" because they were the largest urban centers in their respective regions, other than London, and the medieval governmental elites consistently refer to their own urban area as a "city" (often as "Citee" or "Cite" in the English texts, "staden" in the Swedish texts, and "civitas" in Latin passages) in the written records.

[43] Stephen Rigby, "Urban 'Oligarchy' in Late Medieval England," in *Towns and Townspeople in the Fifteenth Century*, ed. John A. F. Thomson (Gloucester: Alan Sutton, 1988), 62.

government.[44] In both its judicial and legislative roles, the council tackled the environmental issues of the late medieval town in conjunction with residents, as later chapters will demonstrate.

In Coventry, the organizational structure was dominated by the court leet. The leet usually met twice a year at Easter and Michaelmas[45] both to execute justice and pass legislation. The mayor and a council of twenty-four reviewed submitted petitions before the day of the assembly and controlled their inclusion or exclusion from the leet proceedings. It appears that the council was not popularly elected by citizens, but rather selected by the mayor, perhaps with advice from other council members. Coventry was divided into four wards. The governmental structure of Coventry was quite flexible in the fifteenth and sixteenth centuries, consisting of various roles and positions that could grow and shrink over the years. The court leet was, however, a consistent legislative force in the town. The proceedings of this court were recorded in the *Coventry Leet Book*. The volume contains 436 numbered leaves, the bulk of which record the mayoral elections and court sittings between 1421 and 1555.[46]

York had a Court of Mayor and Alderman which issued civic ordinances and administered the law through fines and arrests. There were several concentric circles of government around the mayor who stood at the center: a council of 12 aldermen, a council of 24 men, and a *communitas* of 48 men representing the community at large.

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[44] Mary Dormer Harris, introduction to *Coventry Leet Book*, pt. 4, xvii–xxvii. Town councils originated before 1350, but written records are sparse before that time, so little can be said about their character. The early 1400s witnessed a formalization of duties and roles of the council officers.
[45] The Easter leet met in March or April and the Michaelmas leet met in late September or October.
[46] Harris, introduction to *Coventry Leet Book,* pt. 4, xi–xii, xvii–xxvii.

There were multiple lower courts, including a court of wardmote, which was a jury of twelve or more men who heard nuisance complaints such as failure to pave the streets and lanes of the city.[47] The *York Memorandum Books A/Y* and *B/Y* record ordinances related to the guilds and trade, property deeds, and tax collection amounts beginning in 1377. In 1461, the city began keeping a new set of documents titled the *House Books*, which stress municipal activities and legislation instead of craft regulations.[48]

Norwich's government was similar to York. Norwich received a royal charter in 1404 permitting the annual election of a mayor. A ruling elite of 24 alderman and an outer circle of 80 (later reduced to 60) councilors joined the mayor in the leading city positions. Six aldermen represented each of Norwich's four wards regardless of size; the common councilors were proportionally assigned based on population with the largest ward having the most representatives. It is worth noting that the commonality (the large body of common councilors) had to approve of all actions of the mayor and aldermen for them to be valid.[49]

Stockholm was also governed by a council, but instead of a mayor, the highest office was shared by four burgomasters (*borgmästare*). The council consisted of around 24 sitting councilors (*rådmän*) who were elected to 3-year terms. Two chamberlains (*kämnärer*) chosen from among the councilors handled the city finances. Because of

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[47] Francis Drake, *Eboracum: or the History and Antiquities of the City of York, from its Origin to this Time*, vol. 1 (York: T. Wilson and R. Spence, 1788), 259–61; Tillott, *City of York*, 75–79.
[48] Joyce W. Percy, introduction to *York Memorandum Book (B/Y)*, vii–viii; Lorraine Attreed, introduction to *York House Books*, vol. 1, xii.
[49] Ruth H. Frost, "The Urban Elite," in *Medieval Norwich*, ed. Carole Rawcliffe and Richard Wilson (London: Hambledon and London, 2004), 236–37.

Stockholm's significant German merchant population, half the positions were given to Swedish and half to Germans each year. The city scribe recorded the council's dealings in Stockholm's *Tänkeboken*, literally "memory book."[50]

In addition to the documentary evidence from these specific cities, this dissertation includes physical evidence unearthed in archeological digs to expose the physical nature of medieval sanitation. The archeological evidence comes mainly from Norwegian, Swedish and Danish locations, with some support from York and Norwich excavations. Scandinavian archeologists have extensively analyzed urban archeological investigations for changes in sanitary infrastructures, including roads, gutters, and latrines, making their work particularly relevant to this study.[51] Because of the physical nature of sanitation, the archeological evidence is just as important as its written counterpart for seeing medieval sanitation systems at work.

Unfortunately, the written and physical traces of sanitation are not evenly distributed and we do not have archeological investigations that exactly correlate with the city council material. Therefore, I employ evidence from sites in an intermingled fashion. This is not to downplay the historical development of any one particular place, but rather to expose the common approaches to urban sanitation during the period. The common urban forms, both socio-politically and structurally, of the cities in England and Scandinavia allow this eclectic approach.

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[50] Dahlbäck, *I medeltidens Stockholm*, 56–63.
[51] See footnote 21.

## *Elites, Commoners, and the Common Good*

One of the greatest challenges of the archival source material for this project is the limited number of voices who speak. All of the city council documents are written from the point of view of the elites who sat on the council. In addition, court records often exist when individuals were cited for misbehavior, which might imply that sanitation was only an elite concern. Were the elites of medieval cities the only ones were interested in sanitation?

The Norwich council texts certainly indicate that some of the urban population disobeyed "the goode and godly" sanitation laws passed by the city government. The counselors believed that such "sturdye and disobedyent persons" deserved to be punished.[52] Sanitation efforts were not free and the council believed that "great gredynes and obstinacy" led to failure to uphold previous sanitation laws.[53] Disobedient persons existed, and in fact, could be identified because they stood out from the crowd. The "yll-disposed persons" contrasted with "godemen" of the city who kept the ordinances.[54]

Violations of sanitary laws are recorded in several of the city books, sometimes listing actual fines levied on and paid by environmental lawbreakers.[55] A few examples

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[52] *Records of the City of Norwich*, vol. 2, 128.
[53] *Records of the City of Norwich*, vol. 2, 133.
[54] *Coventry Leet Book*, pt. 3, 631 and *Stockholms Stads Tänkeböcker 1514–1520*, 288.
[55] Fines are given in the text in the original monetary units. The English monetary units were: £1 (pound) = 20s. (shillings); 1s. = 12d. (pence); 1 mark = 2/3 pound = 13s. 4d. The Swedish monetary units were: 8 öre = 1 mark. It is difficult to give an indication of the modern equivalent of late medieval currency values. For England, we can compare amounts to likely wages. Skilled building worker earned a daily wage of 4d. in 1400 and 6d. in 1500. If a worker was employed 200 days in 1400 (a liberal estimate in the late medieval labor market), he would have made £3 6s. 8d. Daily wage value from Dyer, *Standards of Living in the Later Middle Ages*, xv. In 1563, the York council listed the permissible daily wages for skilled building workers: in the summer months, they received 8d. per day or 4d. per day plus meat; in the winter they got

will suffice. Nic. Hermansson paid 2 of the 12 marks he owed to Stockholm's city council because his servants had laid filth in the Big Market and Andres Staffansson paid 4 of the 12 marks he owned for throwing waste in the Greyfriar's neighborhood.[56] Coventry's court fined the plumber Walter Lacy 4d. for casting dung and filth into the gutter near St. John's Wall and the carrier William Shawe 12d. for throwing dung on the street outside of New Gate.[57] In 1551, the court of Norwich fined Thomas Nycoll 3s. 4d., the churchwardens of St. Gregory parish church 6d., Mr. Hubberd 8d., George Herryson 3d. and the Chamberlains 8d. for laying timbers and muck in the street.[58] The city councils, then, not only passed sanitation regulations, but enforced them, at least on some occasions. The violations certainly indicate that the regulations were not always followed, but these texts give no indication that *all* citizens failed to follow sanitation laws.[59]

The enforcement of sanitation laws appears to align with a general increasing concern for social stability from urban inhabitants. In Marjorie McIntosh's seminal *Controlling Misbehavior in England, 1370–1600*, she argues convincingly that general

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1d. less per day. Other urban laborers received 5d. per day or 2d. per day plus meat. *York Civic Records*, vol. 6, 58-60. For a discussion of labor seasonality, worker mobility, and average number of working days, see Simon A. C. Penn and Christopher Dyer, "Wages and Earnings in Late Medieval England: Evidence from the Enforcement of the Labour Laws," *Economic History Review*, 43.3 (1990): 356–76. In Stockholm, the 1460 tax records show that over half of the citizens paid less than 4 öre in annual taxes. The highest taxed amount was 12 marks. For comparison, a grown sheep cost 3½ öre and a keg of beer was 6 to 7 öre. Dahlbäck, *I medeltidens Stockholm*, 51.

[56] *Stockholm Tänkeböcker 1474–83*, 220 and *Stockholm Tänkeböcker 1483–92*, 133.

[57] "Extract of Fines and Amercements 1540–41," 238, 239.

[58] *Leet Jurisdiction in the City of Norwich*, 89.

[59] For example, only 3.8 percent of the 1,659 leet citations of Norwich 1288–1391 were for nuisance and obstruction (the category of waste violations), meaning there were only 63 cases. This is very small compared to other categories like violations of the Assize of Bread and Ale with 362 cases. Philippa Maddern, "Order and Disorder," in Rawcliffe and Wilson, *Medieval Norwich*, 196.

concern for social misbehavior increased gradually between 1370 and 1600 in England. Although her study focuses on moral crimes clustered under four headings (Disharmony, Disorder, Poverty, and Gaming) and does not include pollution offences, her conclusions have applicability to this study.[60] She made two important observations about the frequency of reported crimes. First, she found that "regulation formed part of a complex network designed to resolve conflict and curtail behaviors deemed socially harmful."[61] Within this network, local actions often preceded any royal authority to enforce communal behavior because of community concern for order. "Regulation of social misconduct by the lesser public courts was by no means a simple 'top down' phenomenon. If a type of behavior was causing trouble in their community, local jurors reported it, whether or not they had been authorized to do so."[62] Sanitation citations, then, can be read as the local government responding to behavior considered harmful by the community as a whole. Second, McIntosh found that misbehavior was enforced more often in market towns, particularly those on navigable waterways or a long-distance road. In these market centers, a large population and common presence of strangers led to much more concern about social offences.[63] The government had to exercise more control over the larger urban populations to maintain social order. Because all of the cities included in this study are larger market locations, a similar predisposition to

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[60] In *Controlling Misbehavior*, McIntosh examined public court proceedings from 255 villages and small towns in her studies. Although these communities are smaller than the ones under consideration here, the city council sources also show heightened awareness of misconduct and attempts to regulate behavior.
[61] McIntosh, *Controlling Misbehavior*, 7.
[62] McIntosh, *Controlling Misbehavior*, 39.
[63] McIntosh, *Controlling Misbehavior*, 144–58.

reporting crime would be expected. When householders and shop owners used the streets as a waste disposal location, the government officials viewed it as "contrarie to all good rule of the Citee," indicating a broad concern for city rule.[64]

Clearly the cities' leading men cared about sanitation, but did others? The existing literature on sanitation generally assumes that records of sanitation laws and fines for violations indicate that the average citizen in the medieval city possessed little concept of cleanliness in the modern sense. Alain Corbin, for example, argues that the elite ideas about smell and deodorization faced an uphill battle against the will of the masses: the populace was indifferent to smells and only in the late eighteenth century do we finally notice a "reduced threshold of tolerance" for smell from decomposing corpses and cesspools.[65] The French historian of technology Andre Guillerme also believes that medieval prohibitions against human waste in the streets "were handed down by municipal authorities who most likely had sanitary facilities themselves. The bans were rarely respected by the masses, for whom excrement was part of everyday existence; neither its sight nor smell provoked disgust."[66] Yet we should not too easily adopt this view for two reasons: first, it was common people who often brought issues before the mayor and city council and the courts and second, medieval city officials tended to act within culturally accepted norms.

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[64] *Coventry Leet Book*, pt. 3, 631–32.
[65] Alain Corbin, *The Foul and the Fragrant: Odor and the French Social Imagination*, trans. Miriam Kochan (Leamington Spa, UK: Berg, 1986), 57–59.
[66] Guillerme, *Age of Water*, 166.

First, it was often commoners who brought cases before the courts, which does show that they were concerned about urban sanitation. Medieval city councils most often acted in response to complaints brought before them. In Coventry, we know that individuals and groups submitted petitions and bills about sanitation matters to the council. For example, in 1426, the common men of the Crosscheaping ward submitted a petition to appoint keepers for the city's water conduit.[67] Individuals raised protests against neighbors who blocked up street drains with their household waste or disposed of offal in abandoned land. This is most obvious in the court records from Norwich and Nottingham. For instance, in 1375, neighbors of the Norwich barber Adam de Hindringham complained that he was constantly laying muck in the highway to their detriment.[68] In Nottingham, the Mickletorn Jury heard numerous complaints from commoners about those who had illegally dumped dung or wastewater in the streets. The jury even cited the Common Sergeant for not keeping the streets clean (i.e. enforcing the law) and the Chamberlains for not ensuring the pavements in town were properly mended.[69] From these city records, we know that nuisance complaints of this kind were regularly brought by urban residents.

Second, local government officials rarely acted outside of the community's best interest. As Lorraine Attreed argues in her study of English late medieval urban

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[67] *Coventry Leet Book*, pt. 1, 104–5.
[68] *Records of the City of Norwich*, vol. 1, 383.
[69] *Records of the Borough of Nottingham being a series of extracts from the archives of the corporation of Nottingham*, vol. 3, *King Henry VII to King Henry VIII 1485–1547* (Nottingham: Corporation of Nottingham, 1885), 344. For presentments of waste disposal violators, see for example the Mickletorn Jury presentments of 13 October 1407 (vol. 2, 39ff) and 11 April 1512 (vol. 3, 338–40).

government, we should not see city officers as merely self-interested oligarchs. They were, in fact, constrained by social norms to act in the best interest of the community: "The principles that underlay those constraints placed a high value on civic harmony in the face of inevitable inequality. As Norwich's Composition of 1415 stated, the object of civic government was the establishment of peace, unity and accord."[70] The civic officials took actions as part of their duty to create a harmonious community. As Stephen Rigby observes, "Harmony in town life was not, however, only thought to arise from the just rule of the better sort and from obedience by the commonalty. It was also seen as the result of town government which was both constitutional and representative."[71]

The councilmen provided good governance of the city to maintain social harmony. For example, a 1451 petition presented to the Coventry leet (the presenter is not named in the record) calling for the renewal of city defenses and cleansing of ditches linked the responsibility for maintaining urban infrastructure with the city council who acted for "goode gouernaunse & rule."[72] The authorities felt obliged to respond to this petition because of their social role as governors. Similar petitions prompted councils to pass bylaws against illegal dumping, appoint officials to conduct regular inspections of suspect improper disposal areas, fine violators; designate areas for waste disposal, require waste separation and reuse, and fund weekly waste removal carts to go through the city. Officials acted within "town custom," acting as the representatives of the community and

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[70] Lorraine Attreed, *The King's Towns: Identity and Survival in Late Medieval English Boroughs* (New York: Peter Lang, 2001), 44–45.
[71] Rigby, "Urban 'Oligarchy' in Late Medieval England," 65.
[72] *Coventry Leet Book*, pt. 2, 257.

rarely performed actions contrary to general communal standards. Thus we can conclude that sanitation efforts and regulations are indicative of more general public sentiments about cleanliness in the city.

## *Outline of Chapters*

We can see from the above discussion that the relationship between local government and sanitation has been to date relatively unexplored territory; yet the provision of sanitation services often factored into city council actions and influenced local governance strategies. The following chapters will discuss this relationship in detail, highlighting the interplay among urban environmental challenges, technological choices, and civic government.

I begin in Chapter 2 by examining the physical and social setting of the medieval city, particularly the conception of waste at the time. The chapter will show that in the medieval city, dirt, or more broadly the "unclean," was defined by physical properties of sight and smell. Cultural norms established certain behaviors with dirt as unacceptable. I take up the cases of excrement handling in Chapter 3 and urban livestock in Chapter 4 to demonstrate the physical pressures of urban life and how the civic governments intervened in sanitation measures. The cultural norms established in Chapter 2 prompted the city councils to take measures controlling the disposal of excrement, thereby moving what might have been a private affair into the sphere of public control. Chapter 5 builds on this concept to examine the relationship between civic regulations and urban

industries. The records show that city governments regulated salubrious and water-contaminating industries because of the physical environmental effects.

The following two chapters look more directly at the types of governmental and social changes prompted by sanitation provision. The civic government did not act alone in providing sanitation services. Chapter 6 uses the case of street and river maintenance to expose the roles of both civic government and individual citizens in sanitation service provision. Because the city had simple technologies to maintain roads and rivers, a complex relationship of responsibility developed to ensure adequately functioning systems. Chapter 7 then examines in detail the way local officials modified governmental structures in order to provide sanitation services. The physical nature of the environmental issues led to delegation of the civil services closer and closer to the physical problems, increasing the complexity of the civic governments. The final chapter offers some summarizing remarks about the relationship between private need and public order in the medieval city through the lens of sanitation.

# 2

# Defining Dirt

Dong, filthe, fattes, muke, wede, dust, swepyng, stuffe, ramell.[1]

The council of Coventry identified these wastes as harmful to the local river at one time or another. The names come from legislation aimed at curbing improper disposal practices. When the councilmen employed these terms, they were talking about "dirt," or as Mary Douglas so memorably described it, "matter out of place." Although Douglas' discussion centered on spiritual and ritual purity and defilement, her identification of chaos as a result of dirty things and order created by the clean is useful in the realm of sanitation history.[2] Pollution in the environmental sense is disorder – things being in the wrong place.[3] Pollution regulation, then, is the environmental equivalent to the religious taboos Douglas discusses. The sanitation regulations of the late medieval city tried to create order, and perhaps impose morals.

As we approach the subject of sanitation and waste regulation in the late medieval city, we need to discuss the possible motivations for sanitation measures and the cultural

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[1] See *Coventry Leet Book* entries for the years 1421, 1426, 1429, 1444, 1469, 1473, 1475, and 1480 for some instances of these words in context (pt. 1, 23, 107, 118, 208; pt. 2, 347, 388, 417, 445).

[2] Mary Douglas, *Purity and Danger: An Analysis of the Concepts of Pollution and Taboo* (London: Routledge & Kegan Paul, 2nd impression with corrections 1969 [1966]).

[3] I use the word "pollution" in the modern sense as an undesirable state of the natural environment because it is contaminated with harmful substances, rather than the spiritual and ritual meaning of pollution. In the Middle Ages, the word "pollution" would have had only the spiritual meaning, since the environmental sense of the word pollution originates in the nineteenth century, according to the *Oxford English Dictionary Online*, s.v. "pollution," http://dictionary.oed.com/cgi/entry/50183004 (accessed 26 January 2008). This does not, however, mean that people in medieval times failed to recognize environmental contamination, as this chapter and the following ones will show.

place of waste in the medieval city. Why would city councils be interested in sanitation? What were the motivations behind their actions? Although definitive answers are hard to come by, the physical challenges of the medieval urban space clearly shaped their viewpoint. By discussing the wastes generated in the city, the constraints of the urban space and possible reasons for sanitation concern arising from this situation, we set the stage for later chapters that delve into types of sanitation regulation in detail.

## *Labeling Wastes in a Medieval City*

Waste, the primary pollution in the medieval city, came in many physical forms. The names for wastes in the medieval texts are not always as precise as modern scholars would like, but we can get some idea of the waste type by examining the terms in context. Understanding what types of wastes the medieval residents faced will help us to see how those wastes might have caused particular problems in the urban setting.

First, there were biological wastes, including both human and animal excrement. Animal feces are often called "dung" or "muck," although both words may also refer to human waste.[4] Muck was also used for waste mixed with mud cleaned out of ditches.[5] The remains of slaughtered animals, called "offal" or "entrails," regularly appear in

[4] According to the *Oxford English Dictionary Online*, dung rarely means human excrement (OED, s.v. "dung, n.", definition 2, http://dictionary.oed.com/cgi/entry/50070850), but in 1421, the Coventry mayor's proclamation included a prohibition of throwing "dong out of hur housis" (*Coventry Leet Book*, pt. 1, 23). This may refer to human waste because if it meant animal waste, then the passage would have likely said "dong of hur stablez" which is the wording used later in the same proclamation (*Coventry Leet Book*, pt. 1, 29).

[5] After a ditch cleansing operation, the sergeant had to get a "Carte to voide all the muk lying in the Mych-parke-strete at ye Red-dich" (*Coventry Leet Book*, pt. 2, 361) and grates were permissible over the ditch to "kepe out muk" (*Coventry Leet Book*, pt. 3, 622).

passages dealing with butchers.[6] "Dust" or "sweepings" originated in houses and likely consisted of straw, mud, food leftovers, shop waste such as sawdust, and perhaps some feces. Men of the countryside apparently collected dust and sweepings (in one Norwich entry called "compass," a derivative of the word "compost") for fertilizer.[7]

The quantity of biological waste generated by urban inhabitants was significant. According to estimates based on the medieval diet, the "typical" medieval person excreted approximately 250 grams or milliliters of feces per day, and an additional 800 milliliters of urine.[8] For a city with a population of 10,000 like the ones under consideration here, this equates to 912,500 liters of human feces per year (912.5 cubic meters) and 2,920,000 liters of urine (2,920 cubic meters). Large livestock kept within the city added considerably to the waste totals. One horse might have generated about 1.8 cubic meters of manure a year, so if only five percent of urban dwellers kept a horse, the 500 horses would have generated 900 cubic meters of dung per year. Added to that were the cattle who each contributed about 2.9 cubic meters per year and pigs who averaged 0.5 cubic meters per year. When all of the contributions are totaled, for a city of 10,000 persons, 500 horses, 500 pigs, and 500 chickens, as well as 5 cows and 25 sheep/goats

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[6] *Coventry Leet Book*, pt. 1, 42–43, 108; pt. 2, 271–72, 389, 389. In York, the texts about butchers and entrails are written in Latin or Middle French. Therefore, the terms are different, but the meaning is the same: "fumere qe issuz de lour bestes" [waste issued from their beasts] (*York Memorandum Book*, pt. 1, 15, 17–18) and "intestina bestiarum" [animal intestines] (*York Memorandum Book*, pt. 2, 70).

[7] *Records of the City of Norwich,* vol. 2, 141–43 (spelled "duste" and "cumpas" in the entry). Explicit references to fertilizing with house sweepings also appears in a Coventry entry: sweepings had been "carryed a-wey be men of the Contrey to donge their londe" (*Coventry Leet Book*, pt. 2, 447)

[8] All waste quantities in this section are derived from Kathy Pearson, "Waste and Waste Disposal in the high and late Middle Ages: an Examination of the Technical Problems of Human and Animal Waste and Medieval Solutions," paper presented at International Congress of Medieval Studies, Kalamazoo, Michigan, 2006. My thanks to Dr. Pearson for providing a copy of her paper.

brought into town for slaughter each day, the hypothetical estimate is 5,390 cubic meters, which would create a pile 17.5 meters (52.5 feet) on all sides. Such massive quantities could not be easily ignored in a walled city with relatively little vacant land. Using this waste as agricultural fertilizer would have been an excellent way to remove it from the urban center.

Next, there were physical remnants of activities such as construction work and craft production. Construction debris, termed "ramell" in the medieval sources, appears several times.[9] Craft wastes could be named precisely, such as cinders and paste from dyers, or simply called filth.[10] We have no estimates for the quantities of these wastes, but they must have been quite common as evidenced by the inclusion in many sanitation laws and archeological finds of craft waste pits.

The word "filth," a generic waste term, signified foul matter, corruption, and rottenness.[11] It appears regularly along with other waste terms such as dung as well as standing alone as a general term for all unclean things.[12] It was employed in Coventry to mean the waste (possibly human sewage) coming out of a channel into the ditch.[13] In the

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[9] Ramell was often listed along side of dung, probably because the two names represent inorganic and organic wastes generally. For example, the Prior of Coventry Cathedral complained that people were mixing "ramell" in with their dung and sweeping of the houses making the waste unusable as fertilizer (*Coventry Leet Book*, pt. 2, 447); "fylthe or ramell or teym any bests baggez" (*York Civic Records,* vol. 3, 59); and "fylth, ramell nor dong" (*York Civic Records,* vol. 3, 95).

[10] *Leet Jurisdiction in the City of Norwich*, 70, 73, and 75.

[11] See *Oxford English Dictionary Online*, s.v. "filth, n.," http://dictionary.oed.com/cgi/entry/50084813.

[12] Some examples of filth as an all-encompassing waste term: "cast no dong of hur stablez, ne non othur fylthe" (*Coventry Leet Book*, pt. 1, 31); "no maner man cast no muke nor wede, ne no maner of filth" (*Coventry Leet Book*, pt. 1, 107–8); "eny dust, donge, swepyng or eny other fylthe" (*Coventry Leet Book*, pt. 2, 347); "avoiding of the ffilthie and vile mater" (*Records of the City of Norwich,* vol. 2, 110); "cast eny manner of fylth, ramell nor dong" (*York Civic Records,* vol. 3, 95); and "all the fylth there ligheng to be caried away" (*York Civic Records,* vol. 5, 53)

[13] *Coventry Leet Book*, pt. 3, 728–29.

Swedish texts, waste is called "uncleanliness" (*orenlighet*) instead of a particular name for the type of waste. In one case, dung and uncleanliness appear as two waste types ("dynge eller orenlighet"), but we should not take this to mean that *orenlighet* usually excluded dung.[14] The usage of *orenlighet* was commensurate with the usage of the term filth as a generic, all-encompassing word for waste. Waste was that which was unclean.

In this sense, filth was put in opposition to cleanliness. Douglas observed that society creates dirt as a "by-product of a systematic ordering and classification of matter, in so far as ordering involves rejecting inappropriate elements." She employed the example of shoes themselves not being a dirty object, but they become dirty if placed on the dining room table: "Our pollution behaviour is the reaction which condemns any object or idea likely to confuse or contradict cherished classifications."[15] Filth, then, is that which transgresses understood social and physical norms.

In this sense, filth must be understood as at threat and a danger to those labelling it filth. As William Cohen states, "filth is a term of condemnation…That which is filthy is so fundamentally alien that it must be rejected."[16] Labelling something as dirty is not socially neutral; it is often discriminatorily based on race, economic level, age, etc.[17] So when the medieval city officials responded to filth in their midst, they did so within a

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[14] *Privilegier, resolutioner och förordningar för Sveriges städer*, vol. 2, *1523–1560*, ed. Ernst Nygren (Stockholm: Stadshistoriska institutet, 1932), 352.
[15] Douglas, *Purity and Danger*, 35–36.
[16] William Cohen, "Introduction: Locating Filth," in *Filth: Dirt, Disgust, and Modern Life*, ed. William Cohen and Ryan Johnson (Minneapolis: University of Minnesota Press, 2005), ix.
[17] See for example Elizabeth Shove, *Comfort, Cleanliness & Convenience: The Social Organization of Normality* (Oxford: Berg, 2003), 88–89; Martin F. Manalansan IV, "Immigrant Lives and the Politics of Olfaction in the Global City," in *The Smell Culture Reader*, ed. Jim Drobnick, 41–52 (Oxford and New York: Berg, 2006); and Suellen Hoy, *Chasing Dirt: The American Pursuit of Cleanliness* (Oxford: Oxford University Press, 1995), Chapter 4.

social construct of filth as the opposite of order and propriety. We saw in Chapter 1 that city councils were increasingly concerned with moral and social order from 1350 to 1600. Their usage of the term filth as waste not handled within acceptable social norms aligns with these larger concerns.

## *Waste as Nuisance*

English texts often termed activities contrary to the public good as "nuisances." A "nuisance" in legal parlance was something harmful or offensive to the public or an individual, especially unlawful interference with an individual's enjoyment of his or her rights, whether they were rights to land, safety, or comfort. Public nuisances included activities such as highway obstruction, carrying on an offensive trade, and selling food unfit for human consumption. The word "nuisance" was not, however, used exclusively in the legal sense; it also connoted "a thing or action considered obnoxious or harmful because of its unsightliness, obstructiveness, smell, etc." even if not contrary to any law.[18]

Both the legal and extended sense of nuisance had obvious application to the disposal of waste in the medieval urban setting. The *Oxford English Dictionary* even uses the example "to urinate or defecate in a public place" as an action constituting a nuisance of the legal kind.[19] The legal use of "nuisance" is most prevalent in Latin texts where it is rendered *nocumentum*. For example, in 1374, the Norwich Leet fined John de Gissing for

[18] Based on definitions 2a and 2b of "nuisance," *Oxford English Dictionary Online*, http://dictionary.oed.com/cgi/entry/00328277.
[19] Definition 1a of "nuisance" from *Oxford English Dictionary Online*.

dumping 100 cartloads of muck on a small island in the middle of the river. This act was considered a "nuisance of the river" (*ad nocumentum ripe*).[20] When the York council commanded the butchers to relocate their washing of entrails, it was so that it would no longer be a nuisance to the Friars Minors (*sine nocumento predictorum fratrum*).[21]

Middle English city council records said that a particular practice was "annoying" instead of calling it a nuisance. Both people and the environment could be annoyed by waste disposal. The Coventry council called sewers running into a ditch "noyaunces" when they ordered them removed.[22] The casting of muck and filth into the street gutters and ditches "annoyed" the gutters.[23] In 1552, the Norwich records included a list of trades which harmed the river, calling them "common noyeours," and said they could be fined to whatever degree was deemed right for their "common annoyaunce."[24] Muckheaps were "noyeing" to people walking by.[25] An annoyance thus interfered with an individual's enjoyment of safety and/or comfort, calling for the interference of the city government to control the nuisance.

Unfortunately, the records are rarely clear about the reason that a particular waste practice was considered a nuisance or annoyance. In order to figure out why councils would have thought of certain disposal practices as nuisances, we need to analyze the texts of the regulations in light of the physical and cultural context of the period.

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[20] *Leet Jurisdiction in the City of Norwich*, 65.
[21] *York Memorandum Book*, pt. 2, 70.
[22] *Coventry Leet Book*, pt. 3, 622.
[23] *Coventry Leet Book*, pt. 3, 631. The streets of Norwich were also "annoyed" by dust and dung left in the streets. *Records of the City of Norwich*, vol. 2, 141.
[24] *Records of the City of Norwich,* vol. 2, 129.
[25] *Leet Jurisdiction in the City of Norwich*, 89; also *Records of the City of Norwich,* vol. 2, 122.

## *Why Care about Uncleanliness?*

So what were the motivations for legislating sanitation in late medieval towns? Douglas proposed that cultures create taboos to combat anomalies, for example killing twins or avoiding certain foods. Certain practices are labeled as dangerous as a way to create order at the larger communal level.[26] In the case of environmental pollution, councils did not have to create the danger of waste philosophically; it existed as a physical reality. Danger in various forms (including plague, flooding, and noxious odors) motivated the creation of many environmental pollution laws.

At the same time, the response to physical pollution is not universal. Societies set tolerable levels of environmental contamination based on cultural ideas of cleanliness and knowledge of disease transmission. In Erik Cohen's anthropological study of a slum in Bangkok, he found a cultural tolerance for environmental contamination that would baffle most Westerners. The residents of the slum displayed a general tolerance for a strong environmental stench (characterized as "a permanent, stifling smell" by Cohen) from stagnant swampy water used as a dump for household refuse under the houses. At the same time, however, the residents showed a heightened sensitivity to body odor. Personal cleanliness was held in such high regard that most people bathed at least once a day and more often in the summer, frequently changing their clothes several times a day

[26] Douglas, *Purity and Danger*, 39–40.

to avoid any trace of body odor.[27] This example makes us aware of the power of cultural constructions in defining acceptable and unacceptable pollution.

In historical analyses of modern sanitation efforts, changes in ideas about cleanliness have been linked mainly to changing science and public health movements. For example, scientific investigations dominate Alain Corbin's analysis of changing conceptions of smell and disease in seventeenth century France and Martin Melosi periodizes American sanitation history by the prevailing scientific disease transmission theory.[28] The story of London's nineteenth century sanitary makeover focuses on public health goals inspired by disease-ridden sections of town.[29] These studies show that nineteenth and twentieth century reformers characterized waste disposal behaviors as good or bad depending on scientific notions of public health. In the medieval era, there was also concern for public health, although it was not defined in the same way as later germ theory would and health was not the only reason to regulate waste.

In order to understand the construction of pollution in the late medieval city in England and Scandinavia, we must look at the texts describing acceptable and unacceptable behavior. As McIntosh points out, because wrongdoing was not required to be reported "a report about misbehavior therefore presupposes genuine concern among community leaders, providing a glimpse into how misbehavior was constructed."[30]

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[27] Erik Cohen, "The Broken Cycle: Smell in a Bangkok Lane," in Drobnick, *Smell Culture Reader*, 118–27.
[28] Corbin, *Foul and the Fragrant*; and Melosi, *Sanitary City*. See also Melosi, *Garbage in the Cities* for discussion of the aesthetic issues tied to the public health movement in the early twentieth century.
[29] See for example Porter, *Thames Embankment* and Hamlin, *Public Health and Social Justice in the Age of Chadwick*. Hamlin's treatment of the subject also encompasses social justice issues.
[30] McIntosh, *Controlling Misbehavior*, 10.

Reports of sanitation violation tell us what was outside of socially-acceptable behavior. As Lynn Thorndike has argued about medieval sanitation:

> If a society lived contentedly with the streets in a state of 100 per cent filth, this condition, however shocking and deplorable it may seem to us, would evoke no remark or comment from contemporaries, and no records to prove the past existence of such a condition would come down to us. Most of the complaints that have come down to us from the past as to filthy and evil-smelling streets will be found to be applicable to abuses rather than to normal usage, and to testify to the existence in public opinion of higher standards in such matters than the presence of the abuse itself would suggest. Legislation is also notoriously deceptive in such matters. Is a law, and more especially repeated legislation, against nuisances and the like more indicative of their prevalence, or of public activity and sentiment against them?[31]

The councils' texts then give insights into the wider cultural construction of clean and unclean in the medieval city.

At first glance, we might think that population pressures were to blame for the late medieval sentiments against waste. Coventry, Norwich, and York after all were in the upper echelon of English urban centers. In the later fourteenth century, York ranked second in size behind only London. The population captured in the poll tax returns of 1377 was approximately 11,000, although population thereafter begins a gradual

[31] Thorndike, "Sanitation, Baths, and Street-Cleaning," 199.

decline.[32] Norwich boasted a taxpaying population and taxable wealth second only to London in 1524–25, although the town population had shrunk considerably from its pre-Black Death population of perhaps 25,000.[33] Coventry's population appears to have climaxed near 10,000 in 1434. In total population, it may have ranked as high as fourth in size behind only London, York, and Bristol in its heyday of the late fourteenth through mid-fifteenth centuries. Yet by the later 1400s, Coventry's population was declining and may have bottomed out around 7,000 or 8,000.[34] These cities had experienced significant growth from the twelfth century as reflected in new housing development both within and without the walls.[35] But by the fifteenth century, these cities experienced flat or declining populations.

In fact many leading English provincial centers, including Coventry, York, and Norwich, faced difficulties in the fifteenth and sixteenth centuries. According to Charles Phythian-Adams, they were in decline because of a "conjunction of unparalleled underlying economic and demographic vulnerability with other severe short-term pressures" including trade slumps, bad harvests, price inflation, the Dissolution of the Monasteries, and epidemics. The percentage of people who were classified as poor was growing and the total population was shrinking. By around 1570, the cities witnessed some recovery based on advances in agriculture, overcoming of earlier market

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[32] Tillott, *City of York*, 84.
[33] Alan Dyer, "Ranking Lists of English Medieval Towns," in *The Cambridge Urban History of Britain*, vol. 1, *600–1540*, ed. D. M. Palliser (Cambridge: Cambridge University Press, 2000), Appendix 6 and 7. Norwich had moved up from the number 6 spot in 1334 (Appendix 4). Pre-plague population figure from Elizabeth Rutledge, "Economic Life," in Rawcliffe and Wilson, *Medieval Norwich*, 158.
[34] Charles Phythian-Adams, *Desolation of a City: Coventry and the Urban Crisis of the Late Middle Ages* (Cambridge: Cambridge University Press, 1979), 12–21 and 298 (Table 33).
[35] Tillott, *City of York*, 52.

weaknesses, and industrial growth.[36] There has been some scholarly debate about the extent of the crisis in the early sixteenth century, but we can certainly say that it was not a generally prosperous period.[37] Because the time period witnessed a relatively stable or decreasing urban population, the changes in sanitary demands cannot be directly attributed to rising numbers within the city walls. Cultural norms of acceptable living conditions and economic considerations must have been more significant factors.

The Scandinavian cities were smaller than their English counterparts. As of 1500, Bergen was the largest Scandinavian urban settlement with probably 7,000 inhabitants and Stockholm had 5,000 to 6,000 residents. These urban areas had also experienced population declines because of repeated plagues in the mid-1300s, but it appears some had recovered by 1500 and so population pressure may have been more of a concern here.[38]

Overall, it would not appear that population pressure itself played a significant role in creating concerns about urban pollution, rather a reading of the city council records show us that their motivations related directly to three things: obstructions, civic

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[36] Charles Phythian-Adams,"Urban Crisis or Urban Change?" in *The Traditional Community under Stress*, ed. Charles Phythian-Adams (Walton Hall, UK: Open University Press, 1977), 11–23. Phythian-Adams discusses the Coventry case in detail in *Desolation of a City*. Interestingly, Coventry's sanitation actions do not directly correlate to either the particularly stressful times (such as the 1439 subsistence crisis or 1479 plague) or improving periods (such as the 1490s) identified by Phythian-Adams.

[37] See for example Peter Clark and Paul Slack, *English Towns in Transition 1500–1700* (Oxford: Oxford University Press, 1976) and *Crisis and Order in English Towns 1500–1700* (London: Routledge & Kegan Paul, 1972); Paul Slack, "Brief Comment," in Phythian-Adams, *Traditional Community Under Stress*, 24–28; and Penelope Corfield, "Urban Development in England and Wales in the Sixteenth and Seventeenth Centuries," in *The Tudor and Stuart Town: A Reader in English Urban History 1530–1688*, ed. Jonathan Barry, 35–62 (London: Longman Group, 1990).

[38] Dahlbäck, "The towns," 615–16.

pride, and smell / disease. Each of the sections below analyzes one of the reasons posed in the city council texts for why a certain waste practice was deemed unacceptable.[39]

## Obstructions

Waste dumped in the wrong places obstructed routes of commerce, both roads and rivers. In this way, waste became a problem only when it was "out of place." Some of the earliest citations for illicit waste disposal are related to obstruction caused by the waste heap. In Norwich, the Leet court of the thirteenth and fourteenth centuries often fined obstructers: for example, Robert was fined for placing a muckheap in the street gutter in such a way that carts could not pass by, Roger de Morley obstructed the king's highway with his muckheap, and William Gerard was cited for leaving a dead horse in the roadway.[40]

The urban waterways directly influenced how the city elites attempted to deal with waste, because blockage of waterways obstructed commerce and could lead to flooding. Urban rivers or the sea both placed constraints and provided opportunities for the citizens of medieval cities. Because of the necessity of water for commerce, travel and consumption, medieval cities of any size had to be situated on water. The English

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[39] Within the scope of this dissertation, I have not compared the city council texts to literary sources discussing cleanliness. Douglas Biow has written such a study for Italy 1350–1600 and his findings prove that Italians during the Renaissance were quite preoccupied with notions of cleanliness: Douglas Biow, *The Culture of Cleanliness in Renaissance Italy* (Ithaca: Cornell University Press, 2006). I have, rather, focused on the physical and environmental context of the council orders, which I believe still gives an accurate picture of the cultural ideas about waste. In this limited way, I put sanitation and sanitary crimes into a larger cultural context per the call of Barbara Hanawalt, "'Good Governance' in the Medieval and Early Modern Context," *Journal of British Studies* 37.3 (July 1998), 247–48.

[40] *Leet Jurisdiction in the City of Norwich*, 11, 3, 75.

cities in this study had rivers running through town whereas the Scandinavian cities were on bays.

These waterways were vital to the urban economies. For instance, Stockholm was a major trading center for the Hanseatic League, exporting copper, iron, furs, and fish in exchange for grains via Stockholm's harbors.[41] As another example, active large-scale merchant activities in York created European markets for York-produced cloth as well as bringing raw materials. The merchant class dominated the medieval urban economy, not because of their numbers which were less than 15% of the freemen, but because of the economic stimulus of their activities. Merchants were the wealthiest citizens of the medieval city; wills attest to merchants having goods valued at over £1000 compared to average craftsman who might have a value of £5.[42] Because of their financial status, merchants typically dominated the upper echelons of city government.[43] Their economic success often depended directly on easy transport via water.

In York, the River Ouse passed through the heart of the city and the River Foss wound its way through the eastern side (see Figure 2-1). The Ouse was the main commercial maritime channel, whereas the Foss created swampy conditions and several large pools. Because of the economic importance of the Ouse River, the council hired a Master Mathew Hirst in 1552 to supervise cleansing the Ouse "for easy passage of

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[41] Dahlbäck, *I medeltidens Stockholm*, 70–71.
[42] For a fuller discussion of mercantile activities in York see Tillot, *City of York*, 97–106. For a tabulation of will values for York, see Heather Swanson, *Medieval Artisans: An Urban Class in Late Medieval England* (Oxford: Basil Blackwell, 1989), Table 11.2.
[43] The commonalty was not completely overshadowed and craftsmen tended to gain power in city government from the mid-fifteenth century onward. See discussion in Swanson, *Medieval Artisans*, 120–26.

shippes to and fro this Citie." They even instructed Hirst to begin at the wharf "where most nede is."[44] Waste piles disrupted commerce, the life-blood of the city.

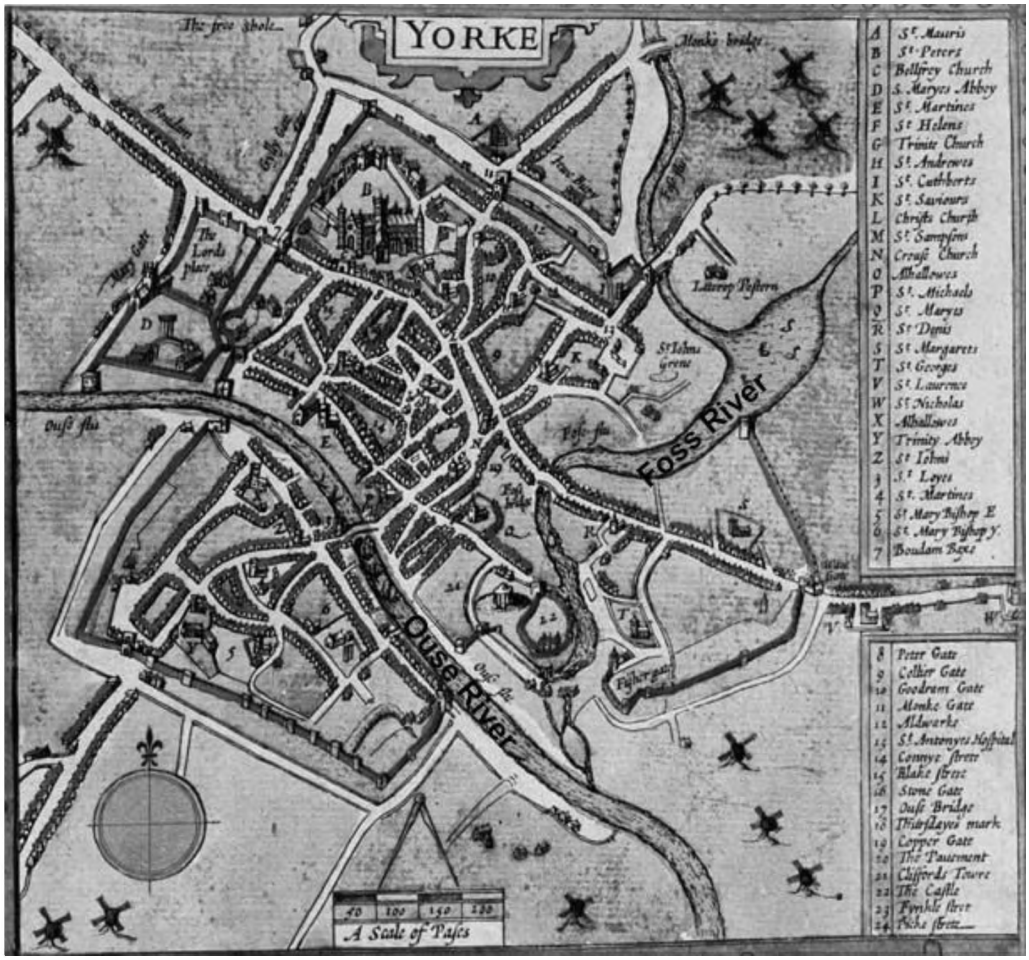


Figure 2-1. York's town plan showing the Rivers Ouse and Foss. From John Speed, *The Theatre of the Empire of Great Britaine*, Map of Yorke, 1611.

Norwich's River Wensum took a winding course through town and, based on the frequency of complaint about weed overgrowth stopping up the river, was relatively shallow (see Figure 2-2). In 1390, the Norwich court found John de Shouldham guilty of

[44] *York Civic Records,* vol. 5, 162.

obstructing and straightening the river by throwing muck and other garbage from house repairs into it. His actions had so obstructed the river that boats were unable to pass by.[45] Norwich's river played a vital role in the economy of the city, a large and important import and export center. Thus, the council was highly concerned when muckheaps and filth, along with weeds and soil accumulation, obstructed the river. In 1452, the council identified the immediacy of the situation: "unless quick remedy be applied, very great dangers and losses, likely to occur both to us and to the same city and parts adjacent, are feared."[46] It appears that the accumulated waste, weeds, and dirt silted up the river to such an extent that dry ground formed in the middle of the river, making the flow negligible at times.[47]


Figure 2-2. Norwich's town plan showing the River Wensum. From John Speed, *The Theatre of the Empire of Great Britaine*, Map of Norwich, 1611.

[45] *Leet Jurisdiction in the City of Norwich*, 73.
[46] *Records of the City of Norwich,* vol. 2, 318–19.
[47] *Records of the City of Norwich,* vol. 2, 96–97.

The Scandinavian cities were significant ports. Stockholm was mainly confined to an island with several harbors (see Figure 2-3) and Bergen sat at the end of the Vågen bay. The harbors served critical trade functions as well as being waste disposal sites. On several occasions, the Stockholm council had to remind residents that it was illegal to throw ship ballast, mats, and other waste into the harbor.[48]

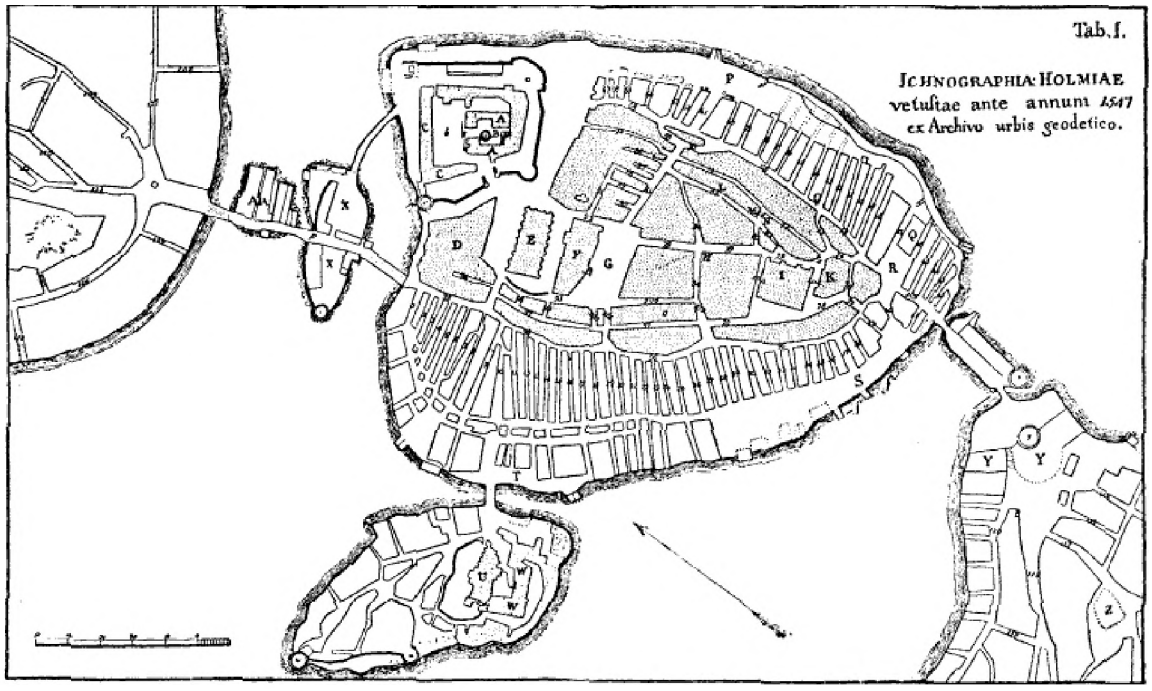


Figure 2-3. Stockholm's town plan as of 1547. From *Nordisk familjebok*, ed. Th. Westrin, vol. 26, *1496–97* (Stockholm: Nordisk familjeboks, 1917), http://runeberg.org/nfcf/0818.html.

Coventry was an exception to economic-dependence on water transport. The River Sherbourne, a non-navigable river meandering through the medieval city, was primarily a drainage way (see Figure 2-4). Coventry lies within a shallow basin at a bend in the river, creating many low-lying areas and marshes. Medieval deeds include frequent

[48] *Stockholms Stads Tänkeböcker 1474–1483*, 430, 465, 489; *Stockholms Stads Tänkeböcker 1483–1492*, 166, 340.

references to land called *mora*, indicating that marshy land was a common feature.[49] The river's drainage function made it play a critical role in waste disposal dilemmas. One frequent concern was the blockage of the Sherbourne by accumulated waste. The river provided rainwater drainage in spite of its shallow course, so any reduction in the river's carrying capacity could have serious consequences for city residents, including large-scale flooding. The 1421 Coventry mayor's proclamation lamented that the river had been "stoppyd of his course" by "filthe, dong, and stonys" causing "dyuers perels…by floodys." [50] In the opinion of the city leaders, the urban waterway was a "comen Ryver,"[51] although in contrast to the other cities, the river's value was for drainage rather than commerce. Because of the Sherbourne's status as a common good, the Coventry council acted to preserve the integrity of the river and avoid flood damage in the urban area.

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[49] W. B. Stephens, ed., *A History of the County of Warwick, vol 8: The City of Coventry and Borough of Warwick* (London: Victoria County History, 1969), http://www.british-history.ac.uk/source.asp?pubid=49, 1.

[50] *Coventry Leet Book*, pt. 1, 29–30. Other things including the dyers' waterlades (pt. 1, 31–32) and stakes placed in the river (pt. 1, 119) were also prohibited because of the fear of flooding due to decreased water carrying capacity of the river. Weirs and encroachments along with wastes are blamed for stopping the course of the Sherbourne in 1469 (pt. 2, 347–48).

[51] *Coventry Leet Book*, pt. 1, 91. The river is referenced as the common river many times: "comune Ryver" (pt. 1, 29) in 1421, "comen Ryver" (pt. 1, 91) in 1424, "the rever of this Cite" (pt. 2, 347) and "the comyn rever" (pt. 2, 349) in 1469, and "comien Ryver" (pt. 2, 388) in 1473.

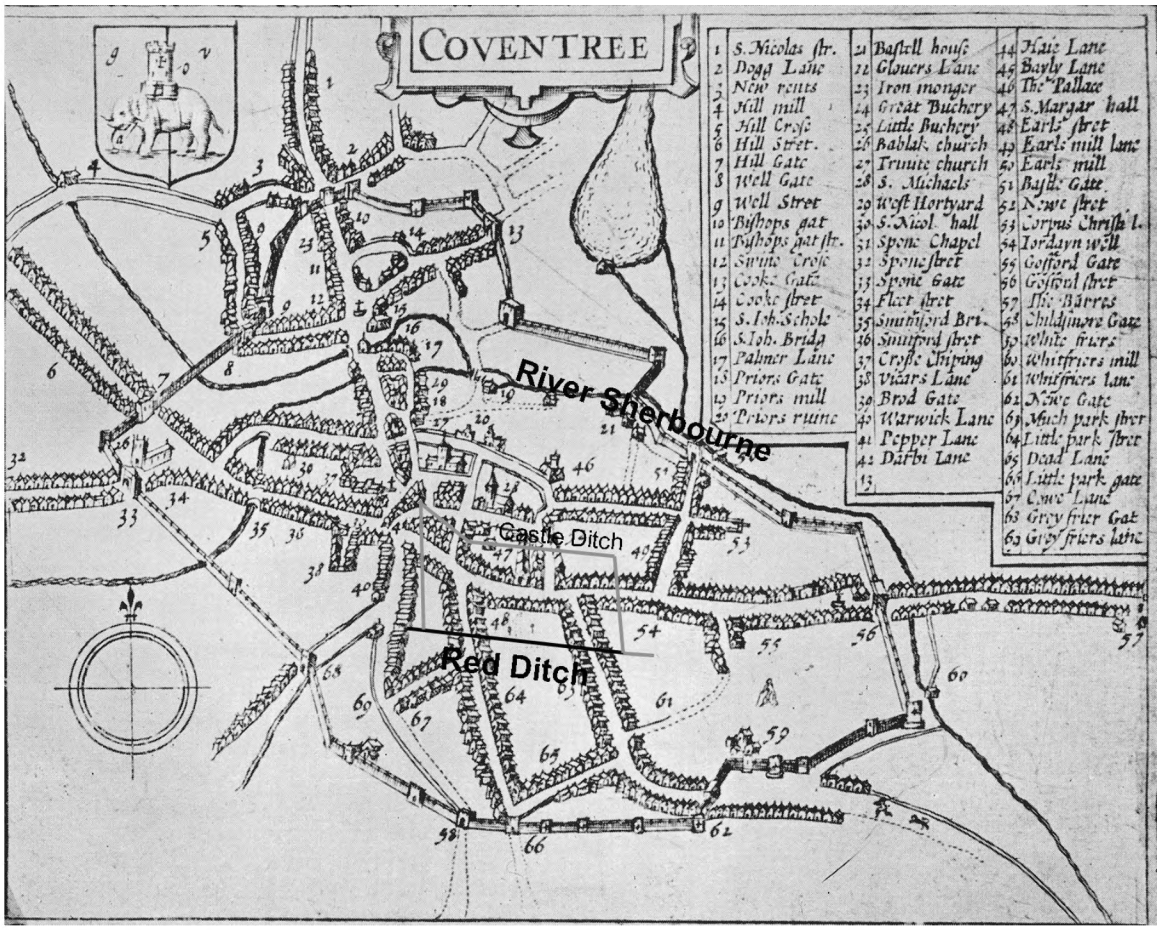


Figure 2-4. Coventry's town plan showing the River Sherbourne and Red Ditch. Ditch locations based on Keith Lilley, "Mapping the Medieval City: Plan Analysis and Urban History," *Urban History* 27.1 (2000), Figure 6. The base map is John Speed, *The Theatre of the Empire of Great Britaine*, Map of Coventree, 1611.

These examples reveal the immediate economic consequences of improper waste disposal. City councils expressed genuine concern over street and river blockage and its effect on commerce, as well as the security of homes threatened by flooding. It is not surprising, therefore, that activities which obstructed streets and waterways would be subject to regulation.

## Civic pride

Although not as tangible as obstructions to commerce, civic pride factored into city council reasoning for sanitation provision. In Michael Kucher's analysis of the water supply of Siena, Italy, "the beauty of the city" appeared as a primary concern for the removal of latrines in 1309–10.[52] Clean streets became a civic virtue because cities with filthy streets could never be "beautiful" according to Leonardo Bruni, thus cleanliness was often by writers to compare the virtues of the Italian city-states.[53] A similar interest in cleanliness for its beautifying power comes from Norwich in 1559. The council passed a paving statute and remarked that paving had not only been "a great ease and helthefull commodyte to the inhabitauntes" but also "goodly bewtefying" and visitors from "ffarre and strange places haue moche comended and praysed the same and the Maiestrates in the foresight for the mayntenaunce thereof." The council lamented that many residents were not upholding their pavement because "great gredynes and obstinacy" had caused them to "neyther regarde the comodyte of helth, ther owne eses and ther naybors, nor yet the bewtefying of the cittie."[54] In this statement, we see that the Norwich council valued the city pavement as an instrument of city beautification and part of its reputation.

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[52] Michael Kucher, "The Medieval Roots of the Modern Networked City: The Water Supply System of Siena, Italy" (PhD dissertation, University of Delaware, 2000), 146.
[53] Michael Kucher, "The Use of Water and its Regulation in Medieval Siena," *Journal of Urban History* 31.4 (May 2005), 510.
[54] *Records of the City of Norwich,* vol. 2, 133.

Visitors to the city had specifically commended the council for maintaining the city streets, thus the council believed paved streets bolstered the city's image.[55]

Maintaining clean and paved streets was considered part of proper moral behavior. In 1517, the Coventry council commissioned the ward aldermen to execute the traditional ordinances of the city. The list included street cleaning regulations, pavement requirements, limitations on swine sties, river cleansing mandates and prohibitions against sewage draining into the ditches. This was in addition to the aldermen's duties to punish vagabonds, illegal alehouse mistresses, and those who participated in illegal sports. The aldermen were instructed to "execute all oder good ordynaunces made for the welth of the Citee within ther warde."[56] Sanitation was thus part of a larger program of civic order and pride.

The councils harbored the notion that polluting activities ran contrary to the "public good." People who threw muck and filth into city gutters were "yll-disposed persons" acting "contrarie to all good rule of the Citee."[57] The Stockholm council used the term "godemen" to define those who kept the city clean with "much duty and obedience."[58] By defining polluters in these kinds of moral terms, the councils appear to have believed that improper waste disposal transgressed the standards of moral order. The councils took it as their duty to enforce moral behavior in the city and had the power

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[55] In this belief, the medieval citizens were not very different from the City Beautiful reformers inspired by the White City of the 1893 Chicago Columbian Exposition. For a description of their activities and concept of beauty, see Melosi, *Garbage in the Cities*, 91–94.
[56] *Coventry Leet Book*, pt. 3, 652–53.
[57] *Coventry Leet Book*, pt. 3, 631–32.
[58] *Stockholm Tänkeböcker 1514–1520*, 288.

to do so. Filth was rejected from the urban space as a disorderly thing similar to vagabonds, prostitutes, and illegal game players.

## Smell and disease

Filth may have conjured up associations to moral degenerates because of its proclivity for smelliness.[59] Although smell is a biological function common to all humans, reactions to particular smells are culturally learned behaviors. Research on the development of odor preferences in infants and children shows that the meanings of smells are associated to the physical, social, emotional, or semantic context of the odor. Odor preferences, then, are not hard-wired, but rather formed through stimuli.[60] Jim Drobnick has observed that

> Often delimited as a mere 'biological' sense, scents are, on the contrary, subtly involved in just about every aspect of culture, from the construction of personal identity and the defining of social status to the confirming of group affiliation and the transmission of tradition… The manners and reasons people engage with the sense of smell are influenced by numerous cultural factors relating to the constructs a society creates integrating the environment, the bodies of its citizens and its symbolic worldview.[61]

The cultural meaning of smell was first thoroughly explored by Alain Corbin in *The Foul and the Fragrant*. In this work, Corbin traces what he calls a "hypersensitivity to odors"

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[59] C. M. Woolgar discusses the medieval linkage between bad smells (human excrement, lepers, standing water) and evil in *The Senses in Late Medieval England* (New Haven: Yale University Press, 2006), 121-132.
[60] Rachel S. Herz, "I Know What I Like: Understanding Odor Preferences," in Drobnick, *Smell Culture Reader*, 190–203.
[61] Jim Drobnick, "Introduction: Olfactocentrism," in Drobnick, *Smell Culture Reader*, 1.

in eighteenth century France. He argues that an emphasis on phenomena of the air, specifically odors, within chemistry and medicine at the time can be linked to growing elite interest in public sanitation and deodorization. Although this dissertation will show that people in the later Middle Ages were just as interested in sanitation as those in Corbin's period, Corbin makes a powerful observation that "abhorrence of smell produces its own form of social power. Foul-smelling rubbish appears to threaten social order, whereas the reassuring victory of the hygienic and fragrant promises to buttress its stability."[62] The linkage between smell and social order, and thus social power, must inform the reading of actions of the city councils.

Most researchers agree that universally pleasant or unpleasant smells do not exist, although some have made an exception for feces odor, which most human adults dislike.[63] Drobnick employs the term "odorphobia" to denote a cultural intolerance for smells, specifically as it is directed toward places or people. It is often linked to state or majority agendas and serves as the boundary marker between self and other.[64] This claim is very similar to Corbin's notion of social power. Thus the regulation of odoriferous waste in the Middle Ages is related to a cultural intolerance for those particular smells.

The medieval intolerance to smelly waste was heavily influenced by the miasmic theory, the prevailing disease transmission theory of the times. The miasmic theory attributed disease to the corruption of air, which could be visible (like a fog) or invisible. While it is true that medicinal tracts from the Middle Ages, particularly those written

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[62] Corbin, *Foul and Fragrant*, 5.
[63] J. Douglas Porteous, "Smellscape," in Drobnick, *Smell Culture Reader*, 90–91.
[64] Jim Drobnick, preface to "Part I: Odorphobia" in Drobnick, *Smell Culture Reader*, 14.

about plague prevention in southern Europe, highlight the role of miasmas, none of the tracts directly link waste and the smell of waste to the disease. One exception might be the foul smell of dead bodies, which was the subject of pestilence regulation: Pistoia's "Ordinances For Sanitation In A Time Of Mortality" from 1348 required particularly deep graves for plague victim corpses to "avoid the foul stench which the bodies of the dead give off." [65] The Pistoia ordinances also forbade butchers from having a shop near any kind of tavern, shop, stable, or pen that "give off a putrid smell," although there is not any direct mention of wastes from these locations. Pestilence tracts also mention the disease-preventative qualities of certain strong smells, typically spices. The source of the air corruption is often a mystery to the writers, although in some tracts there was an understanding that disease was transmitted in some fashion through other people.[66]

Regardless of the direct linkage of waste and miasma, there was a general consensus that some wastes, because of their strong odor, affected air quality. The smell of dung and rotting flesh "corrupted" the air according to several entries in the Norwich leet court records before 1400. In a case brought before the Norwich leet court 1288, a man named Roger Benjamin paid a two shilling fine for setting up a muck-heap in which he buried offal causing the air to be "abominably corrupted" (Latin: *aer pessime*

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[65] Text translated by Duane Osheim and available online http://www3.iath.virginia.edu/osheim/pistoia.html. The Pistoia ordinances also forbid butchers from having a shop near any kind of tavern, shop, stable, or pen that "will give off a putrid smell." There is not any direct mention of wastes from these locations.

[66] For example, see Marchione di Coppo Stefani's *The Florentine Chronicle*, Rubric 643 where he writes that "Some fled to villas, others to villages in order to get a change of air. Where there had been no [pestilence], there they carried it; if it was already there, they caused it to increase." Text translated by Duane Osheim and available online http://www3.iath.virginia.edu/osheim/marchione.html.

*corrumpitur*).[67] A similar wording was used in another case that same year when William the skinner was fined for throwing dead cat bodies into a pit whereby "aer corrumpitur."[68] When William Gerard left a dead horse lying for a long time in the street, it also caused "abominable offence and corruption" (*magnam abhominacionem et corrupcionem*) of the air.[69] The use of the word "corrumpitur," corruption or poisoning, indicates that the waste certainly smelled and was probably thought to make the air unhealthy.

Smell, unlike physical waste, is uncontained. It drifts from the location of the waste to affect even passers-by. Smell may have been the primary complaint about a piece of property in Norwich which was "soore accombred and replenysshed by divers persons with muk and such other vile mater to the grette noysaunce of all the Kynges liege people passing by the same."[70] The odor obviously drifted from the property to the street. A similar case occurred in 1421 when the York council ordered the citizen John Preston to keep his property free from entrails and other filth causing foul smells.[71] Smelly waste was thus considered a nuisance because it caused discomfort to those passing by and possibly would make them sick.

Several records show a connection between waste disposal and the creation of harmful odors. The Prior of Coventry appears to have made a connection in a document

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[67] *Leet Jurisdiction in the City of Norwich*, 23.
[68] *Leet Jurisdiction in the City of Norwich*, 29.
[69] *Leet Jurisdiction in the City of Norwich*, 75.
[70] *Records of the City of Norwich,* vol. 2, 122–23.
[71] *York Memorandum Book (B/Y)*, 58. The London council also ordered its butchers to relocate their activities because waste dumped in the river caused neighbors harm "by the corruption and grievous stench and by the loathsome sight," *Calendar of the Close Rolls preserved in the Public Record Office, Edward III, vol. 13, AD 1369–1374* (London: Public Record Office, 1911), 31–32.

he sent to the city council in 1480. He complained that the city dwellers daily threw their dung, filth, and sweepings into the river such that a stench, or an "evell eyre" as he called it, made "he, his Brethern & all other ffolkes there be hurte." [72] There is a similar instance in the Stockholm city records for 1563 in which the council discussed the "difficult and evil stench" ("swåre och onde stanck") coming from pigs living in the city which caused "summer sicknesses."[73] Both cases clearly link the smell of waste to sickness.

Waste disposal practices appear to have been directly associated in a few cases with disease, although in these cases the smell of the waste was not specifically discussed.[74] In 1544, the inhabitants of Coventry's Crosscheaping district commonly deposited dung and other waste at the cross in the market. The council forbade the continuation of this practice because the waste was a "great incommoditie of the marketh-place" and caused "great daunger of infection of the plague."[75] Interestingly, however, the Coventry order made no direct mention of the smell of the waste or corruption of the air, yet the council considered waste disposed in the open at the market cross to be infectious. The York council may also have had a link between waste and disease in mind in June 1564 when they ordered the ward constables to keep the streets

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[72] *Coventry Leet Book,* pt. 2, 445.
[73] *Stockholm Stads Tänkeböcker 1553–1567*, 224.
[74] Carlo Cipolla's study of the Florentine health officers established by an ordinance of 1622 shows without a doubt that the linkage between waste, smell, and disease was clearly in force in Italy by the seventeenth century. Doctors who investigated disease outbreaks made this connection frequently in their reports. The ordinance itself says, "Since experience has often shown that contagions and sicknesses are caused mainly by the fact that in their houses … men are surrounded by dirt and by such quantities of filth…; since this rubbish tends to give off smells and stetches which are so damaging to health…everyone should remove and have removed from before their houses all the filth and rubbish which are to be found there, including manure and other things which can and do cause smells and stench." Carlo Cipolla, *Miasmas and Disease: Public Health and the Environment in the Pre-Industrial Age*, trans. Elizabeth Potter (New Haven: Yale University Press, 1992), Appendix.
[75] *Coventry Leet Book*, pt. 3, 775.

and gutters clean immediately after they had discussed the creation of a gate watch to keep out strangers due to the current "sykenesse" in the city.[76]

The same lack of explicit connection between waste and smell appears in a complaint before the Norwich council in 1579 about foreigners who kept untidy "necessaries" and dumped their wash water into the gutter, which bred "greate infeccion" in the river and street gutters: "that at this assemblye was greate complayntes made agaynste the straungers for the corrupte kepinge of their howses and necessaries, and also for the great anoyance of the river by skowring their bayes and wasshinge them all alongeste the ryver to the greate infeccion of the same." Their actions poisoned the water and bred "corrupte humours" within their bodies. Although the complaint acknowledged corruption of the water by the waste, it did not include a link to miasmas or smells. The council ordered the foreign residents to keep their latrines dry; cleanse their houses, clothes, and bodies; and use perfumes and preservatives prescribed by physicians to ward of pestilences. This was directly connected with a recent outbreak of "the plauge" in two parishes of the city.[77] Smell appears as a preventative action for disease (the use of

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[76] York Civic Records, vol. 6, 83–84.

[77] *Records of the City of Norwich,* vol. 2, 335–37. The linking of the waste with an outbreak of plague is similar to what Ernst Sabine observed in his inquiry into control of butchery in London. Sabine ties the complaints against butchers to outbreaks of plague in the city. It appears that citizens and church authorities both made connections between disease outbreaks and filthy, smelly activities such as these. Sabine concludes that each modification of the butchers' practices was a direct result of desires to improve public health. In Sabine's assessment, although the final arrangement in which butchers took their waste cut up into small pieces in boats out to the middle of the Thames at ebb tide for disposal was not ideal, it minimized the impact and nuisance of the butchers. See Sabine, "Butchers in Mediaeval London." According to Paul Slack's analysis of responses to plague in the sixteenth and seventeenth centuries, foreigners, vagabonds, and the poor were often identified as plauge carriers and cities sometimes implemented strict quarantine measures to control the movement of these types of people. Norwich's targeting of foreigners as breeders of plague agrees with this finding. However, Slack does not discuss waste control as a common plague response, so the linkage between disease and waste disposal practices

perfumes and other strong-smelling herbs) but the disease itself is linked to infected water, not bad air.

All of the complaints deal with biological waste – manure, human feces, and animal corpses – which give off strong odors as they decompose. Corbin noted that in the eighteenth century, some French scientists suggested that there was a need to distinguish between feces odor and threat of putrescence, or "excremental stagnation."[78] The reactions to waste and smell in the council actions appear to align with this idea. The councils were most concerned about waste when it was left in place where its smell during decomposition would affect members of the public – muckhills in the street, accumulated waste in the river, waste piles at the market cross.

Perhaps we should read concerns about smells as part of a power struggle. Because smells are not physically bounded, one individual's bad practices had a wider public effect. Although an individual had the need to dispose of waste, the councils had the obligation to protect the public from the noxious smells and potential disease. Thus they exercised their political power to enforce their sanitary vision.

This should not be taken to mean that only the highest elites had a "refined" sense of smell. After the mid-fifteenth century, some of the city council sanitation acts were passed or requested by the commonalty, the larger body of citizens (typically 48) who represented the community in a wider sense than the mayor and 12 aldermen. In the same period, craftsmen increasingly took on city government roles, making the councils much

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does not appear to have been made frequently. See Paul Slack, *The Impact of Plague in Tudor and Stuart England* (Oxford: Clarendon Press, 1985).

[78] Corbin, *Foul and Fragrant*, 28.

more representative of the citizenry.[79] It was not that elites had a different sense of smell; it was rather that civic authorities had the power to enforce a communal sense of smell on renegade urban inhabitants. Medieval civic governments were generally conservative, attempting to maintain the status quo.[80] They were not attempting to create utopias, but to maintain culturally-accepted standards of the time. As Douglas argues,

> Culture, in the sense of the public, standardised values of a community, mediates the experience of individuals. It provides in advance some basic categories, a positive pattern in which ideas and values are tidily ordered. And above all, it has authority, since each is induced to assent because of the assent of others. But its public character makes its categories more rigid. A private person may revise his pattern of assumptions or not. It is a private matter. But cultural categories are public matters. They cannot so easily be subject to revision.[81]

Waste became the subject of medieval urban regulations because its smell transgressed wider accepted cultural standards. The councils, as the city government and mediators of conflict, served as enforcers of cultural norms.

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[79] The commonalty of York wrote new city ordinances in 1484 that included the requirement to clean the streets weekly and made the alderman responsible for the cleanliness on penalty of losing their office (*York House Books*, vol. 1, 353–54). Craftsmen moved into government in the later fifteenth century, although some crafts like tanners never broke into government in spite of high income. The merchants still tended to be the mayors, but aldermen increasing came from the craft class. For Norwich, see Ruth H. Frost, "Urban Elite," 239–40; for York, see Swanson, *Medieval Artisans*.

[80] Frost, "Urban Elite," 245.

[81] Douglas, *Purity and Danger*, 39.

## *An Intersection of Concerns*

In the regulations, human and animal waste is characterized as filth, muck, and uncleanliness. This terminology reveals the extent to which these wastes were seen as an environmental problem in the Middle Ages. Waste improperly handled became filth, and filth required removal because it transgressed social norms. When waste is called filth in the medieval documents, it reinforces the rejection of the material as that which is unclean, both physically and morally. Filth interfered with commerce, civic ideals, and harmed the public through odors and disease. Waste violated the cultural construction of acceptable smells and moral behaviors. The civic authorities thus defined the improper disposal of filth as misbehavior. The councils therefore exercised their power to regulate the urban environment and enforce larger communal standards for the betterment of the public.

The concerns had a direct bearing on the urban environment. As the following chapters will demonstrate, the city councils went to great lengths to clean up waste from the urban spaces because filth caused obstructions, tarnished the city image, and created a smelly, unhealthful nuisance. The city authorities managed and regulated the urban filth in different ways, including restricting waste disposal options, providing city-run services to pick up waste and scour rivers, and requiring householders to clean the streets as the subsequent chapters will show. The environmental concerns of urban living thus had a direct effect on the form and scope of city government.

# 3

# Making Private Matters Public[1]

"If the dog is tied to the chamber then he should not attack people that go to the chamber to sit on wood." So says the *Grágás*, the Icelandic law code from the 1100s.[2] While "sitting on wood," as using a latrine was called, people have always wanted to be left alone. But medieval government officials knew that people could not be left alone when making decisions about latrines because their decisions affected other city dwellers and the overall cleanliness of the city. Houses of waste could be troublesome to city residents and authorities alike.

Medieval sanitation laws included regulation of seemingly personal concerns, including latrines. Latrines and cesspits commonly served as both final disposal and temporary storage locations for personal waste material. When people lived in non-urban areas, they managed these facilities themselves and because of the local nature of the waste disposal, others were not affected by individual disposal practices. In the medieval city, however, this private waste was a public matter. How did private excrement become a public concern? This chapter will explore how medieval communities actively regulated the disposal of human waste within their jurisdictions by managing latrine placement and waste disposal. In order to effectively control the popular practices, city

[1] An earlier version of parts of this chapter was presented at the International Congress on Medieval Studies, Kalamazoo, 2006. Thanks to Richard Hoffmann of York University for organizing the session "The Stench of the Middle Ages" in which it appeared. A written version of that paper was published as Dolly Jørgensen, "Medieval Latrines and the Law," *Medium Aevum Quotidianum* 53 (2006), 5–16.
[2] Translated from Økland and Høiaas, *Bare boss*, 5.

councils implemented new legislation and governmental structures including the raising of taxes to provide community-wide services and addition of new personnel to handle the new responsibilities. This finding helps to explain one of the reasons that the late medieval period witnessed the growing power of town oligarchies, which is a common theme in the historiography of the period.[3] Environmental pressures and conflicts between private and public uses of sanitary systems helped stimulate the growth of medieval government, and at the same time, growing medieval governments had more authority to claim public jurisdiction over private matters. Although the creation of human waste itself may have been a private matter, latrines in the later fourteenth through mid-sixteenth centuries were very much within the public sphere. Public regulation of latrine placement and organic waste disposal controlled individual behavior for the larger public good. Making this private matter into a public concern was integral to good city government in the eyes of elite citizens.

The regulation of latrines in northern medieval cities has been much neglected in the historical literature. For England, only the metropolis of London has received basic treatment. Ernest Sabine finds that London's public latrines served both transient businessmen as well as residents without access to private latrines. City officials expected residents to use the public facilities rather than throwing excrement and urine in the streets, as is evident in complaints brought against those who behaved otherwise. The bridge masters financed repairs to the public latrines on London Bridge on several

[3] For example, John A.F. Thomason, ed. *Towns and Townspeople in the Fifteenth Century* (Gloucester, UK: Alan Sutton, 1988); Lorraine Attreed, *King's Towns*; and Gerald Harriss, "Political Society and the Growth of Government in Late Medieval England," *Past and Present* 138 (Feb 1993): 28–57.

occasions. Sabine also observes that both public and private latrines were often situated over running water to take away waste and that the city government tried to curb construction of such latrines because of watercourse blockages.[4] Although Sabine provides a detailed listing of latrine conflicts in the London records, he offers little analysis of the motivations, concerns, or technological and environmental constraints which dominated the conflicts. He also offers little discussion of the programmatic nature of the London city officials' actions. This is unfortunate because latrine regulation can give modern scholars insight into material conditions of the medieval urban space, as well as the workings of practical city government.

The only extended analyses of latrines in Scandinavia come from the discipline of archeology. In an analysis of waste disposal practices in medieval Bergen, Bård Gram Økland finds that city residents constructed a wide variety of latrine types, but latrines in overhanging galleys and in stand-alone structures were most typical by the fourteenth century. He concludes that this shift is part of a larger cultural movement to redefine cleanliness in the city.[5] The details he summarize about latrines in Bergen are extremely valuable. Several other archeologists have written shorter pieces that include a discussion of latrines as well, the most complete being a collection of essays from the fourth bi-annual colloquium entitled "Lübecker Kolloquium zur Stadtarchäologie im Hanseraum."[6]

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[4] Sabine, "Latrines and Cesspools," 306–11. Sabine counted references to at least thirteen public London latrines in the fourteenth century records.

[5] Bard Gram Økland, "Det Ureine Avfallet? Ein arkeologisk analyse av avfallshandtering i Bergen 1150–1700" [The unclean waste? An archeological analysis of waste handling in Bergen 1150–1700] (Master's thesis, University of Bergen, 1998).

[6] Gläser, *Lübecker Kolloquium IV Die Infrastruktur*. Also noteworthy is Torstenson, *Fra Nattman til Renholdsverk*.

Each of these essays deals with one of the cities that joined the Hanseatic League in the late Middle Ages and summarizes the findings from numerous archeological findings relevant to urban infrastructure. Often, these essays include two or three pages on sanitation finds such as latrines and briefly discuss city and state placement regulations.

This chapter combines both legal records and physical remains to explore how medieval communities regulated the disposal of organic waste and how those decisions changed the relationship between the government and public. The first section discusses the notion of privacy in the Middle Ages and its relationship to latrines. The second section presents an overview of medieval latrine technology to make clear the technological choices involved in their construction. The following sections discuss governmental actions dealing with latrines, including controlling latrine locations, providing public latrine facilities, and overseeing organic waste disposal. In light of these regulations and services, we see how seemingly private matters were made into public concerns.

## *Latrines and Privacy*

Anthropological literature dealing with defecation in the Middle Ages has stressed the development of privacy and a sense of shame in the later medieval period. Notably, in *The Civilizing Process*, Norbert Elias identifies the mid-sixteenth century as a turning point in manners and privacy. Through examples such as Erasmus' statement of 1530 that "it is impolite to greet someone who is urinating or defecating" and Della Casa's admonition of men who "relieve nature in the presence of other people," Elias argues that

bodily functions became more secret and charged with negative emotions. He notes "a notable rise of the shame threshold," yet acknowledges a freedom of discussion of the subject of bodily functions. For Elias, those of higher social rank forced this newfound sense of privacy on those of lower rank. He argues that the restraint of bodily "instincts" is first enforced in the presence of others of higher social rank. Then as the hierarchical character of society became less rigid, bodily exposure became a more general offense.[7] Georges Duby and collaborators argued in *A History of Private Life* that privatization – the creation of personal space within the home and the movement of activities from outside to inside – should be seen as the prevailing development from the thirteenth century. Privacy and shame became associated with biological functions, thus the development of words for latrines such as privies, necessaries, and secret houses.[8] In *A History of Shit*, Dominique LaPorte notes that in 1539 the French King required Parisians to install household latrines, leading to the privatization and domestication of human waste. Each person was made responsible for handling his own excrement and keeping it away from neighbors.[9]

These authors stress the separation of bodily function from public view; the evidence certainly confirms that the late medieval period witnessed a growing sense of privacy as modern scholars would define it. Yet as this chapter demonstrates, instead of

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[7] Norbert Elias, *The Civilizing Process: The History of Manners*, trans. Edmund Jephcott (New York: Urizen Books, 1978), 129–42.
[8] Georges Duby, ed. *A History of Private Life: Revelations of the Medieval World*, trans. Arthur Goldhammer (Cambridge, MA: Harvard University Press, 1988).
[9] Dominique LaPorte, *The History of Shit*, trans. Nadia Benabid and Rodolphe el-Khoury (Cambridge, MA: MIT Press, 2000), Chapter 2.

removing waste from public discourse and purview, late medieval city regulations served to reiterate the place of waste in the public forum. Privacy may have been valued during the actual waste production process, but beforehand, when the latrine was set up, and afterward, when accumulated waste required disposal, human wastes became a public matter. Thus, we cannot simply see the later medieval period as a time of growing privacy, but also as a point of increasing management and governance of the biological.

Notions of the public sphere often extended quite far into everyday life in the late medieval city. Scholars have long recognized that late medieval city councils actively regulated many aspects of citizen life, particularly commerce. Councils issued trade legislation, generally in conjunction with the trade guilds, to protect their inhabitants and control monetary tolls. Restrictions on food preparation and sale appear often in the council records: fines on butchers who sell rotten meat, fishmongers who sell on the wrong days of the week, and bakers who operate without guild membership. In support of their economic interests, councils often concerned themselves with city infrastructure. Expenditures on bridges and city walls ensured a market-friendly and well-protected city; maintenance and regulation of public spaces such as markets and quays maximized the city's trade. Fire regulations, for obvious economic reasons, also became commonplace through the fifteenth century. The physical nature of city life demanded that cities regulate the food supply upon which residents depended but over which they had little control, maintain bridges and walls for safety, and issue fire regulations to protect city investments. The physical limitations of the city also required sanitation regulation.

Within the confined, crowded space of the city, wastes like human excrement posed a threat to order not unlike dilapidated bridges and fire hazards; therefore, latrines could not exist only within the private sphere.

## *Latrines as Technology*

Medieval latrines in England and Scandinavia came in a variety of configurations from simple waste collection pits to complex systems with drains. In technological histories, latrines are generally incorporated as early precursors to modern toilets, albeit as technological regression from the Roman civilization's sewage systems. Any more advanced medieval systems are attributed to monastic houses and described as unique to the religious orders or to the households of nobility.[10] In classic encyclopedic technological history texts such as Maurice Daumas' *A History of Technology & Invention*, medieval latrines are not even noteworthy enough to describe. The thrust of the discussion turns around the lack of sewage systems which the authors believe must have caused sanitation difficulties.[11] These treatments fail to notice the technological choices made about latrine construction and the flexibility of this relatively mundane technology.

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[10] For example, see Chapter 3, "The Odour of Sanctity" in Lawrence Wright, *Clean and Decent: The Fascinating History of the Bathroom & the Water Closet* (London: Routledge, 1960). The comment "In the Middle Ages conditions were certainly worse…" that begins Charles Singers' discussion of medieval sanitation after an extended treatment of the virtues of ancient sewage systems is typical: Singer et al., *History of Technology*, vol 2, 531–33.

[11] Maurice Daumas, *A History of Technology & Invention: Progress through the Ages*, vol. 2, trans. Eileen B. Hennessy (New York: Crown Publishers, 1969), 509–10. See also William Barclay Parsons, *Engineers and Engineering in the Renaissance* (Cambridge, MA: MIT Press, 1939), Chapter 16.

Archeological excavations have yielded evidence about the various technologies employed in latrine construction. Latrines basically consisted of a pit or box to hold the waste and some sort of structure on which the user sat. Often, archeological evidence of the structure itself is lacking. The excavations in Bergen have been an exception. In Bergen's commercial area of Bryggen, located near the wharf on the bay named Vågen, it was customary to have an indoor latrine, usually in the corner of the residence through the twelfth century. These latrines generally allowed multiple individuals to use them at the same time. Two and three-seat covers were common finds in Bergen, and even a four-seater was recovered (Figure 3-1).

Figure 3-1. Half of a four-person latrine seat recovered in Bergen. Photograph courtesy of Medieval collection, Bergen University Museum. Photo BRM-0249.

As the population grew in the later medieval period, rows of small latrines appeared in the narrow lanes between buildings and warehouses. Latrines like these in alleys were simply constructed as a box with removable walls so that the waste could be emptied or run out into the alley.[12] Økland found that the trend in the fourteenth century was to discontinue use of latrines within houses and to prefer latrines in overhanging galleries or separate stand-alone structures.[13] Norwich archeologists have also identified unlined cesspits datable to the late fourteenth to mid fifteenth century reflecting "the growing practice of using temporary storage 'bins' on site for rubbish which was later removed as night soil."[14]

Medieval illustrations show that latrines were often placed to allow direct disposal of excrement into water bodies. For example, in Pieter Bruegel the Elder's *Netherlandish Proverbs*, the patron of an overhanging latrine is shown prominently depositing his waste in the water below.[15] In Bergen, where many of the residences were located close to the bay, this was a convenient solution. An overhanging latrine from the sixteenth century Rosencrantz Tower in Bergen was drawn in the city plan of Bergen in the *Civitates orbis terrarum* and remnants of the structure still exist as shown in Figure 3-2. Archeological excavations in Århus indicate that latrines on one plot were arranged in a row towards a

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[12] Økland and Høiaas, *Bare Boss*, 7.
[13] Økland, "Det ureine avfallet," 56.
[14] Malcolm Atkin and D.H. Evans, "Excavations in Northern Conesford, in and around the Cathedral Close," in *Excavations in Norwich 1971–1978*, part 3, East Anglian Archaeology Report No. 100, ed. Malcolm Atkin and D. H. Evans (Norwich: Norwich Survey / Norfolk Museums and Archaeology Service, 2002), 31.
[15] Pieter Bruegel the Elder, *Netherlandish Proverbs*, 1559. Oil on oak panels. Staatliche Museen zu Berlin, Berlin.

slope which ran down to the town moat. In addition, a watercolor from the 1840s shows latrines overhanging the sea, a probable configuration from the medieval period.[16]

Some archeological excavations have unearthed complex medieval latrine technology. In Århus, a cesspit datable only roughly to the sixteenth or seventeenth centuries was specifically constructed to avoid ground seepage. Two 1.1 meter high barrels were stacked on each other with the top one extending just to the surface. The bottom barrel was drilled with holes to allow moisture to seep out, but the top barrel was lined with clay to keep the moisture from escaping at that height. The cesspit was presumably covered by a shed.[17] The construction technique indicates a working knowledge of liquid seepage properties from human wastes and an attempt to control liquids from surfacing or creating marshy conditions.

[16] Hans Skov, "The Infrastructure in Århus between 900 and 1600 AD," in Gläser, *Lübecker Kolloquium IV Die Infrastruktur*, 558–59.
[17] Skov, "The Infrastructure in Århus," 559–60.

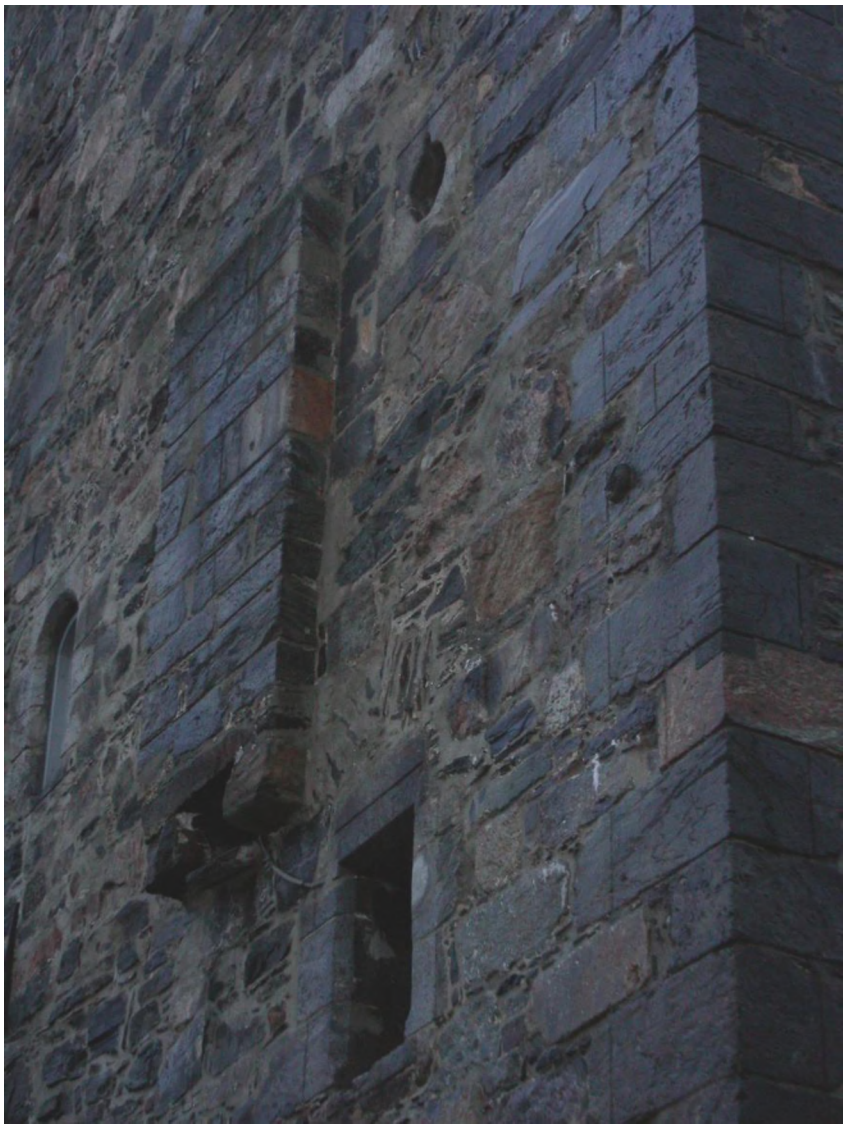

Figure 3-2. The visible remains of the overhanging latrine on Rosencrantz Tower in Bergen. Photograph by author.

Archeological investigations in Visby have revealed even more advanced latrine construction. In the thirteenth century, stone houses replaced older timber construction in the section of town nearest the harbor. In each house, a barrel-vaulted chamber was built under and against the foundation wall. A chute from the floors above brought waste into

the chamber and a manhole allowed access to empty and maintain the chamber. Over 70 latrine arrangements of this kind have been found in Visby. In some examples, an additional opening higher up in the chamber allowed water to be poured in and run across the slightly sloping chamber floor and out through a drainage hole. In these flushed cesspits, the outflow was taken through a drainage channel to the harbor. About 40 drainage channels have been found in Visby, mostly in the section with the stone houses. They all run in the direction of the harbor and can be found at depths up to 3 meters below street level. In some cases, multiple cesspits appear to have been linked together so that the same water flushed several chambers on its way to the harbor. Visby's extensive latrine and drainage system appears to have been planned during the town's reconstruction in stone and indicates much foresight about the problems of human waste disposal.[18]

Thus, as early as the thirteenth century, we find that town inhabitants thought about latrine construction and that they physically modified their built environment to integrate the latrines. Different latrine types have been found in archeological excavations within a relatively small area, including in the corner of a residence, in a separate attached room on ground floor, in a room on the second floor overhanging an alley, in between two buildings, and as a separate standing structure.[19] The wide variety of latrine configurations reveals a flexible technology that could range from a very simple pit to a

[18] Gun Westholm, "Sanitary Infrastructure in Mediaeval Visby," 491–98.
[19] Økland, "Det ureine avfallet" 29.

complete structure. With a wide range of possible construction techniques, medieval city governments found themselves in the precarious position of needing to regulate latrines.

## *Controlling Latrine Placement*

The first issue that medieval city governments attempted to control was latrine placement. The location of a latrine had a direct impact on neighbors and other city dwellers. Waste deposited in the latrine might seep onto others' properties or into the street; the stench might offend those passing by. As noted in Chapter 2, this could create a nuisance situation. Waste resisted being confined to its designated location; therefore, extra care had to be taken by the city officials to control it. Where were latrines constructed and what kinds of regulation did medieval city governments attempt to impose on them?

One type of regulation concerned the location of latrines in relation to the owner's property line and other building structures. Most of the Scandinavian cities in this study had regulations of this type, while the British cities do not. The earliest one is a 1269 city law from Ribe, Denmark requiring that latrines be built at least 14 feet from cemeteries, at least 10 feet from the nearest street and at least 6 feet from the nearest neighbor.[20] A Visby town law datable to the late thirteenth century insists that

> Anyone wishing to build a privy shall not build closer to his neighbor's well than 8 ft … it shall be both within his wall and within his foundations… If neighbors have a common wall, and if anyone wishes to build a privy, he must build on his

[20] Økland and Høiaas, *Bare boss*, 9.

> property so that he does not disturb the wall … Anyone building a privy in a timbered house, … the location above shall be 5 ft both from his neighbor's and the street.[21]

King Magnus Eriksson's Swedish town law of the fourteenth century included the provision that latrines could not be built next to the neighbor's property or by a public street with less than a 3-foot open drop-space. Anyone building a non-conforming latrine was ordered to remove it and fined 6 marks.[22] The Bergen city privileges from 1487 mandated that latrines could not be closer to the city street or their neighbor than a distance of 2 feet and were not permitted to discharge filth to the street or to the neighbor.[23] By requiring a certain distance from the latrine to the property line, these Scandinavian medieval governments were making human waste management a public affair. Excrement belonged in the private sphere, not on the public streets or running onto another person's property. The medieval city governments took it as their prerogative to manage this potential conflict among residents.

Were these restrictions followed? Contradictory archeological evidence exists. In spite of the 1269 law which clearly defines required spacing from latrine to property line in Ribe, archeologists have identified at least two standing structures as latrines which are

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[21] Quoted in Westholm, "Sanitary Infructure in Mediaeval Visby," 497–98.
[22] *Magnus Erikssons Stadslag i Nusvensk Tolkning*, ed. Åke Holmbäck and Elias Wessen (Lund: Carl Bloms Boktryckeri, 1966).
[23] Økland and Høiaas, *Bare boss*, 10. In the mid-16th century, King Christian of Norway issued a general requirement for city dwellers that "No one must have a Hyskende near the street or streets, so that it floods to another's property, but shall have it on their own soil and not [subject] their neighbor to any uncleanliness."

located directly on top of a boundary ditch to a plot.[24] But in Århus, Denmark, cesspits were almost always found at the back of property furthest away from other houses and the street. Cesspits there were relatively shallow, never more than one meter deep, in order to not reach the water table. Latrine waste in Århus was clearly handled separately from general household garbage and animal dung, which were typically spread on the plot, put in designated pits, or removed from the site.[25] From this physical evidence we see that the rules were sometimes, but certainly not always, followed.

## *Latrines and Ditches*

Written evidence confirming proper, or improper, latrine placement is sparse for most locations, but conflicts with the placement of latrines on ditches appear in two cities. In York, the issue appeared in 1419 when the treasurer and canons of the Minster of St. Peter complained that the ditch running along the city wall was clogged up. Because water could not freely pass there, several pastures were inundated and water even entered several buildings. The mayor decided to send searchers to investigate the situation and determine the cause. The searchers determined that the nearby parish church of St. John-del-Pyke, shown in Figure 3-3, as well as some other unnamed persons, had latrines on the dike between Monk Bar and Bootham Bar. The latrine owners were ordered to

[24] Jakob Kieffer-Olsen, "The Infrastructure of Ribe," in Gläser, *Lübecker Kolloquium IV Die Infrastruktur*, 548.
[25] Skov, "The Infrastructure in Århus," 558–60.

remove their latrines from the ditch and clean out the accumulated privy waste, weeds, and dirt from the ditch so that the water could properly flow through it.[26]

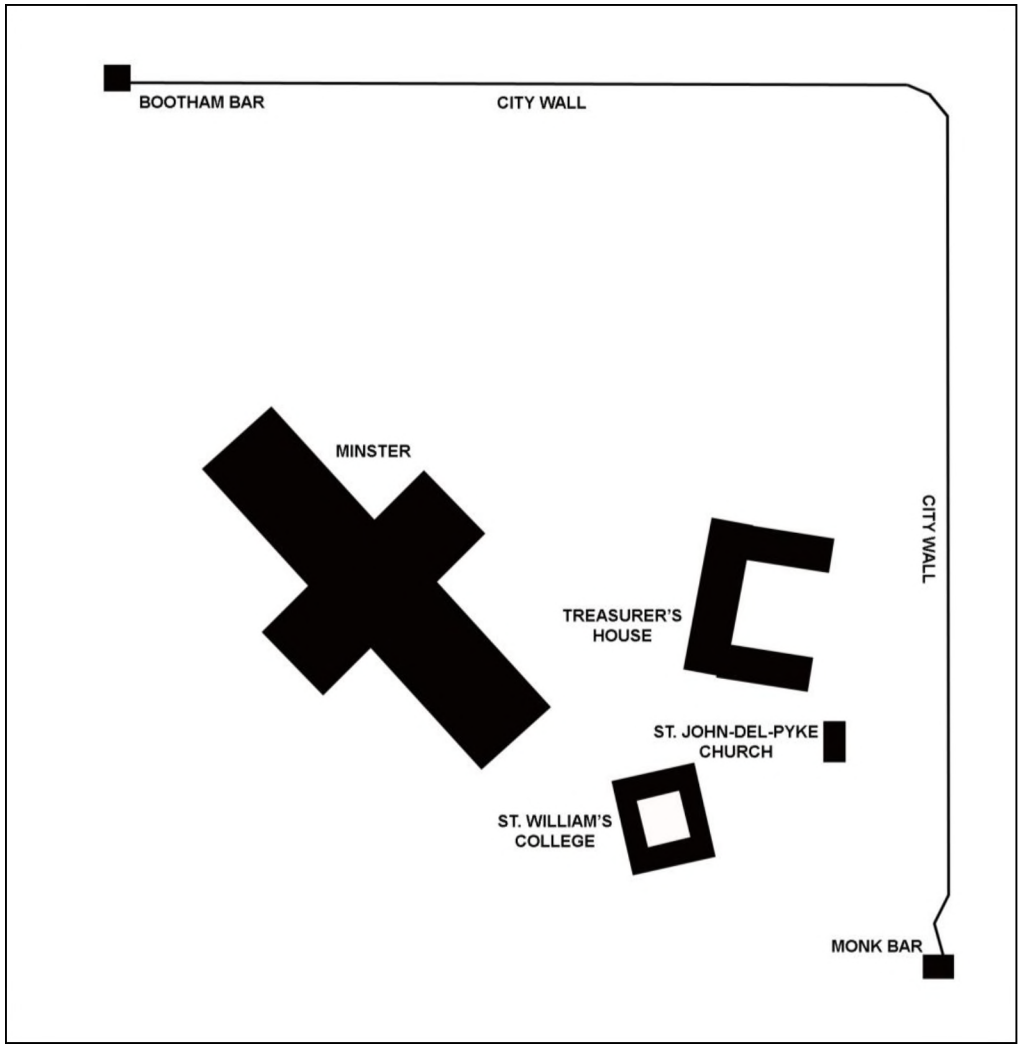


Figure 3-3. Area around York Minster showing St. John-del-Pyke church and the city walls. Based on "The Minster and its Precincts" from P. M. Tillott, ed., *A History of the County of York: the City of York* (London: Victoria County History, 1961), 340.

[26] James Raine, ed., *A volume of English miscellanies illustrating the history and language of the northern counties of England*, Surtees Society, vol. 85 (Durham: Andrews & Co., 1890), 14.

An extended case of the conflict over latrine placement appears in the Coventry records. The Coventry council faced an ongoing problem with latrine construction along a ditch in violation of city mandates. The conflict arose over latrines placed on Coventry's Red Ditch. The Red Ditch began at Greyfriar Lane and terminated at the Jordan Well within the center of the city. The ditch was not connected directly to the River Sherbourne which was located significantly further north within town; therefore, the Red Ditch had no outflow (see Figure 2-4). Although latrines were often placed near water bodies as discussed in a previous section, this was not a good location for latrines if the water body did not have enough flow to wash away the deposits. Such was the case with the Red Ditch.

In 1421, the Coventry city council required that "all the previes vpon the same Red-dychbe remouyd, & done away."[27] Two years later, the council reiterated that owners must remove all privies, as well as pig sties, on the Red Ditch. As of 1429, individuals were still making latrines on the ditch.[28] The council instituted a half mark penalty for anyone who constructed a new privy there. The council ordered the removal of latrines several times through 1470.[29] After 1470, the council does not again bring up latrines on the Red Ditch, so it would appear that one problem had been solved.

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[27] *Coventry Leet Book*, pt. 1, 31.
[28] *Coventry Leet Book*, pt. 1, 119.
[29] The issue comes up in 1443, 1446, and 1470 (*Coventry Leet Book*, pt. 1, 202, 227; pt. 2, 360). Each time, the council requires the removal of all latrines on the Red Ditch by Whitsunday or a fine will be levied. There was also a request for the mayor to inspect the Red Ditch in 1436 so that any defaults could be amended (*Coventry Leet Book*, pt. 1, 186).

However, it seems that although residents had removed latrines over the ditch, some had replaced them with drains directly from their home latrines. Although it is not clear in the records if these new drains (which appear first in 1508) indeed led from latrines, we know that the council considered these "draughtes" harmful to the Red Ditch and listed them along with swine sties as nuisances. Although the word "draughtes" appears to come from the word "draught," which means to draw away something, these "draughtes" clearly served as gutters taking material *into* the ditch, as a quote from 1538 says: "all persones haivyng or vsyng eny draughtes or other anoyaunces vpon or nygh the Reed-dyche, or eny sluses or other conveyaunces of water or filthe frome eny draughtes into the said Reed-diche, shall take vpp, remove & vtterlie adnull the same." The 1538 order also included a provision for the chamberlains of the city to scour the Red Ditch immediately after the removal of the draughtes, so the draughtes clearly served as some kind of gutters or drains carrying waste or wastewater into the ditch. The council issued commands to remove these conveyances from the Red Ditch in 1508, 1517, 1537, and 1538. [30]

So why did the council have to reissue this order so many times? The habitual placement of latrines or replacement drains on the Red Ditch was likely a function of private convenience. They had to build latrines somewhere, and many likely thought that the Red Ditch was better than cesspits close to their houses which would require emptying. Yet, the Coventry authorities did not see it this way. Through these regulatory

[30] *Coventry Leet Book*, pt. 3, 622, 652, 653, 727, 728.

acts, the Coventry city council attempted to create a cleaner urban space by specifying that latrines could not be built on a ditch with no outflow.

Should the case of latrines on the Red Ditch be seen as a failure by the city of Coventry to regulate citizen action? The evidence in fact indicates that the city was successful at temporarily enforcing their injunction, but with few viable, convenient alternatives, residents turned to illegal behavior. First, the spacing of the orders may indicate that new latrines were setup on the ditch at "generational" intervals: two orders in the 1420s, three in the 1440s, and one in 1470. It would seem that the latrines were removed after the order to do so, but then several years later, latrines were set up again, perhaps by different individuals. It is possible that in the intervening years, latrines did not exist on the ditch. Some residents obviously adapted their own sanitation solutions later in the early 1500 by installing drains to take waste to the Red Ditch instead of building latrines there. This issue appears several times over 30 years, indicating again that the problem was possibly addressed temporarily, but then new drains were set up. The issue does not appear after 1538, so it is possible that the drains were finally removed after that time, but this is not certain.

The example of the Red Ditch in Coventry reveals the ongoing nature of sanitation problems in the city. Forbidding the construction of latrines or waste gutters could only solve the problem temporarily. The waste needed to go somewhere, and residents attempted to find convenient solutions to their private needs. City governments, therefore, started to provide common waste services to meet these demands.

## *Providing Public Latrines*

Laws alone did not necessarily make a clean city. The creation of human waste was, and is, a biological necessity; as we saw above, medieval city governments found it difficult to regulate without alternatives. One way to control latrine placement was to provide permanent public facilities. The York civic ordinances included a requirement to provide four latrines in each of the four quarters of the city as of 1301.[31] We do not know if all four public latrines were set up, but we have records that the York city council financially and administratively supported a public latrine house on the main bridge over the River Ouse; latrines were installed in an arch of the Ouse Bridge below the *maison dieu* in 1367.[32] By the early modern period, the in-arch latrine had been replaced by the overhanging type from a building. In 1400, the Ouse Bridge financial records attest to the city paying 13s 8d for its yearly maintenance.[33] The city supported the latrine financially throughout the fifteenth century: in 1440, repairs at the entrance of the latrine house cost 12d. and in 1445 a laborer charged 8d. for his work on the latrine and another tenement on the bridge.[34] In addition, the city paid 6s. 4d. annually for oil to light the latrines at

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[31] Michael Prestwich, *York Civic Ordinances, 1301*, Borthwick Papers, No. 49 (York: University of York, 1976), 17.
[32] Barbara Wilson and Frances Mee, *'The Fairest Arch in England', Old Ouse Bridge, York, and its Buildings: The Pictorial Evidence* (York: York Archeological Trust, 2002), 54. Medieval bridges like Ouse Bridge were large stone structures that supported shops and residences on the bridge itself, much like the Ponte Vecchio in Florence still does. London had a similar large public latrine house on London Bridge by 1306 which served both the merchant and resident community of the bridge as well as visitors to the area (Sabine, "Latrines and Cesspools," 307).
[33] *York Bridgemasters' Accounts*, 122.
[34] *York Bridgemasters' Accounts*, 208, 257.

night.[35] In the days before wide-spread ambient lighting, a horn lamp with even a small flame would have made using the damp and dingy public latrine at night less difficult. The city also paid 2s annually for latrine cleaning. The cleaning woman Agnes Grethede appears to have complained in 1544 that latrine patrons were piling wood and other nuisances in the latrine house; the council agreed to remind citizens that the casting of construction waste or other filth in the house and directly in the river was prohibited.[36] The case of York's public latrines demonstrates the long-term commitment by the city council to manage human wastes in the city.

A similar tactic was taken in Bergen, but there the Hanse merchant association built a public latrine house on the Vågen in the central Bryggen district. Dedicated sheds with latrines were built away from the shipping docks so that waste could go straight into the sea. These simple sheds served as combination storehouses and latrines until 1898 and a replica of one has been constructed in the Bryggen district of Bergen (Figure 3-4). The later law books and court proceedings include prohibitions against defecating on other places except at the sheds on the wharf, even on cold winter days.[37]

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[35] *York Bridgemasters' Accounts*. The years 1445, 1454, 1459, 1462, 1464, 1468, and 1488 all contain entries of the annual payment for the light in the latrine house. Although the expense is not noted in all years, the city's payment would appear to have been "the custom" as noted in 1459. Several records name keepers of the latrine house light: the glover John Bukler in 1462 and 1464 and John Burell in 1468.
[36] *York Civic Records,* vol. 4, 122. The public latrines were eventually closed. In March 1579/80 it was decided that all privies on the Ouse should be removed. One drawing from the eighteenth century shows latrines in the building above the bridge.
[37] Økland and Høiaas, *Bare boss*, 10.

Figure 3-4. The reconstructed public latrine house in the Bryggen district of Bergen. Photograph by author.

In the medieval city, latrine placement could not be a private decision. Because of the potential to disturb others and create a dirty environment, government officials regulated latrine placement. To compensate for these restrictions, some cities turned to publicly financed facilities. Yet even after a latrine had been properly constructed, the city still faced the problem of human waste disposal.

## *Disposing of Latrine Waste*

Although one might be left in peace during the act of creating waste, once the waste was generated, city governments needed to regulate its disposal. Archeological evidence indicates that cesspits containing latrine waste were regularly emptied. Norwich excavations show that waste disposal patterns changed in the thirteenth century from in-place disposal to temporary storage onsite followed by offsite disposal.[38] Evidence from York indicates a similar shift by the beginning of the fourteenth century from unlined pits that remained filled to stone-lined cesspits that could be cleaned out.[39] This means that citizens regularly disposed of organic waste, thus city governments might need to monitor this activity.

The question of where waste should be disposed of was first and foremost on the minds of city elites. The Bergen city law of 1282 expressly forbade city dwellers from taking household waste and muck to the wharf for disposal in the bay.[40] The Stockholm city council ordered one woman to stop emptying chamber pots onto the street or using a barrel outside of her window to collect waste.[41] A 1443 mandate applicable in Copenhagen required that night soil be stored in a pit.[42]

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[38] Atkin and Evans, "Excavations in Northern Conesford, in and around the Cathedral Close," 12.
[39] P. V. Addyman, "The Archaeology of Public Health," *World Archaeology* 21.2 (Oct 1989), 257–58. Archeological evidence from Copenhagen also reveals a shift to brick-lined cesspits, but this occurs in the sixteenth century according to Johan Møhlenfeldt Jensen, "The Infrastructure of Copenhagen," in Gläser, *Lübecker Kolloquium IV Die Infrastruktur*, 536.
[40] *Norsk middlealder dokumenter*, ed. Sverre Bagge, Synnøve Holstad Smedsdal, and Knut Helle (Universitetsforlaget: Bergen, 1973), 174–75.
[41] *Stockholms Stads Tänkeböcker 1474–1483*, 213.
[42] Møhlenfeldt Jensen, "Infrastructure of Copenhagen," 535.

Unfortunately, we know little else about the disposal of latrine waste in this time period. Few of the city records clearly separate human and animal excrement, often calling a disposal site a muckhill or dunghill interchangeably. [43] The Coventry council clearly lumped both in together its restriction that "no man carry no dung out of his house nor out of his stables into the street, but if they have carts ready to carry it away."[44] At other times, the orders specifically addressed animal manure, such as in 1473 when the Coventry council reminded those with stables in Catesby lane not to throw muck in river or make muckhills but rather carry the dung away as it was made.[45] The next chapter will explore the disposal of dung and muck as part of attempts to control urban animals. There may have been distinctions about the disposal practices of human versus animal waste that are lost to the modern historian.

## *Making Private Matters Public*

As we have seen, although the act of creating waste was generally a private affair in the late Middle Ages, the infrastructure around it certainly was not. City governments attempted to control latrine placement and waste disposal, as the above cases illustrate. The question we are left with is why: Why did the city governments care about latrines?

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[43] Both human and animal wastes are referred to as "dung" and "muck." Animal manure was likely a more substantial problem in the urban setting than human excrement, as discussed in Chapter 2. Most excrement was confined to waste pits and could be emptied in a controlled fashion, whereas cattle and horse manure is generated in large quantities and typically piled in stables, pens, and on the street. The council of Stockholm, for example, had to specifically order everyone with a stable to clean it in 1519 (*Stockholms Stads Tänkeböcker 1514–1520*, 215).
[44] *Coventry Leet Book*, pt. 1, 30.
[45] *Coventry Leet Book*, pt. 2, 388.

Previous scholarship tends toward understanding latrine regulation in terms of civility, but the evidence indicates that the physical constraints of living in an urban environment forced city councils to address latrine wastes. Medieval households, workplaces, and animal stables co-existed in relatively close quarters. Although population sizes of all of these towns which ranged from a few thousand to perhaps 10,000 in York was relatively modest compared to continental counterparts, which were typically upwards of 20,000 inhabitants, the urban waste generation was not insignificant, as discussed in Chapter 2. Conflicts between inhabitants and uses of property, streets, and rivers required diligent management. The city governments were not, in fact, making waste more secret and shameful through regulation, but rather more public.

By initiating latrine regulations covering both their location and their wastes' final disposal, medieval city governments not only managed their urban environment – they also redefined the role of city government. The government itself became active in providing services to properly handle organic waste, allocating resources of both money and personnel to the problem. This increased the reach of the city government into the daily lives of residents. Yet the government alone could not manage latrine waste; it clearly needed the cooperation of the residents to maintain a clean city. This is a theme to which we will return in Chapter 6.

# 4

# Limiting Livestock

> Whereas great injuries and dangers so often have happened before this time in the City of Norwich and still happen from day to day in as much as boars, sows and pigs before this time have gone and still go vagrant by day and night without a keeper in the said city, whereby divers persons and children have been hurt by boars, children killed and eaten, and others [when] buried exhumed, and others maimed, and many persons of the said city have received great injuries as wrecking of houses, destruction of gardens of divers persons by such kind of pigs upon which great complaint is often brought before the said Bailiffs and Community imploring them for remedy on the misfortunes, dangers and injuries which have been done to them...
>
> Norwich Book of Customs entry, 1354[1]

Norwich in the mid-1300s faced a huge problem. Swine were running loose in the streets, damaging property, killing children, and rooting up bodies from the cemetery. Something clearly had to be done. So the city leadership decided that all pigs had to be kept in their sties both day and night. If an animal was found wandering the city at large without a keeper, the finder or anyone else willing to do so could kill the pig without penalty. Every Saturday from noon until the evening, the owner could allow the pigs to go out of their

[1] *Records of the City of Norwich*, 205–6. Original text in French; translation provided by the volume editors.

enclosure in order to clean it, although the owner still had to ensure that the pigs caused no injury while out of the sty. As soon as the sty was cleaned, the pigs had to be returned to it. This incident shows us that when animals became an urban nuisance, the city government took steps to address the problem.

This chapter explores the control of urban livestock and the management of manure. As noted in Chapter 2, animal wastes were the most significant waste category in the late medieval city. The population of 10,000 people generated a bit over 900 cubic meters of solid waste each year – but this quantity was matched by only 500 horses. If 500 pigs were kept in town, another 250 cubic meters of dung required disposal. And unlike human waste which was generally deposited in a cesspit, animal dung was piled above ground, making it more visible and odoriferous. It should come as no surprise, then, that late medieval city governments regularly attempted to manage urban livestock keeping practices.

In histories of modern sanitation, pigs are typically mentioned as commonplace urban garbage scavengers in the nineteenth century city and horses (and their manure) are seen as the primary environmental issue. Little is said about any earlier attempts to control animals in the urban space, and there is an underlying assumption that pre-industrial cities must have been as "organic" as the nineteenth-century ones with swine running amuck.[2] In Zupko and Laures' examination of Italian city laws, they found only a

[2] See for example Melosi, *Garbage in the Cities*, Chapter 1. Ted Steinberg in *Down to Earth: Nature's Role in American History* (Oxford: Oxford University Press, 2002) writes, "In the nineteenth century … it would be impossible to imagine such places [urban areas] without the creatures that roamed the streets, not to mention the stinking piles of excrement they left behind….Thus did life proceed in the organic city….In

few restrictions on urban animals, particularly limitations on the amount of time animals could be kept within the town walls and requirements for prompt dung cleanup.[3] Even in a study specifically about the history of pigs, Hans-Dieter Dannenberg records only one German city law limiting the number of pigs per inhabitant and makes the statement that pigs often ran around freely.[4] Considering the scope of the problems associated with urban livestock, more should be said about how cities controlled these animals and their waste products in order to provide for sanitary living conditions. This chapter, then, looks at what restrictions were placed on where animals could go, whether or not they could be in the city, and how dung was managed.

## *Not Roaming Free*

All of the cities reviewed restricted where urban animals were permitted to go. City governments were particularly diligent about restricting the frequency of pigs roaming free in the urban space. Based on the Norwich experience cited above, it is easy to see why.

Coventry forbade pigs on the high street, in urban gardens, and in urban pastures where "they may do harm." The swine keeper could drive the swine only to empty fields

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the late nineteenth century, reformers bent on sanitation put an end to the city in its down-to-earth form." (159).

[3] Zupko and Laures, *Straws in the Wind*, 51–2. Nicholas also mentions a Nuremburg law also limiting the number of pigs brought into the city at one time and the requirement to keep pigs in pens (*Later Medieval City*, 331).

[4] Hans-Dieter Dannenberg, *Schwein haben: Historisches und Histörchen vom Schwein* [Keeping pigs: Histories and anecdotes about pigs], Jena: Fischer, 1990. The phrase "schwein haben" actually means "good luck" in German. The only significant history of the pig written in English does not deal with the period before 1700: Robert Malcolmson and Stephanos Mastoris, *The English Pig: A History* (London: Hambledon, 2001).

in and around the city. Fines were established for each offence.[5] In 1444, the council reiterated that no one could keep pigs any where in the city "to the injury of his neighbours."[6] People could also not keep pigs in their stalls by the street. Butchers were not allowed to tie livestock to their door.[7] Butchers were also told not to take their pigs to the disposal pits to feed on butchery entrails or other "filthy" material.[8]

York appears to have addressed urban pigs in a similar fashion. In the earliest city ordinance from York, dated to 1301, no one was permitted to keep pigs that roamed the streets either in day or night.[9] An ordinance of 1377 titled "De porcis euntibus" [of pigs going about] set a fine of 4d. if a pig was found wandering in the city during the day or night. The sergeant or other officer who found the pig could kill it if he wanted to as well as receive the 4d. fine. In addition, pigs and other beasts were not permitted on the walls of the city.[10] In 1398, the York council specified that pigs were not permitted during the day or night on the walls of the city, in the market streets, in alleys, on the Ouse Bridge, or on the quay. The master of the pig would be fined 6d. for each offence and the person who caught the pig would receive 2d. of the fine.[11] The York council ordered all people with swine roaming the streets in September 1555 to remove them immediately. The

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[5] *Coventry Leet Book*, pt. 1, 27–28.
[6] *Coventry Leet Book*, pt. 1, 217.
[7] *Coventry Leet Book*, pt. 1, 42–43.
[8] *Coventry Leet Book*, pt. 2, 389. This is an interesting command since it is not until the 1890s that scientific investigations in the U.S. began to question whether or not swine fed on garbage were fit for human consumption. Even though the practice was discontinued after these studies, many places resumed the practice during World War I. During the 1930s, studies once again linked pigs fed on garbage to disease and the practice was slowly phased out. Melosi, *Sanitary City*, 180, 270, 273.
[9] Prestwich, *York Civic Ordinances, 1301*, 16. The whole sentence is "No one shall keep pigs which go into the streets by day or night, nor shall any prostitute stay in the city," which suggests that pigs and prostitutes were somehow linked. Perhaps both were considered filthy and morally unacceptable.
[10] *York Memorandum Book*, pt. 1, 18.
[11] *York Memorandum Book*, pt. 1, 164.

council made a point to specify that even the master of St. Anthony's had to obey the order.[12] This was necessary because traditionally the Hospitallers of St. Anthony were allowed to tie a bell around a pig's neck and let it run freely to forage in the city, and no one would harm the pig. Bells and pigs became prominent in later medieval iconography of St. Anthony because of this tradition.[13] Although St. Anthony's pigs were allowed to run free in many cities, they were an exceptional case; the city records indicate that pigs were usually herded and strictly controlled.

Most often the cities required that residents keep their pigs in pens. As the Norwich case which began the chapter illustrated, pigs had to be kept within sties except when dung was being removed. The Norwich council also ordered that owners would forfeit all pigs and ducks roaming the streets of the city within fourteen days of their ordinance of 5 November 1437.[14] In Nottingham, the mayor ordered that all swine had to be kept within the owner's house or a sty. The mayor's order is recorded as part of a lawsuit filed by John Bank of Nottingham in 1398. John claimed that Robert Hayward had allowed his pigs to roam free contrary to the mayor's ordinance and the pigs

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[12] *York Civic Records*, vol. 5, 129.

[13] For discussions of St. Anthony's pigs in London see John Strype, *Survey of London* (1720), vol. 1, book 2, 120, http://www.hrionline.ac.uk/strype/TransformServlet?page=book2_120 and "Threadneedle Street," in *Old and New London*, vol. 1 (1878), 531–44, http://www.british-history.ac.uk/report.asp?compid=45064. See also David H. Farmer, *The Oxford Dictionary of Saints*, 4th ed. (Oxford: Oxford University Press, 1997), 27 and the extended discussion of St. Anthony's association with pigs and the liberties of St. Anthony's pigs in C. L. ten Cate, *Wan god mast gift…Bilder aus der Geschichte der Schweinezucht im Walde* [When God gives mast…Pictures of the history of keeping swine in the forest] (Wageningen, Netherlands: Centre for Agricultural Publishing and Documentation, 1972), 140–53. Melosi mentions that when a law was passed forbidding roaming pigs in Paris in 1131, the monks of St. Anthony's protested it because of the potential lost income (Melosi, *Garbage in the Cities*, 5).

[14] *Records of the City of Norwich*, vol. 2, 88.

devoured a cock and some red herring that belonged to John, causing 10s. in damages. The outcome of the trial is not recorded.[15]

Yet the city leadership did not let individuals place pig sties wherever they wanted. Coventry, for example, had to order the removal of pig sties on the Red Ditch several times. The pig sties appear alongside the latrines which are discussed in the previous chapter, as nuisances in these cases.[16] Obviously the ditch seemed like a good place to put both human and animal waste to some of the urban inhabitants, but it was unacceptable for the city at large.

Additionally, the cities required keepers to walk with the pigs when they were moved through town. As early as the mid-1100s, the Aberdeen city law required that a keeper follow swine into the fields or the swine had to be kept in a sty.[17] Nottingham annually appointed an official keeper of the swine. The keeper ensured that the pigs did not do any damage to urban walls or gardens.[18] The provision of a city-appointed keeper stresses the governmental involvement in controlling urban animals.

## *Moving Animals Out of the City*

Another tactic was to forbid animals in the city altogether. In 1423, the Coventry council decided that no one, including butchers, would be permitted to keep swine in sties, stalls,

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[15] *Records of the Borough of Nottingham*, vol. 1, 357–59.
[16] *Coventry Leet Book*, pt. 1, 58–9 (1423); pt. 2, 360 (1470); pt. 3, 653 (1517).
[17] *Ancient Laws & Customs of the Burghs of Scotland*, vol. 1, 41.
[18] *Records of the Borough of Nottingham,* vol. 1, 151, 269. Ralph Pollard sued the swineherder Nicholas in 1395 for allowing the pigs to damage Ralph's garden. Ralph claimed that Nicholas did not look after the swine properly. Nicholas, however, said that swine had always been herded to the place in question, so the damage was not his fault. The judgment was made in favor of Nicholas (269).

or houses from then on. Violators would be fined 3s. 3d. and forfeit the pig.[19] When the city listed all of the duties of aldermen in 1517, they included ensuring that there were no swine sties within the walls of the city as one of the duties.[20] It appears that such restrictions were enforced, at least some of the time. The baker John Lichefield was fined 6 s. 8d. for "kepying swine within the Cite" of Coventry in 1540.[21]

York similarly commanded that no swine could be kept in the city or the suburbs, whether in sties, houses, or any other place, in 1498. The reason for the order was "the foule corrupcion that cometh of theym."[22] But such a blanket order to remove all pigs from both the city and suburbs does not appear to have been successful in the long run. In 1541, the council required the removal of urban livestock as part of a program to clean up the city before a visit by King Henry VIII. Cattle and swine had to be taken out of the city and suburbs until after the king and queen had departed. Obviously, by this time – 43 years after the order to remove all swine – people were once again raising pigs within the city. The measure to remove them for the visit went along with everyone laying fresh gravel and sand on all of the streets.[23] A similar order is recorded for 1549 prior to the visit of the Earl of Shrewsbury. In this case, all swine sties were to be pulled down and all swine removed from the city before the visit. Violators would be assessed a 6s. 8d. fine

[19] *Coventry Leet Book*, pt. 1, 58.
[20] *Coventry Leet Book*, pt. 3, 652–53.
[21] "Extract of Fines and Amercements 1540–41," 242.
[22] *York Memorandum Book (B/Y)*, 217–18.
[23] *York Civic Records*, vol. 4, 64.

for each pig. In addition, the council commanded the ward constables to oversee the removal of dung and filth from the streets.[24]

Stockholm also ordered the removal of swine from the city in 1563. The pigs were identified as the source of a "difficult and evil stench" which caused a "summer sickness." Therefore the council agreed that the pigs should be taken out of the city and sold to pay for poor relief.[25] In a 1557 letter from King Gustav to the city government, it is clear that no one was permitted to have herds (cows, pigs, or others) within the city walls.[26]

These steps by the city councils to remove all livestock from within the city walls appear to have met with limited success. But their attempts at controlling the urban environment should not be underestimated. The spacing of the issues in all the cities indicates that the problem of urban livestock, particularly pigs, was most rampant in the later 1300s and subsequent orders seldom appear, perhaps every 50 years.

## *Dung Disposal*

The most pressing problem with urban livestock was what to do with dung. The problem of improper livestock waste disposal is evident when authorities fined residents who threw their muck into the streets, ditches, and rivers. In Nottingham, for example, we have numerous jury presentments for placing muck in the road. Of the 34 citations on 13 October 1407, 20 of them deal with improper dung disposal. Dung had been placed in the

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[24] *York Civic Records*, vol. 5, 25.
[25] *Stockholm Stads Tänkeböcker 1553–1567*, 224. The Swedish is "swåre och onde stanck, som går aff thom, fórorsakes jn på szomaren en swår siukdom aff etc."
[26] *Privilegier, resolutioner och förordningar för Sveriges städer*, vol. 2, 352.

streets, in the common caves, in front of doors, and in a churchyard.[27] A 1512 Nottingham court session also cited 27 people for throwing muck onto an unfenced parcel owned by the abbot, 16 individuals for disposing of muck at the end of Cowlane, and one person for making a muckhill in front of a house. In the surviving Coventry court records from 1540–41, there were two citations about dung: Walter Lacy, a plumber, cast dung and filth into a gutter and the carrier William Shawe laid dung in the highway outside of New Gate.[28] In Aberdeen, Scotland, the council forbade the creation of muckhills within the city several times.[29] These records indicate that some individuals tried to dispose of organic wastes on the urban streets or vacant land, but that the authorities did not tolerate such behavior.

Dead animals could also pose a sanitation problem. In 1391, the Norwich leet court fined William Gerard for leaving a dead horse lying in the street for such a long time that the air was poisoned.[30] Also Stockholm must have had frequent disposal of dead animals, particularly dogs, in the streets. The king's letter of 1557 commanded that no dead animal should be put in front of anyone's door. All carcasses should be taken within two hours of the opening of the city gate to the designated disposal location. A fine of 3 marks was set for non-compliance, with one-third of the fine going to the person who reported the violation.[31]

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[27] *Records of the Borough of Nottingham,* vol. 2, 39–43.
[28] "Extract of Fines and Amercements 1540–41," 238–39.
[29] *Early Records of Aberdeen 1317, 1398–1407*, ed. William Croft Dickinson (Edinburgh: Scottish History Society, 1957), 81–82, 109, 154.
[30] *Leet Jurisdiction in the City of Norwich*, 75.
[31] *Privilegier, resolutioner och förordningar för Sveriges städer*, vol. 2, 355–56.

## Designated waste disposal areas

To combat improper waste disposal practices, medieval city governments went beyond simple legislation ordering proper disposal – they identified allowable disposal locations and even provided cart services to take waste out of the urban area. These two steps show the willingness of the city councils to set up physical infrastructures to deal with the animal waste issue.

Dunghills and waste pits generally sprang up around the perimeter of the town outside of the heavy populated sections. Some city councils went to great pains to name permissible disposal sites. In Stockholm, for example, a 1482 proclamation lists all of the places where waste disposal was forbidden and required individuals to "take it where the marks stand above the hills."[32] In 1489, the Stockholm council agreed that places both east and west of the city should be identified for the regular disposal of waste from the urban area.[33] The council established specific waste sites at the hills and people later called the area "flugmöten" which means "fly-meeting," an appropriate name for a waste pile.[34]

By 1427, Coventry had five designated waste disposal locations: a dunghill outside of the city limit beyond Greyfriar Gate, a pit in the Little Park Street Gate, a muckhill near the cross beyond New Gate, at Derne Gate, and a pit at Poddycroft. All of

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[32] *Stockholms Stads Tänkeböcker 1474–1483*, Burspråk 1482, 489. The named places where waste was forbidden are "the Strömmen, the big market, Fiskestrand, Kogghamn or Slottsbacken [hill by the castle] or Gråbrödra bridge or Kornhamn."
[33] *Stockholms Stads Tänkeböcker 1483–92*, 328.
[34] Dahlbäck, *I mideltidens Stockholm*, 114.

these locations were just beyond a city gate as shown in Figure 4-1.[35] Because disposal sites were generally just beyond the city gates, residents sometimes did not bother to carry their refuse all the way to the pit or heap, but rather piled it around the city gate. In 1554, the council ordered that "no person lay eny dunge or fylthe nighe or abowte the gates or the barres of thys Cytye."[36]

In spite of these orders, it appears that some urban residents dumped animal waste in local churchyards, which were large open spaces within the urban area. In 1471, for example, the Coventry council ordained that noone should throw muck, straw, or other filth into the parish churchyards.[37] Stockholm fined two men, Peder Olsson and Andres Staffansson each 12 marks for disposing of filth in the Greyfriar's neighborhood.[38] Churchyards, because of their intraurban location and large open spaces, obviously looked like usable garbage dumps to many residents. In fact, after the monasteries were disbanded by the English King Henry VIII, the York council specified the old Dominican friary as a permissible dung disposal location.[39]

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[35] First three listed in *Coventry Leet Book*, pt. 1, 29–30; "Allso that they Carry a-way ther offall of ther beestys in-to the pitt vndur the Poddy Crooft" (*Coventry Leet Book*, pt. 1, 43); and the New Gate location is described as a muckhill on the right hand side of the cross beyond New Gate (*Coventry Leet Book*, pt. 1, 113).
[36] *Coventry Leet Book*, pt. 3, 810.
[37] *Coventry Leet Book*, pt. 2, 372. The injunction was repeated twice specifically in the 1540s for St Michael's and Trinity churchyards (pt. 3, 759–60, 792), indicating that waste disposal there must have been habitual.
[38] *Stockholms Stads Tänkeböcker 1483–1492*, 133.
[39] Angelo Raine, *Mediaeval York: A Topographical Survey Based on Original Sources* (London: John Murray, 1955), 245.

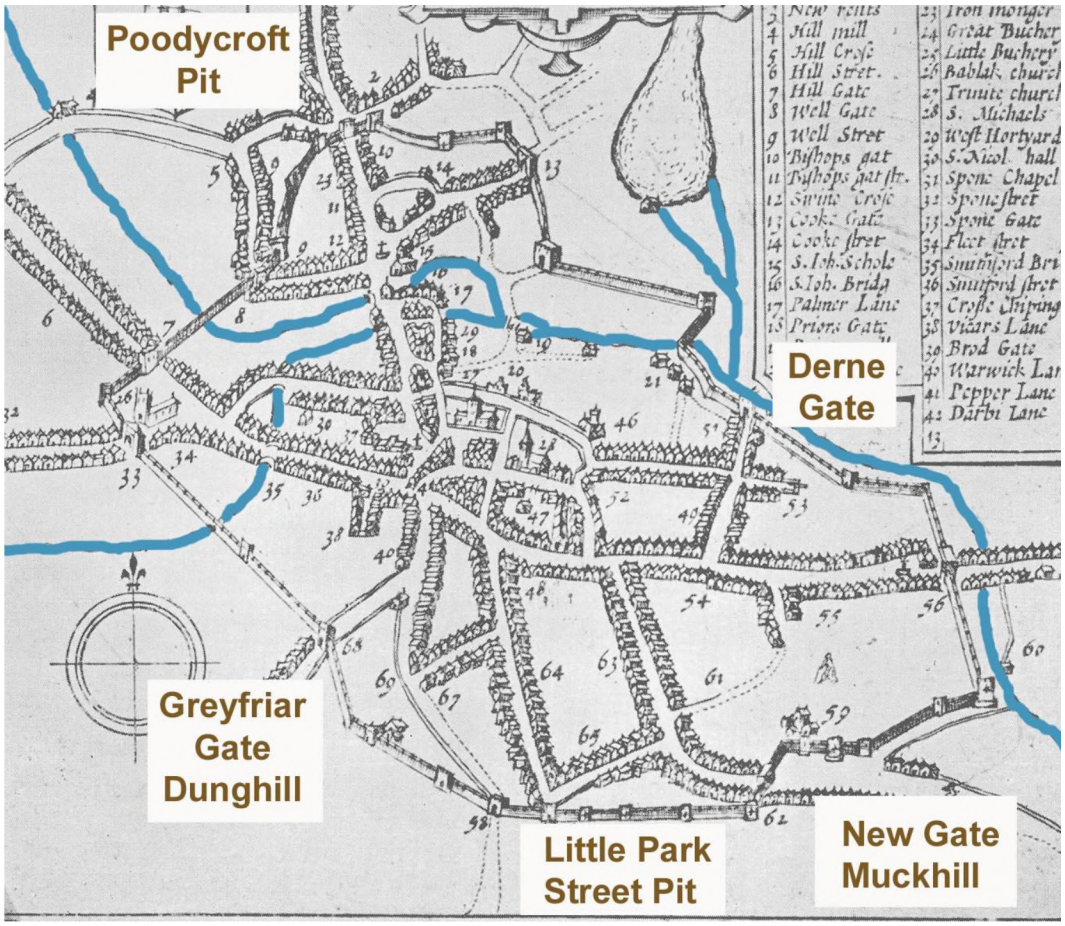


Figure 4-1. The locations of Coventry's waste disposal sites. Base map is John Speed, *The Theatre of the Empire of Great Britaine*, Map of Coventree, 1611. Locations compiled from the *Coventry Leet Book*.

Although city governments actively regulated waste disposal within the city, particularly forbidding waste disposal in rivers and ditches, they saw the value of flowing water for ridding the city of waste. Norwich used river disposal via a barge taken below the chains on the city bridge where the waste was then dumped into the river. The council restricted the carrying of "muck" on the river to one person who was given a monopoly on waste disposal. When the council gave Richard Hert this privilege in 1453, Richard swore that "he shall carry the said muck into and out of his boat by a barrow, and he shall

not cast any muck within the chain."[40] As this case demonstrates, the city elites were concerned with where animal waste would end up and attempted to regulate its disposal.

## Dung Cart Services

The English cities were quite active in managing waste disposal by providing for city-run cart services. In York, the council mandated that a dung cart be placed in every ward.[41] In Norwich, the council provided two weekly muck carts to serve nine parishes.[42] In Coventry, the council gave the right for a carter to collect 1d from every resident and shop on a quarterly basis for his weekly street cleansing and waste removal services in 1420.[43] In 1452, every person who owned a shop was reminded of their requirement to pay the 1d tax.[44] The constable of each ward ensured that the weekly cart service was provided. Anyone refusing to pay would be referred to the ward's alderman and required to pay double.[45]

The cart services collected organic waste for use in manuring land. Excrement, both human and animal, as well as putricible household matter employed as fertilizer became a commodity instead of waste. Coventry's council forbade the disposal of stones, construction material or other filth at the Greyfriar muckhill so that the waste pile could

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[40] *Records of the City of Norwich*, vol. 2, 91. It is interesting to note that Norwich did not consider the damage that its waste might have on downstream neighbors. Yet this does not appear to be unusual. A search of the Parlimentary Rolls for England from 1272 to 1504 yielded no cases where one city complained about another's upstream waste. All instances of bothersome waste recorded in the rolls were confined to one city.
[41] *York Civic Records*, vol. 2, 165.
[42] *Records of the City of Norwich*, vol. 2, 110.
[43] *Coventry Leet Book*, pt. 1, 21.
[44] *Coventry Leet Book*, pt. 2, 273.
[45] *Coventry Leet Book*, pt. 2, 552–53.

be used by local farmers as manure.[46] York ordered that the dung should be carried out of the wards so that "husbands of the contre" could make use of it. [47] Until 1550, it appears that people in York paid for this commodity. In that year, York's mayor issued a statement that now any person could take dung from the city's multiple dunghills free of charge for manuring fields.[48] Mixed waste, i.e. human waste lumped in with household garbage, could cause problems because it became unusable. The institution of city services funded by the city councils attempted to remedy the problem.

Hauling waste out of the city could create its own problems. In 1524, York's council decided that heavy dung carts carrying waste out of the city for application on nearby farms were damaging the urban roads. The city councilmen lamented the fact that many streets which had been "newe pavyd to the great costs and chargs of the inhabitaunts" were now damaged and broken, even to a worse degree than before they were paved, causing "great damages of the forsaid inhabitaunts and unclenlynes of the said Cite." The council, therefore, outlawed the use of standard carts with iron wheels within the city and required sleds or carts equipped with wooden wheels.[49] Again, waste

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[46] "[Enacted] that noon inhabitaunte of thys Citie shall from hencefurthe caste any stoones, Raymell, or other fylthe or purpresture, vppon the Grey-freer dunghyll or neere vnto the same, Excepte good mucke or dunge or cleane yearthe" (*Coventry Leet Book*, pt. 3, 804). We know that this "pure" dung was used by Coventry-area farmers because of an complaint recorded in 1480. The Prior of the cathedral church complained that the residents of Coventry were disposing of waste improperly on church property: "Where of late tyme they leyde ther nothyng but swepyng of their houses, which was carryed a-wey be men of the Contrey to donge their londe; and now be-cause they ley there her Ramell ther will no man Carry a-wey there as they were wont to doo, and so hit encreseth dayly more & more to the hyndraunce & grete hurt of the seid Priour" (*Coventry Leet Book*, pt. 2, 447).
[47] *York Civic Records*, vol. 2, 165.
[48] *York Civic Records*, vol. 5, 48.
[49] *York Civic Records*, vol. 3, 90–91.

disposal was a highly regulated activity. City councils found that they could not leave waste disposal practices solely within the hands of their citizens.

## *Setting Limits*

This chapter has shown that the late medieval city governments of England and Scandinavia instituted multiple types of restrictions on urban animal inhabitants. Previous literature has suggested that animals went largely unmolested freely through the medieval town, but the evidence from these cities does not bear this out. Pigs, in particular because of their destructive behaviors, were closely controlled and were not permitted to roam the city. When pigs were not tightly controlled, injured parties were not afraid to file lawsuits, indicating the unacceptability of free-roaming swine. Dung posed the greatest environmental problem – so the cities went beyond simple legislation to implementation of technological solutions to dung disposal. They coordinated dung removal services and designated allowable disposal locations, increasing the city government's direct involvement in sanitation provision. These provisions moved the leadership's role in sanitation beyond talk to action, a theme which will be explored further in later chapters.

# 5

# Regulating Business in the Borough

In their plan for cleaning the River Wensum in 1532, the Norwich city council identified the businesses that they thought were particularly troublesome. They agreed that these craftsmen should be charged more than the average resident for river cleaning: "Provided that barkers, dyers, calaundrers, parchementmakers, tewers, sadelers, brewers, wasshers of shepe, and all suche great noyers of the same rever tobe ffurder charged than other persons shalbe…."[1] Twenty years later, the Norwich council reiterated their stance on polluting industries, authorizing the mayor, alderman, and Council of 12 to tax "all such commen noyeours dwelling uppon the ryver that doo or shall hereafter annoye the same, as dyers, calendrers, tanners, glovers, parchemyn makers, brewers and encrochers of the river" The amount of the tax was left open to their discretion. They also had the right to tax the miller in order to pay for cutting weeds in the river.[2] As we see, Norwich's list of polluters is quite comprehensive: textile manufacturing (launderers, washers of sheep skins, dyers), leather working (barkers, tawyers, saddlers, tanners, glovers, and parchment-makers), and brewers. These particular trades consumed significant quantities of water and often generated noxious wastes which contaminated water sources. Norwich

[1] *Norwich City Records, vol. 2*, 115–16.
[2] *Norwich City Records, vol. 2*, 129.

councilmen therefore felt justified in levying higher environmental taxes on these businesses than average citizens.

The Norwich lists can provide a starting point for a more general inquiry into the environmental aspect of the relationship between medieval business and borough. Norwich singled out the three groups of troublesome crafts – textile manufacturing, leather working, and brewing – as environmental problems. Records for the other cities name these same occupations as environmental threats as well. Although not named by Norwich, butchery was also an industry subject to strict environmental regulation in almost all of the cities.

Although industry was vital to the urban economy, the medieval city councils were unwilling to overlook the environmental consequences of many craft operations. This chapter will explore measures taken to control the urban environment by regulating businesses. We will see that the authorities recognized potential polluters and created environmental laws to limit damage to both property and residents. This will show that the physical environment constrained the medieval city governments' regulation of business interests.

## *The Place of Industry*

So how important were the "polluting" crafts in the urban milieu? From medieval lists of taxpayers and citizens, historians have reconstructed the general employment scene in

various cities.[3] A detailed study of Norwich's economy from 1275 to 1348 showed that almost half of the working population was in manufacturing, a quarter provided food and drink, 15% were merchants and traders, and the remainder provided services, worked in the building trades, or were artists. Leather and cloth working were the largest manufacturing industries in Norwich.[4] Records for Coventry show a similar picture: of the 739 persons named in fourteenth and early fifteenth century records, there were 211 (29%) in the cloth trades, 132 (18%) merchants, 108 (15%) metal workers, 80 (11%) in the production of food and drink, 79 (11%) in leather and fur trades. The cloth trades, therefore, dominated the town economy, although metal and leather working were also significant. Members of the leading crafts were influential in city government – by 1450, the guilds of the drapers, dyers, smiths, shoemakers, and whittawers (white tanners) all had members who had held city offices.[5] Textile manufacturing in the late fourteenth century likewise dominated York, with about 28% of the freemen involved in the industry. It appears, however, that the textile crafts suffered decline and contraction in the

[3] This is a notoriously labor-intensive and difficult process. Many of the reconstructions are made by looking through property transactions, city tax lists, and other city council records for persons with identified trades. The problem with such an approach is that we typically get only property-holders or free citizens in the records. Even in the most complete records, we have a listing of only 10 to 15% of the urban population. Women (when not identified in a trade), children, and the elderly are absent from the counts. In addition, non-citizens, including servants and apprentices, are typically not included. Because almost all households had at least one servant and most craftsmen had at least one apprentice, these populations are quite significant. However, these figures still give an indication of the relative importance of different trades in the medieval city.

[4] Rutledge, "Economic Life," 160

[5] Stephens, *City of Coventry and Borough of Warwick*, 151–57. The occupational structure is confirmed in a list of crafts and their members (603 persons) contributing armor for the defense of the city in 1450: 40% cloth industry, 20% metal, 14% leather and fur, and 10% food and drink.

fifteenth century.[6] In Stockholm, 35% of the 381 taxpayers were carpenters, fishermen, shoemakers, or tailors, and leatherworking was big business with four pouch-makers, nine belt-makers, ten skinners, three saddle-makers, and 25 shoemakers. Although there were many tailors in town, cloth production was only a minor concern.[7] These figures reveal the significance of crafts to the medieval urban economy. Of particular importance for this study, we see that cloth working, leatherworking, and victualing comprised high proportions of the working population in the English cities. These trades are the ones that became the target of environmental urban laws.

In the Middle Ages, businesses of the same type tended to be located together in specific parts of town. Modern streets with names such as Fishmongers Row and Shambles Street are legacies of this practice. Historians have identified where the different trades operated in some cities based on property records, naming evidence, and archeological finds. Figures 5-1 through 5-4 show the known locations of the "environmentally damaging" trades in the major cities in this study. Location plays an important role in the discussion of environmental effect of each industry. As the maps indicate, many of the polluting craftsmen set up shops near a source of water, either the river or harbor. This provided a steady source of water, as well as a potential disposal ground for wastes. Most of the trades in question also took place on the outskirts of town; butchers were the major exception, although we will see that there were attempts to move

[6] Tillott, *City of York*, 84–91.
[7] Dahlbäck, *I medeltidens Stockholm*, 85–89.

them away from the populated areas as well. The discussions of individual industries will include a more thorough analysis of the role of place in the environmental regulations.

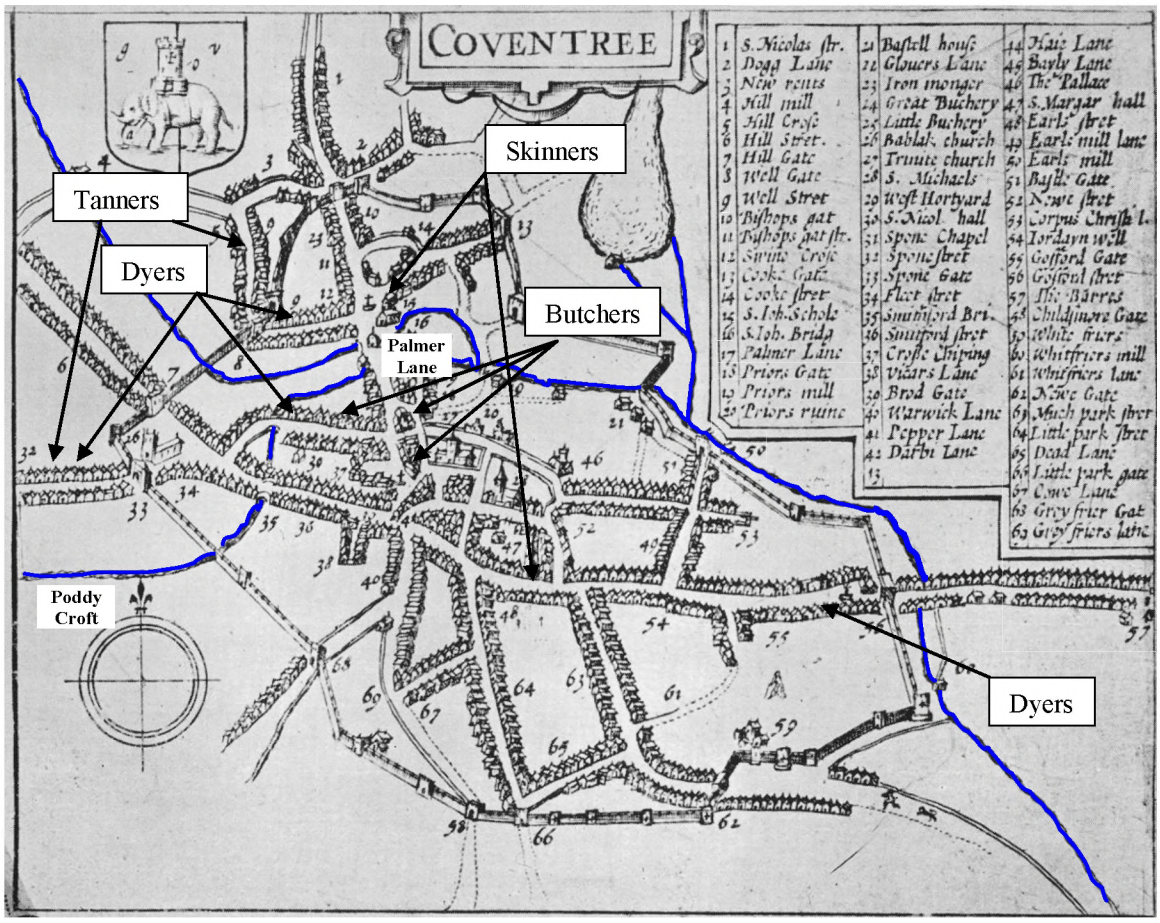


Figure 5-1. Coventry map showing industry locations. Major watercourses indicated by darker lines. Other sites mentioned in the text also labeled. Based on locations listed in "The City of Coventry: Crafts and industries: Medieval industry and trade," Table 2. The base map is John Speed, *The Theatre of the Empire of Great Britaine*, Map of Coventree, 1611.

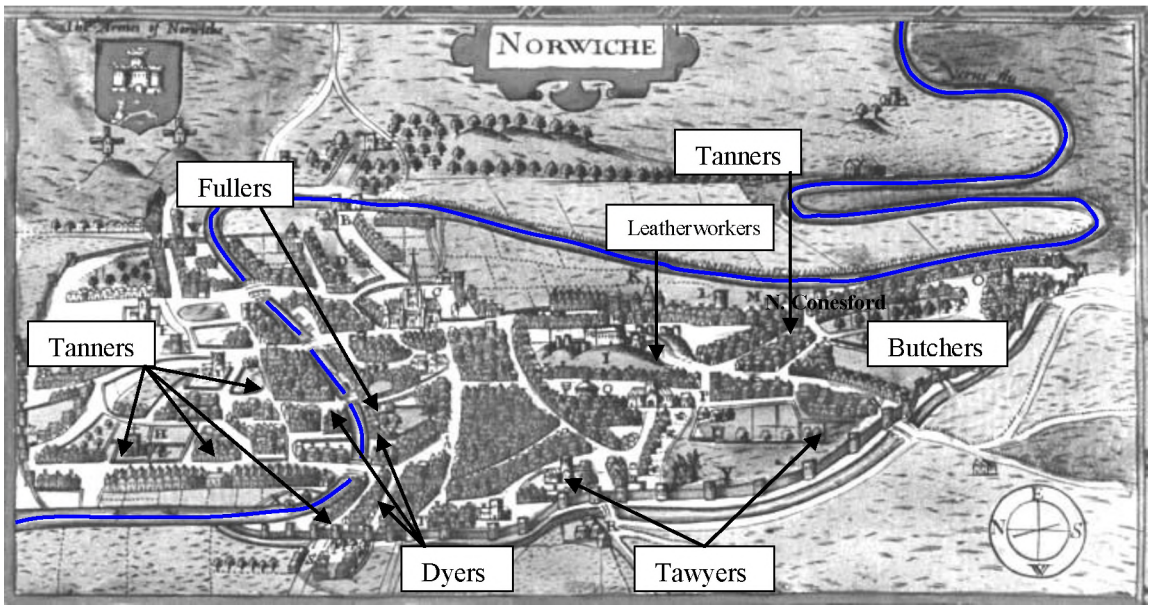


Figure 5-2. Norwich map showing industry locations. Major watercourses indicated by darker lines. Industry locations from Rawcliff and Wilson, *Medieval Norwich*, Map 9. The base map is John Speed, *The Theatre of the Empire of Great Britaine*, Map of Norwich, 1611.

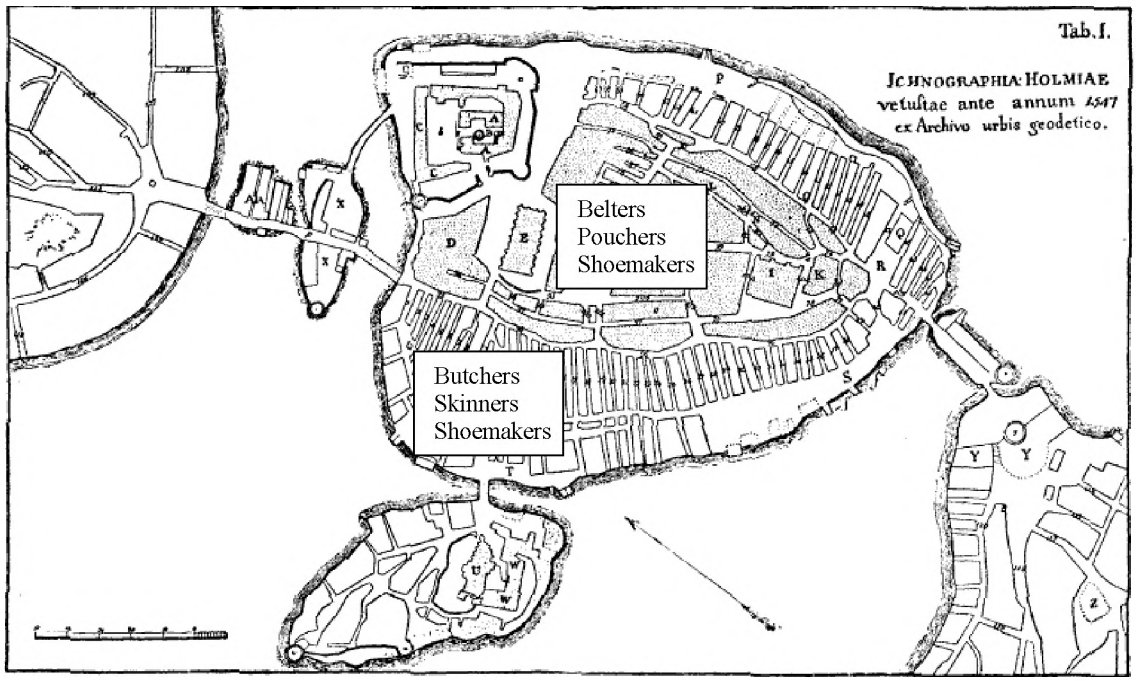


Figure 5-3. Stockholm map showing industry locations. The butchers and skinners were confined to their small quarter in the far northwest of the island. Locations based on Dahlbäck, p. 92. The base map is from *Nordisk familjebok*, ed. Th. Westrin, vol. 26 (Stockholm: Nordisk familjeboks, 1917), 1496-97; digitized version available at http://runeberg.org/nfcf/0818.html.

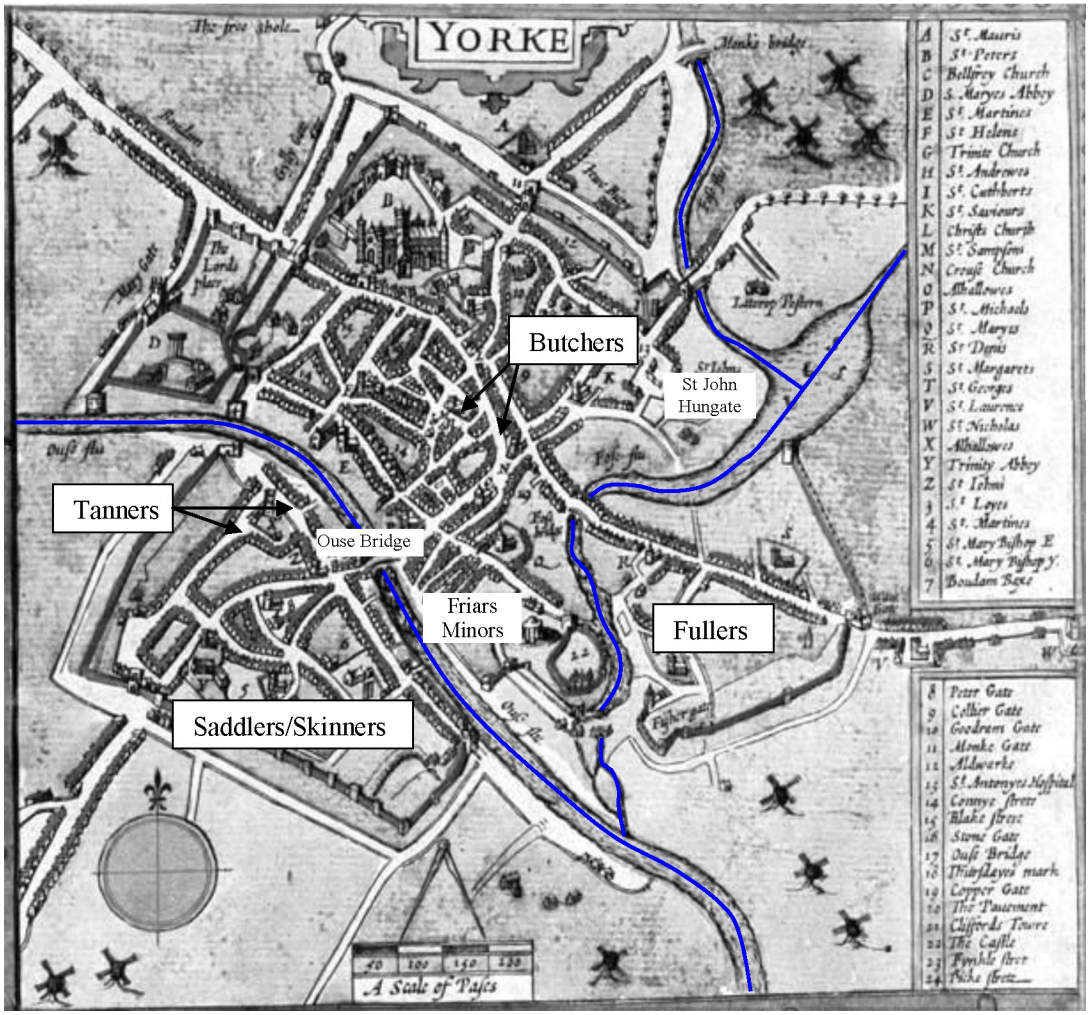


Figure 5-4. York map showing industry locations. Other industries were more dispersed throughout town. Major watercourses indicated by darker lines. Other sites mentioned in the text also labeled. Based on industry locations discussed in P. M. Tillott, *A History of the County of Yorkshire: the City of York* (London: Victoria County History, 1961), 84-91. The base map is John Speed, *The Theatre of the Empire of Great Britaine*, Map of Yorke, 1611.

The regulation of product quality is well-known to medieval historians. Cities actively monitored the freshness of meats and fish and the quality of goods such as cloth sold in the marketplace. Guilds managed the outputs of their individual members to maintain the industry standards. Guild regulations, which were approved and enacted by

city authorities, covered the quality of input materials, the types of permitted processing, final goods standards, and labor organization. Cities monitored the production of food and drink to ensure the health and well-being of residents. Butchers, for example, were often condemned for selling rotten meat.[8] But in addition to these market-focused economic measures, cities also regulated businesses with an eye on their outputs to the environment.

We saw in Chapters 3 and 4 that city governments took an active interest in regulating urban waste disposal, particularly controlling the location of latrines and disposal of animal manure. In this chapter, we will see that cities also worked to limit the environmental impact of businesses. The physical nature of businesses directly affected the daily activities and roles of the medieval city councils. In order to understand why the councils thought of these businesses as environmental problems, we must first examine the operations involved in each craft process. Then, we can examine the measures that various city councils took to regulate the activities.

## *Textile Manufacturing and Water Pollution*

The technology of medieval textile manufacturing involved heavy use of water, which during the course of the processing steps, became contaminated with oils, fibers, and bacteria. Textile manufacturers in northern Europe primarily worked with wool or linen (made from flax or hemp). Wool was prepared by carding (the use of a board with teeth

[8] See for example the discussion of guilds in Tillott, *City of York*, 91–97 and Stephens, *City of Coventry and Borough of Warwick*, , 157–62.

to separate the fibers), spinning, weaving, and then fulling. In the fulling process, the wool cloth was trampled underfoot while submerged in water. The fuller added clay, known as fullers' earth, to the water to remove the wool oils and speed the matting process. Cloth was fulled in a tub of water or directly in a water body. The processing of flax and hemp included removing the seeds and soaking the steams in water (called "retting") to soften the fiber by bacterial action. After the stems were washed and dried, they were beaten and scraped to remove the outside fibers. After being woven, the linen cloth was washed again and then bleached in the sun.[9]

Cloth preparation thus resulted in the release of oils, seeds, stems, and loose fibers to the water. In addition, the process of retting created foul smelling and noxious effluent.[10] The city councils acted to control this source of water pollution. Because of Coventry's significant cloth working industry, retting in the River Sherbourne appears to have been such a problem that in 1554, the council ordered that no one water any hemp or flax in the river.[11] They also banned the washing of cloth from looms at the drinking water conduit because this would have caused contamination of the drinking water

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[9] Description of cloth working processes from Penelope Walton, "Textiles" in *English Medieval Industries*, ed. John Blair and Nigel Ramsay (London: Hambledon and London, 1991), 319–54.

[10] This is because the bacterial concentrations lowered the dissolved oxygen content in the water, creating a situation similar to a stagnant pool where algae grow. There has been some archeological work into water contamination, or lack thereof, associated with retting. Mark Robinson found that flax retting in Saxon times did not cause significant water pollution in the Rivers Nene and Thames. However, he notes that these are larger water bodies with significant flow and smaller channels would have been more severely affected by retting. See Mark Robinson, "Saxon flax retting in river channels and the apparent lack of water pollution," in *The Environmental Archaeology of Industry*, ed. Peter Murphy and Patricia E. J. Wiltshire (Oxford: Oxbow Books, 2003), 141–42.

[11] *Coventry Leet Book*, pt. 3, 810–11.

source.[12] According to the York Civic Ordinances of 1301, canvas and linen were not permitted in the gutters.[13] In Norwich, a complaint against the Dutch and Walloon textile workers charged that they were cleaning their wool-processing equipment on the banks of the river to "the greate infeccion of the same." In addition, the workers combed wool in their open shops and poured out the wash water from their shop floors into the gutters. Because the water contained combing fibers and the workers did not pour supplemental clean water into the gutter to wash the residue downstream, it "reasteth in the gutters and breadethe greate infeccions..." The Norwich council responded by banning the washing of wool equipment at the river and ordered that wool combing must not take place near the street. In addition they required the wool workers to throw out scouring water only at night and to cast additional clean water after it so that the wool particles and contaminated water would "passe to the cockeyes under the grownde withoute the hurte of anye parson."[14] This case demonstrates that common business practices in the textile industry required city council intervention. Water pollution from cloth working was clearly identified and even linked directly to disease. Although the flax and wool cloth processing activities had economic benefits for the city, the councils were not willing to sacrifice city sanitation to support the cloth industry.

Although the cloth working itself had environmental consequences, the most visible and harmful effects came from dyeing. Dyers could add color at any stage in the

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[12] *Coventry Leet Book*, pt. 2, 338.
[13] Prestwich, *York Civic Ordinances, 1301*, 17.
[14] *Records of the City of Norwich*, vol. 2, 335–37.

process from raw material to finished cloth. Dyers primarily relied on cultivated plants, such as madder for red and woad for blue, to make their dyes. In order to fix most dyes to the cloth, the fiber had to be first dipped in a mordant, typically ferrous sulphate or alum. Woad required the addition of an alkali substance such as potash to make the dye soluble. The dye bath was typically heated in a cauldron and the cloth dipped into it.[15] The dyeing liquors were both caustic, because of the additives, and odoriferous, making work with them unpleasant. A drawing in the fifteenth century Italian silk dyer's manual *Trattato dell'Arte della Seta* even shows a dyer pinching his nose while stirring a hot pot of red dye.[16]

A significant water supply was necessary in the dyeing processes, leading most dyers to choose a location next to a stream or river. Excavations in Norwich uncovered a fifteenth century complete dyer's workshop on the banks of the River Wensum, including furnaces, hearths, a water storage pit and a drain to take effluent to the river.[17] The water also needed to be relatively clean in order to avoid the introduction of impurities that could adversely affect the dyes, leading many dyers to position their businesses near the river's entrance into the city. Evidence from Norwich indicates that most of the city's dyers located their shops along the River Wensum northwest (and upstream) of the city center as shown in Figure 5-2. The street names in this section of town reveal the heavy

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[15] Description of dyeing processes from Walton, "Textiles."
[16] The image is in the manuscript Plut. 89 sup. Cod. 117, Biblioteca Laurenziana which has been printed as a facsimile: *Trattato dell'arte della seta in Firenze*, vol. 1 (Florence: Cassa di risparmio di Firenze, 1980).
[17] Brian Ayers, "Craft Industry in Norwich from the 12th to the 18th century," in *Lübecker Kolloquium zur Stadtarchäologie im Hanseraum V: Das Handwerk*, ed. Manfred Gläser (Lübeck: Schmidt-Römhild, 2006), 32.

emphasis on cloth production: Shearing Cross, Fullers' Hole, Maddermarket, etc. One group of dyers operated on a small tributary of the Wensum in the west section of town and the fullers were located near the most central dyers on the river. Coventry's dyers also located their shops near the river on the two far ends of town (Figure 5-1). The dyers' water supply came via wooden channels ("waterlades") from the river and tributary brooks, but this posed a problem because the channels blocked the watercourse and thus increased the threat of flooding. The council ordered dyers to remove their waterlades unless the mayor and the council granted an easement for the channel. The cost of the easement was 12d. annually. Even the permitted waterlades had to be drawn up every night in order to avoid the "perell of ffloodes fallyng in nyghttyme."[18]

Cloth processing generated solid and liquid refuse (cinders, paste, alkaline water, grease, etc.) which required disposal. Dyers appear to have often disposed of corrosive waste dye liquids from the dye-vats and cinders from the heating operations in the river. According to archeological finds in Bristol, England, dyers apparently dumped madder and weld at the wharf in fourteenth century.[19] Because the dyers' shops were located upstream of the city center in order to procure clean river water for their process, any wastes they subsequently ejected into the water would make its way into town downstream. The dyes likely discolored the water, at least locally where the material was dumped. The visible signs of pollution (color and particulate matter in the water) as well as effects on the taste of the water may have concerned residents and the councilmen.

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[18] *Coventry Leet Book*, pt. 1, 28 and 31–32.
[19] Walton, "Textiles," 337.

Cities attempted to deal with this issue by regulating dyer waste disposal. The regulations treated solid textile production waste in a fashion similar to the organic wastes examined Chapters 3 and 4. For example, in 1421, Coventry's mayor commanded that no dyer put fat or filth in river.[20] This order in the Mayor's Proclamation came just after restrictions on sweeping the streets during rains to get rid of waste, throwing filth in the Sherbourne, and waste disposal in the Red Ditch. It was, then, simply one of several components of Coventry's environmental laws.

We also know that similar laws were enforced in Norwich. Just as the government levied fines for dung disposal in the river or discarding filth in the street, the Norwich leet court fined three dyers in 1390–91 for inappropriate disposal of craft wastes. First, they fined John Wake 20s. for throwing cinders, paste, and other dyer wastes into the river. Second, they found John Long guilty of placing muck, cinders and other refuse by the stakes on the banks of the river. Third, the court fined another dyer, John Lymmes, 2s. for disposing of muck and paste in the road under the wall of St. Martin's churchyard.[21] The entries in the Norwich court records indicate that the city treated the disposal dyer craft waste similarly to other solid wastes. When dyers threw these solid (cinders) and semi-solid (paste) wastes from the dyeing process into the river or streets, the city fined them. Because we have specific names and amounts of the fines, we know that the city at least sometimes enforced regulations against improper waste disposal by dyers.

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[20] *Coventry Leet Book*, pt. 1, 32.
[21] *Leet Jurisdiction in the City of Norwich*, 70, 73, 75. In the first case, the court specifically identified these wastes as being from his craft, "de arte sua."

In Nottingham, it appears that the biggest problem was the dumping of liquid and semi-liquid wastes from the dye vats into the streets and gutters. In the court records of Nottingham for 1395, a jury found that all the dyers of the city (and they specifically named the seven worst culprits) "stifle the common people with the stench from the residues of their waters dropping and falling on the King's highway, etc." The jury said that dye waters caused "corruption of the whole people passing."[22] In 1407, the same jury found Robert Chesterfield guilty of injuring "the neighbors with dye-water."[23] Robert had been one of the offending dyers named in 1395, indicating that although he had been previously warned and fined for ejecting dye water into the street, he continued the practice. Robert likely did not modify his behavior because of both the real need to get rid of the water somewhere and the convenience of the street gutters. The other offenders named in 1395 do not show up again, meaning that they either found alternate disposal methods (possibly discharging the dye water directly into the river instead of the street) or were not caught disobeying the law. These jury records again demonstrate that the city levied fines for sanitary infractions when violators could be identified, but it also indicates that in spite of these attempts at keeping a clean city, some dyers commonly disobeyed restrictions in order to get rid of their wastes. The cities, then, faced a constant struggle to regulate environmentally-damaging businesses.

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[22] *Records of the Borough of Nottingham,* vol. 1, Roll of Presentments of the Mickletorn Jury, 275 and 273. The entry on page 273 was a general finding of fault with all dyers for "ejection of the waters of their art." This finding was actually stricken from the roll because of the later entry that named specific individuals.
[23] *Records of the Borough of Nottingham*, vol. 2, Roll of Presentments of the Mickletorn Jury, 41. Later Nottingham collected a 4d. fine from the dyer John Hawys for disposing of water in the street in 1512: *Records of the Borough of Nottingham*, vol. 3, 339.

## *Leather Industries and Noxious Tanning Liquors*

The second group of craftsmen that the city governments considered environmental hazards worked with hides. Leather, the preserved hides of animals, was one of the primary materials for medieval clothing, animal harnesses, and military equipment. In order to make animal hides durable, leather creation included numerous chemical and biological processes, most of which generate noxious by-products. Tanners acquired hides with the horns and hooves attached from butchers. The first step was to clean the hides of blood, dung, and salt left over from the butchering process. The tanner then allowed the hairs on the skin to rot, sometimes assisted by sprinkling the hair side with urine or soaking the skins in lime in order to loosen the hairs for removal. After the hairs were removed, the tanner treated the skins to make them flexible. This was done either through alkaline bating, which involved immersion in bird guano or dog dung, or acidic drenching, which required treatment in fermenting barley or rye. After all this preparatory work, the hides could actually be tanned in tanning liquor typically made from oak bark. Hides often stayed in the tanning liquor for a year before removal and final washing. The tawyer followed a similar process of preparing hides except that instead of using oak bark, the tawyer treated the skins with a paste of alum and oil.[24] As this description reveals, tanning and tawying were extremely foul-smelling processes that required hazardous strong acidic or basic liquors. The fluids included ingredients such as lime,

[24] Description of tannery process from John Cherry, "Leather" in *English Medieval Industries*, ed. John Blair and Nigel Ramsay (London: Hambledon and London, 1991), 295–318.

dung, urine, and one-year-old soaked oak bark. No wonder tanning was considered an environmental danger.

As the above description illustrates, the tanning process required significant amounts of water and generates highly noxious effluent. For this reason, most tanneries were located on a river or stream, although some may have used well water. Just as in the case of dyers, tanners needed clean incoming water to create their tanning liquors and wash skins. In the processing steps, wastewater contaminated with blood, flesh pieces, lime, and tannins would require disposal and this would all flow downstream. The medieval residents could sense the physical contamination – the water stank, it tasted strange, and discarded flesh and fat floated on top of the water. Some city governments found that they needed to control these industrial pollutants because of downstream uses of the water, particularly in food preparation.

A study of the property owners in fourteenth century Norwich shows that tanners operated on several of the river tributaries (cockeys) upstream of the town center, mainly on the opposite side of the river (Figure 5-2).[25] By being located across the river, the tanners minimized the nuisance created by smells from the tanning process, but their location upstream of town also meant that all wastewater would flow right through the central urban area. The location of this main group of Norwich tanneries made their by-products and impact on the river visible to the city inhabitants. There were two other groups of tanners located on cockeys downstream of the urban center, so these would not

[25] Tannery locations from diagram in Rutledge, "Economic Life," 162.

have caused such obvious problems. In 1561, a complaint came before the Norwich council about lime at the washing place in Nether Connesford. It appears that someone had put lime at the washing place, making it impossible for residents to wash clothes there because the caustic nature of the lime harmed the fabrics. The council responded by levying a fine of 20s. on anyone putting lime at the washing place.[26] Although we cannot be certain, it may have been lime from the tanning process that caused this uproar. There was a group of tanners located in the Nether Connesford ward and lime is a common additive in the tanning process. It appears that the government of Norwich also recognized that left-over carcasses from the skinning process posed a certain health hazard: the Norwich Leet fined William the Skinner "because he has thrown the dead bodies of cats into the pit of Lothmere whereby the air is poisoned."[27]

In Coventry, tanning operations took place on the west side of town just outside of the walls. Two groups of tanners have been identified in the records as shown in Figure 5-1: one on Well Street near Radford Brook (the tributary entering the Sherbourne from the north) and the other on Spon Street near the Sherbourne River. The Coventry tanners, like in Norwich, were located upstream of the city center in order to get clean water for their process. It appears that some skinners used water from the town's drinking water supply system instead of the river. According to a property lease of 1564, four skinners leased four washing houses, called "the Skyners houses," and obtained

[26] *Records of the City of Norwich*, vol. 2, 135.
[27] *Leet Jurisdiction in the City of Norwich*, 29. Original in Latin.

permission to use water supplied via the town conduit system for washing skins.[28] There are no occurrences of tanners being cited specifically for improper waste disposal, so they do not appear to have posed problems for the city council.

In York, however, the city council issued legislation aimed at tanners several times. York's map (Figure 5-4) reveals the same pattern as Norwich and Coventry – tanners located their shops upstream of the city center, in this case on the Ouse River near its entrance into the town. The placement of the tanners in this part of town is also attested by the name of the street Tanners Row and the fact that the tanners' guild leased a large piece of land (called "Le Mote") in the area.[29] Washing skins directly in the river from these locations was convenient for tanners, but this activity was expressly forbidden by the council because of contamination of food. The York council barred the washing of skins between the Friars Minor's (Franscicans) property and a pier nearby where butchers washed entrails, as well as any place on either side of the Ouse where water was drawn for brewing or baking.[30] The Franscican friary was located downstream of the Ouse Bridge after the third lane leading down to the river on the city side. The King's staith, which was a primary ship cargo unloading area, took up most of the river shoreline between the friary and the Bridge. The butchers washed the entrails there, as it was the closest access to clean water from the butchery area – it is a straight shot down Pavement Street then Coopergate then King's Street from the Shambles (see Figure 5-4). This area

[28] Coventry City Archives, BA/C/12/1/4, 24 February 1564.
[29] *York House Books*, vol. 1, 31–33.
[30] *York Memorandum Book,* pt.1, 15.

was known as The Pudding Holes and served as a public washing place downstream of the Ouse Bridge where, among other things, the entrails of beasts used to make black pudding were cleaned (thus the source of the name Pudding Holes). Therefore, it was important to keep water at Pudding Holes clean.[31] York's council stated that tanners were not to lie, cast, or wash limed skins or leather in the water above Pudding Holes because of "corrupcion of the water of Ouse."[32] The problem with this mandate was that the tanners had deliberately located themselves upstream of the Ouse Bridge in order to obtain clean water. By forcing them to be downstream of Pudding Holes, they would have to be located downstream of the city center. It is interesting to note, however, that saddlers and skinners appeared to have already been located downstream of the bridge. These restrictions clearly demonstrate that the York council recognized that washing leather contaminated the water, making it unfit for use in food or drink prepartion. The council sought to render the water safe for consumption through its control of the leather-working industry.

Norway's city councils also controlled tanning. The Bergen city restricted the location of tanners as early as the late thirteenth century. The Urban Code of 1276 specified where each industrial group would be located along High Street.[33] The

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[31] Raine, *Mediaeval York*, 224–25. York's council also required fish cleaning to take place downstream of Pudding Holes rather than above it in 1580 and forbade the disposal of dung and filth at the location. Interestingly, Coventry had a quite different problem with washing entrails for pudding. In that case, butchers had been washing entrails in the conduit water reserved for drinking. The council outlawed the practice and set a 40d. fine for violators. (*Coventry Leet Book*, pt. 1, 208)

[32] *York Memorandum Book*, pt. 2, 247.

[33] See discussions of the Urban Law in Knut Høiaas and Bård Gram Økland, *Med lov skal byen brygges: Magnus Lagabøtes bylov av 1276* [The city shall be built by law: Magnus Lagabøte's city law of 1276]

shoemakers, who performed all tannning functions in Bergen, were located the furthest away from the settlement. Their placement put them in Vågsboten, at the far end of Vågen bay. The city law of 1282 made it illegal for the cobblers to throw bark from their tanning process into the stream Hugaå which led to the bay.[34] Yet, archeological finds confirm that the cobblers dumped large amounts of scrap leather in Vågsboten.[35] The shoemakers' environmental effect is nicely summarized in a letter from Bergen's citizens to the king in 1623:

> "Humbly we have to complain about the great uncleanliness, poisonous evil stench and smell from the shoemaker's work, in particular their tannery on one of the best and distinguished lots here in town by the cathedral, which leads weak people to great sickness.... [The people] desiring that the tannery and glue balls and bark balls must be abolished and moved to another convenient place outside of town, be it ordained and moved."[36]

In response, the shoemakers were relocated to Lille Lungegårdvann, further from the main part of town.

The Oslo council barred shoemakers, feltmakers, and skinners from washing and rinsing skins in the rivers of town in 1595.[37] The two rivers named in the law (Alna and

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(Bergen: Bryggen Museum, 2001), 6 and Ingvild Øye, "Crafts in Bergen from the 12th to the 18th century," in Gläser, *Lübecker Kolloquium V Das Handwerk*, 613–15.

[34] Bergen's city law of 16 September 1282 in *Norsk middelalder dokumenter*, 175.

[35] Økland and Høiaas, *Bare boss*, 19.

[36] Translated from a quoted passage in Økland and Høiaas, *Bare boss*, 29.

[37] "Forordning i 12 artikler for Oslo, 6. mai 1595," ed. Tore Hermundsson Vigerust, http://www.vigerust.net/oslo/oslo1595_forordning.html. The original text is found in Riksarkivet, Manuskriptsamlingen no. 19, dated 1618.

Klosterelva) were Oslo's two most important sources of washing and drinking water.[38] It is, thus, obvious that the council was attempting to control pollution of these water sources.

Stockholm's case was a bit different because the medieval city was located on an island. Most of the shoemakers (who performed tanning operations in the city), butchers, and skinners worked in the western quadrant of the island (Figure 5-3). They lived close to each other and shared a common commodity – animal skins.[39] This location gave them access to water, which they would not have had as easily in the middle section of the island. Only one fine of a saddlemaker for illegal dumping of "uncleanliness" (orenlighet) was found in the Stockholm tänkeböcker examined in this study.[40] It appears, therefore, that the island setting allowed tanners to operate without serious environmental effects on other residents.

Parchment-makers posed the same environmental problems as tanners. The parchmenter first thoroughly washed skins bought from a butcher and, following the same practice as tanners, let the hide rot so that the hair could be removed. But instead of tanning the hide, the parchmenter stretched the skin over a frame and allowed it to dry. He then vigorously scraped the hide, generating a pile of shavings, to create parchment often as thin as tissue paper. The parchment-maker's process thus created dirty

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[38] Torstenson, *Fra nattmann til renholdverk*, 23.
[39] Dalhbäck, *I medeltidens Stockholm* , 94.
[40] *Stockholm Tänkeböcker 1514–1520*, 34.

washwater, hair, and fleshy scrapings which required disposal.[41] Because these wastes are quite similar to the tanners, it is easy to see why the Norwich council identified parchmenters along with tanners as river polluters.

The Norwich identification of troublesome trades also included two leather-working trades: glovers and saddlers. These trades could also create water pollution. Glovers and saddlers molded leather supplied by tanners. In order to work the leather into objects such as armour and saddles, the material was soaked in cold water until thoroughly saturated. This made the leather plastic, allowing it to be molded and decorated by stamping or punching. After completing the ornamentation of the leather surface, the leatherworker often decorated the object with stain, dyes or tempera paint.[42] The guild ordinances of Worchester, England issued in 1467 specifically restricted the leather-dressing activities of saddlers and glovers in the local river. The workers were required to shave skins above the bridge over the Severn between the bridge and a watering place at Saint Celements gate and wash skins downstream of the bridge on the bank opposite of the main city or at the dock. They were not to cast animal waste into the river.[43] The craftsmen in these trades clearly shaved and washed leather, generating scrap

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[41] Christopher de Hamel, *Scribes and Illuminators* (Toronto: Univeristy of Toronto Press, 1992), 8–12
[42] Cherry, "Leather," 304
[43] *English gilds: the original ordinances of more than one hundred early English gilds: together with The olde Usages of the cite of Wynchestre; the Ordinances of Worcester; the Office of the Mayor of Bristol; and the Costomary of the Manor of Tettenhall-Regis: from manuscripts of the fourteenth and fifteenth centuries*, ed. Joshua Toulmin Smith (London: Published for the Early English Text Society by the Oxford University Press, 1870), section LI. The ordinance also applied to butchers and bakers. It is interesting to note that tanners are not listed, so the saddlers and glovers may have been performing some or all of the tanning processes as well as working the leather into final goods.

flesh and contaminated water, and therefore, these activities needed to be limited to certain areas of the water course.

Overall, this analysis reveals that tanning businesses posed a paradoxical problem for city officials concerned about the environment. Tanning operations required significant amounts of relatively clean water to produce well-tanned leather. This meant that tanners preferred to locate upstream of the city center. Yet the process also generated noxious wastewaters which required disposal. Since contaminated water (whether generated in tanning vats or by direct contact with skins washed in the river) would have to enter the main watercourse, city officials wanted this activity downstream of other industries requiring clean water, particularly the food services, as seen in the case of York. There was thus a clear tension between the industrial needs and the urban sanitary condition.

## *Brewers and the Need for Water*

Brewers are the final environmentally-damaging group identified in the Norwich statement. Brewing generated some semi-solid wastes. After the fermentation process, impurities and unprocessed vegetable matter remained in the beer. In order to collect this matter, medieval brewers hung bags filled with items that would attract the residue, including oxen and pigs' feet, fish membranes, and oak bark. In addition, the brewer could filter the beer to remove the dregs. Straw often served as the filter and became

impregnated with yeast.[44] These collection materials required disposal and it is possible that the Norwich reference to brewers as environmental problems refers to their waste disposal practices. Unfortunately, none of the city council records in this study have any specific entries dealing with pollution from brewers. This would lead us to believe that it was not a common problem.

Coventry, however, did regulate brewers' use of drinking water. Coventry inhabitants obtained drinking water from underground sources because the local surface water was not potable.[45] In the Middle Ages, Coventry had an extensive network of water conduits to distribute well water. The city invested significant funds in the conduits and intended the water for personal use. In 1444, the Coventry council issued the first restriction against industrial use of the conduits in the records, stipulating that brewers could not use the water for brewing, but only to prepare food. The mayor and the warden split a fine of 40d. (3s. 2d.) assessed on violators.[46] The ban on brewers was reissued several times over a span of 100 years and the fine was eventually raised to 20s. beginning in 1497.[47] Brewers wanted to use the water to steep the barley, but this was not allowed without a special license. In 1493, the council made a list of all brewers permitted to use conduit water for brewing and steeping because they paid annually to the conduit repair fund. Each of them paid a fee of 6s. 8d., which had been mandated in

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[44] Richard Unger, *Beer in the Middle Ages and the Renaissance* (Philadelphia: University of Pennsylvania Press, 2004), 151–52.
[45] Herbert Lapworth, "City of Coventry, Report on Water Supply," 12 November 1925, presented to the Chairman and Members of the Waterworks Committee of the Council of the City of Coventry, City of Coventry Archives.
[46] *Coventry Leet Book*, pt. 1, 208
[47] *Coventry Leet Book*, pt. 1, 232, 255; pt. 2, 338, 517; pt. 3, 584, 788, 808–9, 812.

1483. Two persons paid double the normal rate (13s. 4d.), which might mean that they used twice as much water as normal brewers.[48] However, the council did permit brewers and malters to use conduit water for the dressing of mead according to a 1450 proclamation.[49] Coventry's restrictions on use of conduit water in the brewing process shows again that business and larger borough needs required balancing. The city had invested significant amounts to supply the population with drinking water and although brewers required water for making beer, their needs were not prioritized as highly as drinking water.

## *Butchery By-products*

According to frequency of appearance in the city records, butchery was the most regulated occupation in terms of waste disposal. Butchery was messy business, leaving behind blood and entrails. The councils dealt with two main problems: the location of slaughterhouses and animal pens and the location of butchery waste disposal. In their responses to these environmental issues, we see that the councils clearly recognized the sanitation problems at hand and issued appropriate regulations accordingly.

First, the cities attempted to control where butchers slew their animals. The most obvious remedy was to forbid butchery within the walls of the city, but this was not as easy to do as it sounds. Ernest Sabine has traced the complex political, social, and economic twists and turns of regulating the London butcheries of St. Nicholas Shambles.

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[48] *Coventry Leet Book*, pt. 2, 548–49.
[49] *Coventry Leet Book*, pt. 1, 255. Reiterated in 1497 (pt. 3, 584).

The affair included nuisance complaints against the butchers, their forced relocation, new complaints, a subsequent increase in meat prices, and a later additional relocation.[50]

Coventry faced similar problems. In 1421, the mayor outlawed the slaughter of all livestock except swine within the city walls and pig slaughter had to take place at the common scalding house.[51] Yet the council soon faced problems. At the October 1422 meeting, the council noted that they had previously prohibited killing animals within the city walls, but it had not been a satisfactory arrangement, so they decided to allow butchers to kill cattle, calves, and sheep in their own houses and pigs at the common slaughterhouse for the current year. The butchers were not permitted to slaughter animals in the street or tie up animals outside. The council specifically ordered each butcher to "kepe his durre clene fro bloode and other fylthis."[52] The reason for this change of heart is not recorded, but Coventry may have faced resistance from the butchers or price increases similar to the London case. Although the council permitted butchery within the walls, they still tried to maintain minimum levels of sanitation by forbidding slaughter in the streets and requiring cleanliness. The following year they ordained that butchers were not permitted to raise pigs in sties or in their houses.[53] So although the butchers could slaughter the pigs in town, pigs could not live within the urban space. In 1447, the council reiterated that all butchers were to scald animals only at the slaughterhouse in

[50] Sabine, "Butchering."
[51] *Coventry Leet Book*, pt. 1, 32.
[52] *Coventry Leet Book*, pt. 1, 42–43.
[53] *Coventry Leet Book*, pt. 1, 58.

Palmers Lane.[54] Coventry was not alone in forbidding street slaughter. According to the financial rolls, York fined three butchers in 1475 for slaughtering animals in the street contrary to city ordinances.[55] By controlling where butchery activities took place, the councils tried to maintain a more sanitary urban environment.

Second, the councils tried to ensure proper butchery waste handling. Butchered animal carcasses required disposal, and records of fines indicate that irregular disposal of carcasses was not permitted. The Aberdeen council, for example, ordered the butchers to remove carcasses from the slaughterhouse every Friday.[56] The Norwich Leet fined Stephen the Carter 2s. because he threw putrid ox-flesh on the land of Matthew Brown in 1288/9.[57] The Nottingham Mickletorn Jury also presented the butcher John de Blythe for blocking up Saint James Lane with blood, entrails, and issues, to the serious detriment of all the people passing by.[58] These citations indicate that councils tried to enforce proper waste disposal by butchers.

In Coventry we also find that the council frowned upon improper butchery waste handling. Some persons lodging at the Coventry priory complained to the king in 1380 that "certain evildoers" had thrown animal wastes into the river Sherbourne repeatedly, thus corrupting the water that flowed into the priory mill and "infecting the air." The king

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[54] *Coventry Leet Book*, pt. 1, 232. The scalding house in Palmers Lane was located on the Sherbourne River next to a latrine according to two land leases: Coventry City Archives, BA/C/4/3/1 dated 1 Dec 1448 and BA/C/4/3/2 dated 25 Dec 1465. The second lease allowed the butchers access to draw water at the scalding house.
[55] *York City Chamberlains' Account Rolls 1396–1500*, 145–46.
[56] *Extracts from the Council Register of the Burgh of Aberdeen 1398–1570* (Aberdeen: Spalding Club, 1844), 11.
[57] *Leet Jurisdiction in the City of Norwich*, 28.
[58] *Nottingham Records*, vol. 1, 279.

responded by issuing a commission of inquiry into the complaint. The results of the inquiry are not known. The list of wastes ("bones, hides, and offal of oxen, swine, and sheep") in the complaint indicates that the likely perpetrators were butchers and tanners.[59] We know that the disposal of butchery waste appears twice in later records. In 1452, Coventry mandated that butchers only deposit entrails in the "assigned" place and in 1474, the driver of the butcher's cart was ordered to throw the entrails and other waste into the middle of the pit at Poddycroft and not on the sides. The council even banned butchers from taking hogs to the pit to consume the slaughter leftovers, presumably for health reasons.[60] The Coventry council's actions show that the government took steps to designate allowable waste disposal locations in addition to banning illicit practices.

An extended sequence of events in York tells us that controlling butchers was not an easy task. In 1371, the York council prohibited butchers from casting refuse or offal from slaughtered beasts between the Ouse Bridge and the little wharf near the Friars Minor. The butchers' guild was ordered to make a pier upon the said small wharf downstream of the Friars, presumably for washing their entrails.[61] It appears that the council's action came in response to complaints from the Friars Minor, because when the 1371 command failed to deter the butchers' waste disposal practices, the friars appealed to the king.

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[59] *Calendar of the Patent Rolls preserved in the Public Record Office, Richard II, vol. 1, 1377–1381* (London: Public Record Office, 1895), 4 Richard II, part I, 579.
[60] *Coventry Leet Book*, pt. 2, 271–72, 389.
[61] *York Memorandum Book*, pt. 1, 15.

King Edward III sent a letter to the mayor and bailiffs of the city on 10 May 1372 in response to the Friars' complaint. The friars claimed that the butchers had recently started throwing waste near their walls and gates as well as into the River Ouse near the monastery. According to the letter, there were dire physical consequences of the waste disposal practices: "the air in their church is poisoned by the stench there generated as well around the altars where the Lord's body is daily ministered as in other their houses, and flies and other vermin are thereby bred and enter their church and houses." The result was that the good people of the city and country who used to go to the friars' church to hear mass and pray "are withdrawing themselves because of the stench and the horrible sights." The friars' also feared that "sickness and manifold other harm" would arise if the king did not order a change in the practices. In response, the king commanded the city officials to issue a order to the butchers of the city that they should only dispose of offal, blood, dung, and ordure "in the places where they used to be laid and cast of old time" or the city should appoint a new disposal place where the waste could be "covered up." The king set a fine of 100s. on any butcher laying waste within 200 feet of the Friars' monastery.[62] The Friars had appealed to the king as the ultimate authority in England for relief and the king took it as his Christian duty to respond. Yet, the letter placed the burden of ordering the butchers to follow the rules on the mayor and city bailiffs, which indicates that the king saw sanitation as the city government's responsibility.

[62] *Close Rolls, Edward III, vol. 13,* 438.

The city authorities had to respond to the king's request. The records do not include an immediate proclamation in response, but five years later in 1377, we know that the mayor and council passed a law saying that if any butcher or his servant threw offal or refuse on the Ouse Bridge, into the River Ouse, into the streets of the city or elsewhere except "in the place assigned to them by the mayor of the said city," the butcher would be fined 6d. and forfeit the vessel in which the perpetrator had carried the waste. [63]

Apparently, the butchers did not abide by this ruling because in 1380, the Friars Minors again complained about the situation to the king. The king issued a grant in favor of the Friars stating that it was illegal for butchers to throw offal or filth into the river or lanes near the convent. The king mandated that the butchers take their waste to a distant place according to the previous order of York's mayor and bailiffs.[64] Now we see that the king himself ordered the butchers to obey the council's rules.

The orders from the king and city had specified that butchers were not to throw waste in the river and near the Friars' monastery and required disposal in approved distant places. But even if the butchers stopped throwing waste in the river and near the monastery, did they consistently take it to the approved location? The evidence suggests that the butchers simply relocated their urban waste disposal to another area of town. In 1409 Thomas Haxey, Canon-residentiary, heard complaints from parishioners of St. John

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[63] *York Memorandum Book*, pt. 1, 17–18. The medieval french orginal says "la place as eaux assignex depar le mair".
[64] *Patent Rolls*, *Richard II, vol.* 1, 524.

Baptist Hungate that the butchers of the Shambles were dumping offal near the southern churchyard wall. The parishioners were disgusted by the waste as well as the unclean birds and dogs that flocked to the spot causing "such a vile smell that only with difficulty did the priest manage to get through the service." Bones were scatted about the churchyard, and the roof of the church had been damaged. In 1411 a complaint was made again about the offal heap.[65] St. John Hungate was located in an area known as "The Marsh" in swampy terrain near the River Foss. This site is even closer to the Shambles than the River Ouse, so it would have made a convenient waste dump after disposal in the Ouse was forbidden. The land was also fairly vacant in the Middle Ages because of its waterlogged nature; the lack of nearby residents would have made it a highly attractive landfill site to the butchers. Yet, the butchers' actions clearly adversely affected the church parishioners. No action by the York council to stop disposal in the Hungate area is recorded. In fact, in 1524, the council indentified Hungate as the appropriate disposal location for all residents of Walmegate ward.[66]

York obviously faced an ongoing problem with butchery waste, because in 1421, when the council approved a 90-year lease of a property on the bank of the Ouse to the ironmonger John Preston, the lease contained the restriction that Preston was not to sublease the land to any butcher for the disposal of entrails and was to keep the property free from filth causing foul smells or he would face expulsion.[67] Seven years later, the

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[65] Raine, *Mediaeval York*, 83.
[66] *York Civic Records*, vol. 3, 96.
[67] *York Memorandum Book (B/Y)*, 58.

council told butchers to take their entrails to a particular spot on the Ouse River where men of the local villages could come with their boats to pick up the "dung, filthy nuisances, fluids and intestines to cultivate and prepare their land."[68] York's dealings with the urban butchers reveals the difficulty of controlling trades. Although York had made early attempts to restrict disposal of butchery waste in the Ouse, it continued to be a problem. The council was forced to establish waste disposal practices that included mandatory reuse of butchery wastes as fertilizer. This step appears to have been successful because the issue does not come before the council again within this study period.[69]

## *Cities and the Smell of Money*

This chapter has demonstrated the active involvement of medieval city governments in regulating environmental consequences associated with urban businesses. In spite of the economic importance of the textile and leather industries, the councils expressed concerns about water contamination associated with them. To combat detrimental practices, the councils issued legislation specifying where cloth and leather processing could take place and where they were forbidden. Enforcing these restrictions was not an easy task. At least in the case of Norwich dyers, the court records show that the authorities levied (and collected) fines for illegal waste dumping. But as the case of the

[68] *York Memorandum Book*, pt. 2, 70.
[69] York's ban on river disposal is quite different from the disposal requirements in London where butchers were instructed to take entrails to the Thames at ebb-tide for disposal (Sabine, "Butchering," 340). It appears that Winchester butchers also practiced legal river disposal (Keene, "Medieval Environment in Documentary Records," 138).

tanners of York reveals, multiple user groups wanted access to the same environmental resource – clean water – and this resulted in conflict. The York council favored the butchers' right to clean food over the tanners' right to wash skins in the Ouse, but this does not mean that butchers could run amok. In fact, butchery was a highly regulated activity in terms of where and how animals were slaughtered and where waste was taken. The councils designated acceptable locations to dispose of entrails and proper handling procedures. Because of concerns about the safety of food and supply of water, councils ordered the cleaning of marketplaces and restricted industrial use of drinking water supplies. The control of businesses was a large piece of the urban sanitation programs of these cities.

As the industry descriptions reveal, the physical environmental damage of many medieval industries was highly visible and odoriferous. The most regulated businesses – dyers, skinners, tanners, and butchers – had these two traits in common. They all generated large quantities of pungent waste products, whether liquid or solid, that required disposal either directly into water bodies or on the land. It is interesting to note that the laws discussed do not deal with metalworking or smithing. This is not because these trades were not odoriferous – in fact, they generated large quantities of smoke – but it appears that much of the large-scale metalworking had already been moved out to the urban edges before the fourteenth century because of its incompatibility with housing

areas.[70] The government's concern with the remaining urban wastes is consistent with their policies on latrine contents and animal dung, which also have strong odors. Chapter 2 proposed that the importance of smell in defining dirt. The findings from this chapter appear to confirm that smell was a primary motivator for environmental control of business. Visibility and odor, then, were key factors in late medieval urban environmental law.

Although the trades controlled – cloth manufacturing, leather processing, and butchery – were vital to the city economy, the city governments clearly believed it was in the interest of the public to regulate their practices. Controlling obstructions and disease-inducing smells was vital to the public welfare and the larger economic picture, as we saw in chapter 2. In light of these concerns, the council members believed that one of their duties was to ensure a clean, orderly city. We see the manifestation of this belief in the regulation of business practices to improve city environmental conditions.

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[70] Malcolm Atkin and Alan Carter, "General Introduction," in *Excavations in Norwich: 1971–78*, part 2, East Anglian Archaeology Report, No. 26, ed. Malcolm Atkin, Alan Carter and D. H. Evans (Norwich: Norwich Survey, 1985), 3. They include the text of an insightful poem dated to c.1350 about the air and noise pollution from smithing in Norwich.

# 6

# Supplying Sanitation Services

In 1557, Stockholm implemented a complex street cleaning program. First, the city council decided that two people would be hired as waste inspectors. They were to ensure that waste, particularly cartloads of dung, was not thrown into the street gutters or the harbor. Violators were subject to a half mark fine. Illegally dumped waste had be removed and taken to the council-designated disposal site. In addition, the council enlisted the help of residents to clean the streets in a bi-weekly program. The cleaning operation began with the householder living furthest up the hill from the sea who would begin by sweeping the street and rinsing it with one barrel of water when the town clock struck. Then, as the runoff reached the next neighbor down the street, the neighbor was to rinse the street in front of his house with another barrel of water. This proceeded down toward the harbor so that by the end, all of the accumulated dirt and filth was washed into the harbor. This cleansing operation was slated for every other week. Anyone failing to comply with the bi-weekly cleaning was fined one mark for the first two times, three marks for the third, and the fine would double each successive violation. The fine was split between the reporter of the violation (one-third) and the city (two-thirds).[1]

Stockholm's cleaning program demonstrates the complex nature of providing sanitation services in the late medieval city. The city hired workers, but it also relied on

[1] *Privilegier, resolutioner och förordningar för Sveriges städer*, vol. 2, 352.

active resident participation. We saw in the previous three chapters that the city governments attempted to regulate the handling and disposal of organic waste and business by-products. Some of the services provided by the city, such as dung carts, have already been mentioned. But this chapter delves deeper into the nature of sanitation management in order to see how solutions to sanitation issues were constructed as a relationship between the city government and urban inhabitants. Although the councils oversaw the urban streets and rivers, they made individuals directly responsible for environmental upkeep. Because they did not institute large-scale public works departments such as those founded in nineteenth century, the governments had to rely to some extent on the public to provide labor for projects. Medieval sanitation required upon both public maintenance of technology and cooperation from private individuals.

This chapter examines the ways in which late medieval city governments attempted to manage their city environments by incorporating residents into governmental services through cases involving street maintenance and waterway cleanliness. Through an analysis of these actions and reactions, the chapter will explore how city governments as well as private citizens became involved in providing sanitation services in the medieval city.

## *An Environmental System*

Streets and water acted as an interconnected environmental system in the late medieval city. Streets carried runoff, both rainwater and waste strewn in the street, into ditches and

eventually the river or harbor. Because of the necessity of water for commerce, travel and consumption, medieval cities of any size had to be situated on water, as noted in Chapter 2. For the English cities, this was a river: Coventry had the River Sherbourne, Norwich the River Wensum, and York the River Ouse. The Scandinavian cities were harbor towns with a bay: Bergen was located on the Vågen and Stockholm was surrounded by water and had several harbors including Kornhamn and Kogghamn. Together, the streets and water bodies provided drainage for the urban space, thus, what happened upstream in the streets directly affected the downstream water quality.

The interconnectedness of streets and water was recognized in the Middle Ages. The Coventry city council stated explicitly that sweeping the street gutters to clear filth away while it was raining would "pester the Ryver with fylthe & muck." They recognized that individuals purposefully swept waste into the street in order "to convey the dunge or Mucke therof into the seid River."[2] According to the Norwich council, filth entered the river by way of "cockeys, gutters and other meanes" and "euermore suffered to augment and encrease more and more, the whiche in shorte is like utterly to decaye the same river."[3] Some people threw waste into the streets and it remained there "untill by rage of water the same is wasshed into the comon dreynes and cockeys, and so into the ryver of the same cittie to the great annoyance of the saide cocyes and ryvers."[4] Through these statements we see that the city councils recognized the ties between street gutters,

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[2] *Coventry Leet Book*, pt. 3, 804 and 720–21.
[3] *Records of the City of Norwich*, vol. 2, 115–16.
[4] *Records of the City of Norwich*, vol. 2, 141.

ditches, and urban rivers. When analyzing the ways that city councils attempted to control the urban streets and water bodies, we are looking at a holistic environmental system at work.

## *Medieval Street Technology*

Although it may be imagined that medieval streets were muddy tracks through town, paving of streets by the late medieval period was not uncommon. Numerous archeological finds in the urban areas of England and Scandinavia attest to this.[5] Considering the economic importance of commerce in urban centers, the need to make roads that were passable at all times of year and in all weather conditions should not be surprising. But in addition to their role in trade, streets were an integral part of the medieval sanitation system because street gutters facilitated urban drainage of both rainwater and liquid wastes. Paving aided the drainage function of the streets. If city

[5] In spite of the volume of evidence on the subject, broad scholarly works generally do not discuss paving practices. Because many reference works fail to discuss paving, its value as part of the urban sanitation system can be overlooked. For example, John Schofield and Alan Vince in their general treatment of medieval urban archeology, *Medieval Towns: The Archeology of British Towns in their European Setting*, 2nd ed. (London: Continuum, 2003), say that there has been little excavation of streets and include only one investigation in Winchester where flint surfaces were found. They then go on to quote a statement from Derek Keene about streets being ankle-deep in refuse (66). In Singer et al.'s *A History of Technology*, ancient street systems including those from Mesopotamian and Roman are described in detail as examples of the concern for traffic and hygiene. After this section, follows the statement: "In the Middle Ages conditions were certainly worse, though our information on this point is unfortunately scanty" (531). Although Singer includes evidence for the presence and maintenance of paved streets in the late medieval period, the tone of the three pages devoted to the subject implies inadequacy, as indicated in the conclusion of the chapter: "It took many centuries to restore conditions to the level of the better conducted cities of antiquity" (533). On the other hand, David Nicholas in his textbook *The Later Medieval City: 1300–1500* (London: Longman, 1997) rightly states that most cities began paving major streets in the thirteenth century and cobblestone was common by the fourteenth century. He observes that maintenance of roads, bridges, canals, and conduits became major line-item expenses in later medieval city budgets. He bases these statements on evidence from France and Italy (334).

residents disposed of solid wastes in urban streets, gutters would become clogged and fail to serve their drainage purpose. Therefore, the city governments found it imperative to regulate how streets were used. The scale of investments (both in money and in public authority) in paving streets shows the power of medieval councils to shape the urban environment and their willingness to act on conceptions of the common good as described in Chapter 2.

Archeological evidence shows that street paving came in three basic varieties: wooden planking, gravel surfaces, and laid stone. The various types of surfaces are shown in Figure 6-1. Wooden planking appears to have been preferred as the earliest type of paving near harbors in Scandinavia. Wooden paving was most appropriate in wharf areas because it could be installed on piles driven into sand instead of requiring a relatively flat surface to rest upon like stone pavement. In Bergen's wharf district, part of the planked surface of a public thoroughfare in Bugården has been dated to immediately after the city fire of 1332. Its widest measurable point was 3.6 m wide. In another Bergen tenement area, Engelgården, the tenement passage from the 1300s has survived almost the full length of the site. It was paved with transverse boards and had a drain down the center. The drain appeared to have been covered separately by wooden planks.[6] Excavations in Ribe, Denmark, revealed wooden streets from the beginning of the thirteenth to the fifteenth century, especially in the old riverfront area. They were constructed with posts driven into the soil and glacial sand with beams lying on top at

[6] Asbjørn E. Herteig, *The buildings at Bryggen: Their topographical and chronological development*, The Bryggen Papers, no. 3, pt. 1 (Bergen: Norwegian University Press, 1990), 58, 75.

street level then planks placed on top of the beams.[7] Finds of wooden planked streets in Oslo also date to the thirteenth century.[8]

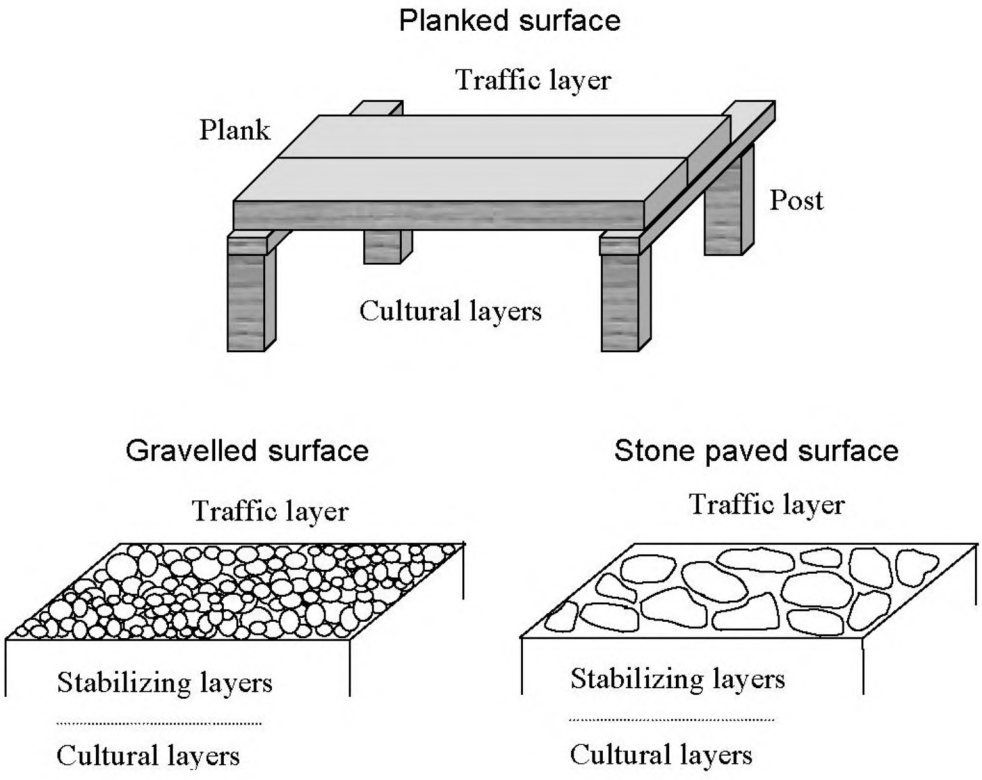


Figure 6-1. Typical late medieval paved street designs. Drawing by author. Designs from Hans Skov, "The Infrastructure in Århus between 900 and 1600 AD," 562.

Gravel, or metalled, surfaces sometimes replaced the wooden surfaces in Scandinavia; in England, they are often the earliest surviving type of pavement. For example, in Bergen's Søstergården, the traditional log surface of The Old Church Road,

[7] Kieffer-Olsen, "The Infrastructure of Ribe," 545.
[8] Petter B. Molaug, "The Infrastructure of Oslo from the 11th to 17th century," in Gläser, *Lübecker Kolloquium IV Die Infrastruktur*, 507.

which was burnt in a fire in 1476, was covered by a new surface of sand and gravel.[9] The earliest archeological evidence for metalling of streets in Norwich has been dated to thirteenth century in the Friary precinct. In this case gravel used for first surface and then was later replaced by flint rubble.[10]

The final type of street paving was a regular stone surface. This type of urban street became increasingly more common in the fourteenth through sixteenth centuries. Stone surfaces were commonly laid over earlier wooden or metalled streets. Although regular stone surfaces required more maintenance, they also wore better under heavy traffic. On the Bugården public thoroughfare which had been planked in wood sometime around 1332, the surface appears to have been repaved in stone by 1400. The excavated stone-paved surface extended 7 to 8 meters along with a drain covering a distance of about 11 meters. The stone paving consisted of relatively flat, untrimmed stones laid next to one another to create a relatively continuous surface.[11] In Ribe, stone paved streets with a gutter in the middle typically succeeded the wooden ones in the fourteenth century.[12] Oslo digs show that major roads were paved, such as Vestre street which was provided with a paving of stone slabs from the fourteenth century, and had a width of approximately 5 meters. Beginning in the sixteenth century, cobblestones were also used

[9] Herteig, *Buildings at Bryggen*, pt. 1, 98.
[10] Brian Ayers, "The Infrastructure of Norwich from the 12th to 17th centuries," in Gläser, *Lübecker Kolloquium IV Die Infrastruktur*, 37. Cowgate's thirteenth and fourteenth century surface was also gravel.
[11] Herteig, *Buildings at Bryggen*, pt. 1, 58.
[12] Kieffer-Olsen, "The Infrastructure of Ribe," 545.

for paving in Oslo.[13] Uppsala appears to have used cobblestone streets from about 1170 and never used wooden planking. Almost all of the urban streets appear to have been cobbled beginning in the fourteenth century. In addition, crushed limestone pavement has been dated to about 1500.[14] The physical evidence indicates that by the late medieval period, many streets within urban centers were covered with regular stone pavement.

Cobblestone surfaces appear on both large and small streets. In *A History of Technology and Invention*, Maurice Daumas states that because paving with large stones was expensive, it was "adopted only for streets that carried heavy traffic."[15] Daumas, who used evidence from Paris, is contradicted by archeological finds in England and Scandinavia. York finds indicate that even small streets were paved: a twelfth century lane was surfaced with cobbles and the alleyways at the 16-22 Coopergate investigation from around 1300 were paved with cobbles and/or limestone rubble.[16] Uppsala's paved streets included both small and large passageways as well.[17] The widespread existence of paved streets demonstrates that city residents were generally concerned with road conditions.

Paved streets with gutters managed the flow of rainwater, keeping streets passable to aid in commerce and making the city habitable. Gutters are discussed in numerous written sources, although the text rarely includes information about street physical

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[13] Molaug, "The Infrastructure of Oslo," 507.
[14] Johan Anund, "Interaction, Convention and Regulation Infrastructures in Medieval Uppsala," in Gläser, *Lübecker Kolloquium IV Die Infrastruktur*, 440–441.
[15] Daumas, *History of Technology & Invention*, vol. 2, 508.
[16] Richard A. Hall, "York's Medieval Infrastructure," in Gläser, *Lübecker Kolloquium IV Die Infrastruktur*, 80.
[17] Anund, "Interaction, Convention and Regulation Infrastructures in Medieval Uppsala," 440–41.

properties or layout. One exception is an entry in the York Civic Records which said that the pavement upon the Ouse Bridge was to be newly made "and the chanell set in the myddward of the same."[18] This description of a gutter running down the middle of the street is confirmed by archeological evidence. For example, an excavated stone-paved street in Bergen was equipped with a gutter constructed with slender, roughly square stakes approximately 1.5 meters long laid in a V-shape (see Figure 6-2). The top of the gutter measured 0.7 to 1 meter wide with the bottom measuring 0.5 – 0.6 meters wide. The sides of the gutter were stabilized with gravel fill.[19] Excavations in Roskilde, Denmark show that the gutter stones were laid in either a V or U configuration. There appears to have been no preference for one or the other layout, as both have been found even on the same street.[20] In Uppsala, Sweden street gutters were particularly necessary to drain away rainwater because of the heavy clay soil. Drainage gutters have been found across streets, along property boundaries, as well as in the center of the street.[21] The ubiquity of streets outfitted with gutters indicates that the inhabitants recognized and valued the streets' function as a drainage way.

The late medieval street paving and guttering techniques described above were not particularly complicated technologies to put into place, but they did require planning so that gutters would be properly positioned and maintained so that pavement did not rapidly disintegrate.

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[18] York Civic Records, vol. 2, 171.
[19] Herteig, *Buildings at Bryggen*, pt. 1, 34.
[20] Koch, "Middelalderens gader," 249.
[21] Anund, "Interaction, Convention and Regulation Infrastructures in Medieval Uppsala," 441.

Figure 6-2. A stake-lined gutter adjacent to a stone-paved street from Bergen's wharf area. The street and gutter configuration has been dated to the mid-1300s. Courtesy of Medieval collection, Bergen University Museum. Image number BRM-0181.

## *Maintaining Paved Streets*

Cities typically maintained paved streets by distributing the burden to residents. The councils mandated that residents and shop owners maintain the pavement directly in front of their houses and shops. In the city council records, these orders typically came with a calendar deadline and a fine to be levied for noncompliance. For example, the Coventry council in 1423 ordered all tenement holders to repair the pavement in front of their houses before the next leet, which was to be held in six months. The fine for violators was set at 3s. 4d.[22] Then in 1495, the council gave the common sergeant explicit permission to repair any pavements not properly maintained and to charge the responsible party for the full cost of the repairs in addition to a set fine.[23] In 1550, the York council required all inhabitants to repave in front of their doors as often as necessary to maintain a sufficient street surface.[24] Norwich specified that every owner of every dwelling had to level the street with sand or stone pavement up to the middle of the street.[25] Danish sources contain similar mandates to householders. In 1400s, the Roskilde city laws included the obligation to contribute to general city infrastructure (bridges, roads and walls), as well as maintain the individual pavement in front of one's own house. The 1531 Aalborg city law specified that citizens maintain the street with stone paving for the whole width and length of the street as their land and house occupies. In one Aalborg

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[22] *Coventry Leet Book*, pt. 1, 58. Coventry also issued orders to repair pavement in particular parts of town: Much Park Street in 1448, the Trinity Guild grounds in 1507, and area between Saint Francis Gate and Chellesmore Gate in 1532 (pt. 1, 233; pt. 3, 607, 712).
[23] *Coventry Leet Book*, pt. 2, 568–69.
[24] *York Civic Records,* vol. 5, 30.
[25] *Records of the City of Norwich*, vol. 2, 96–98.

document, the city council stated that when the property under consideration was rented, the obligation to clean the street remained with the owner and the text stipulated that the owner must provide maintenance up to the middle of the street.[26] The responsibility to pave the street in front of each door was thus set up similarly to a property tax – property owners or tenants had to contribute financially to maintain the streets.

Were these council mandates followed? In the standard encyclopedic *A History of Technology*, the authors state that "though in theory road-maintenance was an obligation of the landowners the obligation was little regarded."[27] Physical evidence, however, confirms the allocation of pavement maintenance to urban householders in several Scandinavian archeological investigations. Many of Oslo's wooden planked streets show differences in the pattern of the planking corresponding to different house plots even though the overall quality was similar. These differences probably indicate the shifting responsibility of street maintenance from one tenement to the next both laterally down the street and across the center line of the street.[28] In Trondheim, a boundary was visible in several cases where the house owners' cleaning and maintenance of the alley had ceased. In Uppsala, fifteenth century streets show that central line of the street marked and the boundaries of the plots were extended to the middle line of the street with the aid of larger stones, thus every householder was allocated a marked rectangle which he was

[26] Koch, "Middelalderens gader," 284–86.
[27] Singer et al., *History of Technology,* vol. 2, 524.
[28] Molaug, "The Infrastructure of Oslo," 507.

obliged to keep clean (Figure 6-3).[29] The physical demarcation of the street indicates that the city and responsible parties wanted to clearly identify who was responsible for maintenance of each section, thus making it easier to identify lax individuals as well as setting the boundaries of obligation.

Figure 6-3. Road paving in Uppsala, Sweden using larger stones to demarcate individual householder responsibility for pavement. Courtesy of National Heritage Board of Sweden.

[29] Anund, "Interaction, Convention and Regulation Infrastructures in Medieval Uppsala," 441–42.

Even though the cities demanded the individual participation of residents in maintaining the street pavement, they did not necessarily think that every individual would physically install new pavement. The Coventry council did not expect residents to do the paving work themselves, but rather to pay for the services of professional pavers. In 1442 the council ordered that the mayor provide street pavers whose wages would be paid by collecting money from all holders of free tenements.[30] An entry from 1474 recognized pavers as an occupation and required that they install only quality pavement: "euery pavyer that paveth within the Cite that he made goode & sufficient pavyng, vppon the peyn to pave hit newe at his owne charge."[31] In York, professional paver services were regularly used to maintain pavement on the Foss and Ouse Bridges.[32] The Bridgemaster paid for these services out of the bridge tax revenues. In addition, the Bridgemaster accounts note other places in town where the city paid for paving services, including streets and marketplaces.[33] The professionalization of paving services indicates both the high demand for adequate paving and the willingness to pay for these services.

Norwich also depended on citizen involvement for street upkeep. In 1467, Norwich implemented a program to rework the city street system. By a set day in May, each individual was to have swept up and removed all of the waste in the street in front of their home or shop. Then the street was to be leveled with sand or pavement by June. The

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[30] *Coventry Leet Book*, pt. 1, 199.
[31] *Coventry Leet Book*, pt. 2, 389. The Paviors of London were organized as a City company at about the same time, in 1479 (Singer et al., *History of Technology,* vol. 2, 533).
[32] *York Bridgemaster Accounts*, 63, 98, 110, 439.
[33] These locations included Walmegate Bar, the end of Colliergate and the end of Saint Saviour's way, Hosiergate and Nesgate (*York Bridgemaster Accounts*, 439) and the marketplace "called the Pavement" (*York Civic Records*, vol. 2, 171).

leveling was to take into account the "ancient water drain" which would funnel runoff to the great gutters or directly to the river. The drain was not to be raised or filled with sand or paving stones. Work supervisors were appointed by the aldermen of the wards to oversee the work. The council established fines for anyone not complying with the street leveling program.[34] It is unknown if the work was actually carried out, but since complaints about non-compliance do not appear, we can assume that the program was successful at the time.

Yet it appears that relying on residents to provide street paving had its downsides. Nearly one hundred years later in 1559, the situation had changed for the worse and the council enacted "An Actte for the Pavyng of Stretes." In the Act, they first acknowledged the long-standing tradition of paving the city streets that had been "a great ease and helthefull commodyte." The council may have been referring to earlier projects such as the repaving of 1467 with this statement. The Act noted that recently, however, "the great gredynes and obstynacy" of men had caused the streets to decay and the pavement broken to the "discommodyte and annoyaunce of the neybours and travaylors." Maintenance of pavement was completely lacking in places where pavement had been previously properly kept up. So the council required that all persons having a house or land adjoining any common street of the city repair the pavement in front of their property using stone, as was "the use and custome of the cittie" within 3 months of the Act. For every yard of street not properly paved with stones, the responsible party would pay a

[34] *Records of the City of Norwich*, vol. 2, 96–98.

fine of 6d.[35] This Act tells us that by the mid-sixteenth century, Norwich had many paved stone streets and the council was directly interested in their maintenance because some individuals had been lax with upkeep. We do not know, however, if the Act was efficacious in bringing about a change in the street maintenance patterns.

This Act reveals one of the challenges with making individuals responsible for a public good: if one individual chose not to maintain a street section, the whole street suffered. The late medieval governments had two choices: either impose fines to force residents to do their share or collect taxes and handle the paving as a civic service. What we see in the cases above is that both tactics were employed simultaneously. Street paving was thus both a civic and individual responsibility.

## *Keeping Streets Clean*

As the previous section demonstrated, street gutters within the city were put in place to move water away from the houses to the river as efficiently as possible. An early record from York shows that the medieval residents understood the value of street drainage: a building permit was granted on the condition that the new owners allow the water to descend from the street of Fiskergate to the Ouse because "the course of the water ought to be by the said lane."[36] Yet, streets also became a convenient waste disposal location for some residents. Some residents tried to pile up waste in front of their houses, shops,

[35] *Records of the City of Norwich*, vol. 2, 133–34. The Act even included a provision for those unable to pay their fine within 14 days to have their fine arbitrated by a group of five or six men chosen by the mayor to hear the specific details of the situation.
[36] *Yorkshire Inquisitions*, vol. 2, ed. William Brown (York: The Yorkshire Archaeological and Topographical Association, 1898), 119. Original text in Latin.

or stables in the street, but this caused two problems. The first problem was that the waste could directly hinder commerce. A complaint made to the local court in the Norwich records of 1287 stated that Richard de Aylsham and Ralph Muddok and Matilda Hodys had blocked the king's highway with muck-heaps so that carts could not pass there without hindrance.[37] The second problem was that when it rained, the waste would wash away down to the river along with the rainwater. Residents often swept waste into the gutters with specific intention of moving it on to the river.[38] As the water velocity slowed down in the river bed, the waste would then settle out in the river. Over time, the accumulation of waste and dirt could seriously affect the river's carrying capacity.

To counter the use of street gutter as disposal location, councils issued prohibitions against the practice. Councils passed legislation forbidding raking and sweeping of waste into the streets, particularly when it was raining.[39] The Coventry council even specified that fishmongers and cutters had to clean up all fish guts and other garbage thrown into the street by four o'clock in the afternoon the same day it was cast there.[40] The city laws of Magnus Erikkson fined those who threw waste into the street or onto another person's property 6 øre.[41] These prohibitions, and the others discussed in

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[37] *Leet Jurisdiction in the City of Norwich*, 7.
[38] In 1524, the Coventry council ordered that noone was to "swepe the streit to convey the dunge or Mucke therof into the seid River" which indicates the intentionality of the residents' actions. (*Coventry Leet Book*, pt. 3, 720–21). An entry in the York records from 1371 also said that when it was raining many citizens threw dung out into the street, presumably for the same reason (*York Memorandum Book*, pt. 1, 14).
[39] For example, *Coventry Leet Book*, pt. 1, 29–30; *York Memorandum Book*, pt. 1, 14; *Coventry Leet Book*, pt. 1, 208; *Coventry Leet Book*, pt. 2, 418.
[40] *Coventry Leet Book*, pt. 2, 555
[41] *Magnus Erikssons Stadslag i Nusvensk Tolkning*, 88–89.

Chapters 3 and 4, reveal a significant legislative framework for banning waste disposal in the streets.

Yet the councils also mandated street cleaning. They required that householders and shop owners clean the streets in front of their doors, typically on a weekly basis. Street cleaning activities are well documented for both the English and Scandinavian cities. In Coventry, the 1421 Mayor's Proclamation required every man to clean the street in front of his place every Saturday or pay a 12d. fine with no exceptions.[42] In York, the officers of the ward had to inspect the streets of both the city and suburbs to ensure that they were "clenely kepid and wekely sweped."[43] The council reiterated this requirement in 1550 and added that inhabitants were responsible for cleaning and sweeping any part of a street in front of their dwelling twice each week. In 1552, the council specified that the cleaning was to take place every Saturday and Tuesday.[44] The general city laws of Scandinavia included street cleaning requirements. Magnus Eriksson, for example, required each person to clean his street or face a 3 øre fine[45] and citizens in Danish cities according to a 1548 law were required to clean the streets every Saturday and to maintain good stone pavement on them.[46] Stockholm's city council records indicate that the council was continually interested in maintaining clean streets. In 1479, they ordered

[42] *Coventry Leet Book*, pt. 1, 30.
[43] *York House Books 1461–1490, Volume I*, 353–54.
[44] *York Civic Records*, vol. 5, 30 and 82.
[45] *Magnus Erikssons Stadslag i Nusvensk Tolkning*, 88–89.
[46] *Privilegier, resolutioner och förordningar för Sveriges städer*, vol. 2, 568.

Jacob the tailor to keep both sides of the street clean in front of his building.[47] Ten years later, they ordered a general workday to clean up filth in the neighborhood streets before it could runoff into the harbor, and agreed that proper waste disposal locations east and west of the city should be identified and used in the future.[48] Through these relatively simple laws, urban residents became responsible for street cleaning on a regular weekly basis.

Besides legal restrictions on waste disposal in the streets, the city councils turned to practical methods of maintaining a clean city. They often employed regular street cleaners. In Norwich, two persons were appointed in each ward to clean the streets.[49] In Coventry, a door tax of 1d. per quarter paid for street cleaning services.[50] The Stockholm council records have several entries dealing with paid street cleaners. Stockholm appointed Pedher Hansson in 1481 to clean up all areas in front of the bridge and on the seashore. He was paid with an annual salary as well as clothing.[51] The next year, the council authorized a one-time payment of 12 marks to a carrier to "carry off the uncleanliness which they have laid illegally."[52] In 1486, they made another one-time appointment of carriers to take away filth that had accumulated in pits in front of the cross at Sudre Malm.[53] In 1494, Engelbrecth was offered 6 marks to carry away the

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[47] *Stockholms Stads Tänkeböcker 1474–1483 samt Burspråk*, 211.
[48] *Stockholms Stads Tänkeböcker 1483–1492*, 328.
[49] *Records of the City of Norwich*, vol. 1, 288.
[50] *Coventry Leet Book*, pt. 2, 273.
[51] *Stockholms Stads Tänkeböcker 1474–1483 samt Burspråk*, 319.
[52] *Stockholms Stads Tänkeböcker 1474–1483 samt Burspråk*, 333.
[53] *Stockholms Stads Tänkeböcker 1483–1492*, 131.

uncleanliness in the city.[54] These services demanded financial support from the urban inhabitants and management by the city council.

Some cities provided for regular city-run waste cart services. In York, the council mandated that a dung cart be placed in every ward,[55] and in Norwich, the council provided two weekly muck carts to serve nine parishes.[56] In Coventry, the carter services appear several times in the record. First, the council appointed William Oteley as the weekly street cleaner and waste remover in 1420.[57] Then in 1452, every person who owned a shop was reminded of their requirement to pay the 1d. tax.[58] In 1470, the council ordered a cart to clear away muck accumulated in Much Park Street and designated a 1d. door-tax for it;[59] and in 1493 the constable of each ward had to ensure that the weekly cart service was provided.[60] According to a 1497 entry, the cart came by to pick up wastes, particularly dung, on Saturday. On Sunday afternoon and Monday, the common sergeant and town crier would walk through town to ensure compliance and fine any violators 2d.[61] The provision of weekly waste removal services reveals a commitment by the city officials to maintain clean streets and city order. The government required residents to pay a tax to cover these services and made city officials responsible for providing the service.

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[54] *Stockholms Stads Tänkeböcker 1492–1500*, 153.
[55] *York Civic Records,* vol. 2, 165.
[56] *Records of the City of Norwich*, vol. 2, 110.
[57] *Coventry Leet Book*, pt. 1, 21.
[58] *Coventry Leet Book*, pt. 2, 273.
[59] *Coventry Leet Book*, pt. 2, 361.
[60] *Coventry Leet Book*, pt. 2, 552–53.
[61] *Coventry Leet Book*, pt. 3, 586–87.

In Scandinavia, barrels and waste bins appear in several cities beginning in the 1200s. Putting waste into barrels at the point of generation allowed the waste to be moved easily to another location. Residents placed barrels in the ground or at the corner of the house or in the courtyard. In both cases, it would appear that householders took the barrel contents for final disposal offsite and the archeological material that remains is from the final time the barrel was filled. The use of barrels for household waste accumulation makes sense when seen alongside the provision of carter services. Barrels would have made it easy to empty out the contents into the passing collection cart.[62]

Keeping the streets free of waste was a responsibility split between individual inhabitants and the government. Restrictions on behavior helped alleviate improper waste disposal, but the councils also turned to regular street cleaners and waste disposal services to help keep the city clean.

## *Managing the Waterways*

In addition to managing the streets, the city councils worked to ensure clean and unobstructed waterways. Waste accumulated in the rivers and ditches of the urban environment both through street runoff and direct dumping. The river was likely seen as a good option for waste removal by some residents because the water would theoretically remove the waste from the inhabited area. But other uses of the river – rainwater drainage, flood control, fishing, travel, commerce, drinking water, craft use – all

[62] Jörpeland, "Den grå vardagen," 67, 70; Anund, "Interaction, Convention and Regulation Infrastructures in Medieval Uppsala," 449.

conflicted with the river's use as a waste disposal location. The governments responded with both legislative action and practical cleanup operations, directly involving the citizenry.

The councils explicitly voiced their concerns about blockage of waterways by accumulated waste. According to the Coventry council, the River Sherbourne had been "stoppyd of his course" by "filthe, dong, and stonys" causing "dyuers perels…by floodys." [63] In 1467, Norwich councilmen complained that their river was "greatly filled with dirt, so that at divers times of the year, dry ground is observed in certain places…and the flow of water is prevented."[64] Weed overgrowth of the river was a habitual problem in Norwich, and filth in the river was seen as a leading cause.[65]

So in addition to bans on putting waste in the streets discussed in the previous section, the governments issued prohibitions against the direct disposal of waste in their water bodies. In the Bergen city privileges of 1284, King Eirik Magnusson declared that no one should carry household waste or muck out to the wharf.[66] King Håkon Magnusson forbade the disposal of household waste, bark, or stones in the Nidelven of Trondheim in 1313.[67] The Stockholm tänkeböcker include several prohibitions against throwing waste

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[63] *Coventry Leet Book*, pt. 1, 31. The prior of the monastery complained in 1480 that waste was stopping up the floodgates and channels of the monastery's mill causing it to not run (pt. 2, 445).
[64] *Records of the City of Norwich*, vol. 2, 96.
[65] *Records of the City of Norwich*, vol. 2, 115.
[66] *Regesta Norvegica: kronologisk fortegnelse over dokumenter vedkommende Norge, Nordmænd og den norske Kirkeprovins*, 7 vols. (Christiania: 1898-1997), vol. 2, 126.
[67] *Regesta Norvegica*, vol. 3, 265.

into the harbor.[68] The books recorded fines to various individuals for waste disposal in the water and even noted how much of the fine was paid at the time of the council meeting.[69] Other entries in the Stockholm records also indicate that fines were collected, such as an order in 1518 for Kort Rut to come to terms with the tax collector because his people had thrown out waste in the city streets and a case against Gregers the carpenter who had thrown a hammer into the back (!) of a city tax collector when the city servant came to his house to collect a fine for throwing waste into the harbor.[70] These examples demonstrate that fines actually were collected for dumping waste into the urban waterbodies.

The councils of Coventry, York and Norwich combined legislative activities with organized river maintenance. Each of these examples reveals the extent to which city governments became involved in river upkeep and how individuals were directly coopted into the process.

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[68] The Stockholm Burspråk, or law-speaking, of 1459, 1462, 1463, 1476, 1478, 1481, and 1482 included the statement that "Any who carries uncleanliness into the sea fined 3 marks" (*Stockholms Stads Tänkeböcker 1474–1483*). See also the specific entries *Stockholms Stads Tänkeböcker 1474–1483*, 223 and *Stockholms Stads Tänkeböcker 1483–1492*, 116.

[69] See for example the entry for 5 April 1497 when Nichlis the cooper and Sylwaste were each fined 12 marks for uncleanliness they carried into Kornhavn, or Grain Harbor. Nichlis gave 1 mark and Sylwast gave 2 marks at the time (*Stockholms Stads Tänkeböcker 1492–1500*, 324). In 1507 Tomas Finne was fined for 3 marks for uncleanliness he laid in front of the sea and he gave 2 marks (*Stockholms Stads Tänkeböcker 1504–1514*, 172). It is interesting to note that in the council meeting of 29 April 1489, the fine for throwing waste into Kornhavn had been set at 40 marks (*Stockholms Stads Tänkeböcker 1483–1492*, 341). Perhaps this indicates that fines on the books were set higher than actual fines levied for violations.

[70] *Stockholms Stads Tänkeböcker 1514–1520*, 183 and *Stockholms Stads Tänkeböcker 1553–1567*, 45. According to the text, Gregors threw the hammer into the back of the city servant so that the hammer was hanging onto his back: "Och kastade thenne Gregers snickare en hamber epter stadzens tienare, så att han bleff hengiande back i hans rÿgh etc."

Coventry provides our first example of how a city council managed its urban waterway. The city council managed the River Sherbourne on three levels: (1) instituting legal restrictions against waste dumping in the river, (2) assigning inspectors to look for violators of these laws, and (3) organizing river scouring efforts. Legal restrictions against waste disposal in the river are found throughout the period. The 1421 Coventry Mayor's Proclamation forbade the casting of dung from stables and other filth into the river. It set up fines that increased with each successive violation: half a mark due for the first violation, one mark for the second, and one and a half for the third.[71] In 1424, the fee structure was changed to the one and a half mark penalty for every offense. The prohibition was soon reiterated in 1426 and 1429. Sometimes the council got quite specific about who had been dumping waste into the river. In an entry from 1475, the council specified that no inhabitant of Well Street, Bishop Street, Coke Street, or Catesby Land was to put dung or other filth into the river running from the mill in the south part of Well Street to the hospital of Saint John the Baptist. Obviously, there had been waste disposal occurring in those areas and thus the council named them specifically.[72]

In order to enforce these restrictions, Coventry named river inspectors to look for violators of these legal restrictions. An entry for 1426 lists the overseers for each section of the River Sherbourne. These men were charged with ensuring that no waste was dumped into the river, any houses or stables extending over the water were removed, and

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[71] *Coventry Leet Book*, pt. 1, 29.
[72] *Coventry Leet Book*, pt. 2, 417.

any drains running from the houses directly to the river were stopped up.[73] Coventry also incorporated river inspections into the regular duties of its elected officials. The creation of official "searches" of the river for violators was most common in the early period. The council specifically charged the mayor with inspection of the river in 1429, 1430, and 1439 to find out where the river "is narrowed, mysruled, or stopped, or encroached."[74] Unfortunately, we do not know if the mayor continued to perform these searches annually as the required by the council ordinances. We do know that the issue appears 30 years later, when the council ordained that the mayor was to perform inspections of the river at least twice a year. The ordinance stipulated that the oath of the mayor was to be changed to include a river semi-annual inspection.[75] This may mean that the mayor had been lax about the inspections or it could mean that the council believed more frequent inspections would better identify violators. Various officers were given the task of river inspection, including the common sergeant, named overseers, and ward alderman [76] By 1517, the oath for the aldermen in each ward included the responsibility for ensuring that the river was cleaned and the streets were swept;[77] aldermen in turn elected and appointed men within their wards as overseers of the rivers and streets.[78]

Inspections certainly would have identified waste accumulation in the rivers, but then something had to be done to remove it. Orders for cleaning the River Sherbourne

[73] *Coventry Leet Book*, pt. 1, 107–8.
[74] *Coventry Leet Book*, pt. 1, 118.
[75] *Coventry Leet Book*, pt. 2, 347–48.
[76] *Coventry Leet Book*, pt. 1, 91, 108.
[77] *Coventry Leet Book*, pt. 3, 652–53.
[78] *Coventry Leet Book*, pt. 3, 723. In 1518, the leet named searchers of the Broadwell and river sections (*Coventry Leet Book*, pt. 3, 663).

tend to appear about once every ten years. The earliest recorded order was in 1421 when the council ordered the scouring of the River Sherbourne and all ditches within the city to remove filth, dung, and stones which were blocking the waterways before Midsummer's Day. The *Leet Book* entry makes it clear that the waste removal efforts were necessary to increase the channels' carrying capacities in times of flooding.[79] In 1434, a second edict appeared in which the council ordained that the Sherbourne should be enlarged under the mayor's oversight and that every man with a tenement adjacent to the river had to clean it or else pay a fine of 20s. for noncompliance.[80] The council ordered another cleansing of the river in 1444 in which each person was responsible for cleaning the river along their land, beginning at Crow mill and continuing as far as the Priory before Whitsunday. The fine for not cleaning was to be split one-third to the mayor and two-thirds to the wardens who were responsible for presenting violators.[81] The 1444 proclamation may not have been effective because only two years later, the council restated that everyone having lands or tenements adjacent to the river from Crow mill to Gosfordgate had to clean the river before Whitsunday.[82] This time, the cleaning operation must have been relatively successful because the issue does not reappear until 1469.[83] Almost 30 years passed before the council again told those with tenements adjacent to the river that they must

[79] *Coventry Leet Book*, pt. 1, 31.
[80] *Coventry Leet Book*, pt. 1, 170.
[81] *Coventry Leet Book*, pt. 1, 208.
[82] *Coventry Leet Book*, pt. 1, 227.
[83] *Coventry Leet Book*, pt. 2, 347–48.

clean their section of it.[84] The spacing of these orders indicates that although waste was occasionally disposed of in the river as the prohibitions against the practice would indicate, the problem was only serious enough to require special scouring and cleaning operations every ten to thirty years. In the intervening period, waste accumulation may have been gradual and/or the tenement holders regularly cleaned the section of the river which abutted their properties.

In the Coventry example we see that the city responded to river pollution with legislation, inspections and river cleaning. The residents were directly involved in these actions, each householder being responsible for cleaning their land adjacent to the river.

York employed similar tactics. We saw in Chapter 5 that the council was intent on controlling commercial waste disposal in the river, particularly restricting leatherworking to avoid contamination of the water and forbidding the disposal of butchery waste in the Ouse River. In order to enforce these earlier laws, the council created a special water bailiff position in charge of river inspections in the 1540s. The water bailiff looked for individuals who had "cast any ramell, swepyng of howses or gardynes, dung or any other thyngs or thyng into the watter of Owse."[85] The council also organized river cleansing operations similar to Coventry. But in this case, York required the merchant community, the wealthiest of the city's residents, to bear the cost of cleaning up the River Ouse. In 1546, York's council ordered that every merchant send one capable laborer to help clean

[84] *Coventry Leet Book*, pt. 3, 586–87. Another 37 years pass until the council again issues a cleaning in 1534 (*Coventry Leet Book*, pt. 3, 719).
[85] *York Civic Records*, vol. 4, 57–58.

the Ouse during a workday to be supervised by the wardens. Because workers from each of the four wards only worked one day, they were not able to completely scour the river. The following year, the council mandated another workday in which the laborers would "begyn in that warde where as they left the last tyme." Merchants who did not supply a laborer for the cleaning operation would be charged for the cost of hiring one by the city.[86] This was clearly a different tactic than Coventry where individual householders had been assigned this responsibility. The difference likely stems from the commercial importance of the River Ouse, which unlike the non-navigable Sherbourne, was the merchants' lifeline.

Norwich provides the final example of urban river control. The councilmen of Norwich recognized that the River Wensum which flowed through town served "the common utility" and needed oversight.[87] The river was "a thing very useful to the city" so when it was filled with dirt such that the flow of water was prevented, the council was obliged to step in.[88]

The Norwich council believed it was the duty of the city government to organize river cleaning activities. Although the city paid river cleaning supervisors as early as 1367, the efforts relied on citizen labor.[89] The city assembly issued an ordinance for a river workday in 1422. The ordinance gave individuals the ability to choose whether they

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[86] *York Civic Records*, vol. 4, 147, 157.
[87] *Records of the City of Norwich*, vol. 2, 85. This particular passage is about the oversight of Norwich bailiffs of fishing and the setting of fishing nets that blocked the river.
[88] *Records of the City of Norwich*, vol. 2, 96.
[89] *Records of the City of Norwich*, vol. 1, 267. In the accounts for 1401–2, John Swanton was paid for 35 weeks of supervising the workmen in the Common River (*Records of the City of Norwich*, vol. 2, 54).

wanted to labor personally in the cleaning operation or to pay the cost of 4d. a day to hire a laborer to work on their behalf. The constable of each ward was responsible for ensuring that individuals reported for work or paid for their replacement. It was a full day clean-up effort, as the council required individuals to arrive at work by "the 5th hour in the morning and remain until the 7th hour after noon." The city paid for all of the tools and boats.[90] In 1478, river overseers contracted laborers to clear weeds and in 1479 citizens were required to clean the river if they owned abutting property. These orders show the dependence of the city government on individual participation in sanitation projects of the time.

By the 1500s, the Norwich government changed tactics and began managing the river through contracted labor, river commissioners, and taxes rather than depending on individual householders. Until the council designated specialists to handle the river problem, sanitation efforts depended on resident cooperation. This shift will be discussed further in Chapter 7.

The cleanliness of urban waterways occupied an important place in the cityscapes of the late Middle Ages. The cities investigated here shared a common goal of maintaining clean rivers and harbors. They prohibited individuals from disposing of waste into the water bodies and ordered individuals to both physically participate in river cleaning operations and support such operations with their money. Both the individual and city shared in the duties to clean urban waters.

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[90] *Records of the City of Norwich*, vol. 1, 277–78.

## *Sanitation Responsibility*

The various city records dealing with street maintenance and cleaning indicate that the councils diligently implemented both legal restrictions on citizen behavior and new city services to create a sanitary city. Far from being a minor concern, holding the streets and waterways clean and in passable order appears regularly in the records. The councils invested time and money to clean up the urban space and required that individuals living within the city do the same. There was an acute awareness of the interconnected nature of the flows of water and waste through the city – actions on the city streets had downstream repercussions.

Councils made individuals responsible for and aware of the consequences of their actions on the urban environment. Through the city councils' requirements to be involved on the ground level, from physical labor to direct taxation, medieval residents could not avoid seeing their role in shaping their city space. They had financial incentives to comply with council mandates and recognized directly the benefits of waste management. The distribution of power between the city government and citizens both reinforced the role of the medieval city council to coordinate sanitation controls and made individuals responsible for day-to-day operation of the system. Seemingly uncomplicated medieval sanitation technologies – cobbled streets with basic gutters running down the middle – required complicated social structures to make them work.

Splitting the responsibility for sanitation was obviously not without challenges. The dependence on citizen participation meant that sanitation measures were not entirely

under the control of the council. This aspect of the medieval system has been criticized as ineffective. For example, T. P. Cooper argued that "Corporations delegated the duty of keeping the streets clean to the citizens at large, but as they failed to perform this necessary duty, the streets remained dirty and unkept"; Constance Classen, David Howes, and Anthony Synnott stated that medieval waste laws "were often ineffective because they placed too much of the burden for its disposal on individual householders."[91] We saw this problem in the case of Norwich's paving which suffered because of individual neglect. In general, however, this chapter has shown that councils believed individuals could effectively maintain a small amount of pavement or clean in front of their doors; this was not particularly burdensome for householders. However, larger projects such as river cleaning and waste disposal pick-up required much more extensive supervision and coordination. As we will see in the next chapter, cities become more and more involved in providing services through designated officials and hired hands rather than depending entirely on individual householders for these types of projects.

[91] Cooper, "Mediaeval Highways," 271; and Constance Classen, David Howes, and Anthony Synnott, *Aroma: The Cultural History of Smell* (London: Routledge, 1994), 57.

# 7

# Servants, Specialization, and Sanitation

In 1517, the civic council of Coventry enumerated the duties of aldermen, the backbone of sixteenth century city government. The list is instructive about the day-to-day urban problems of the time period as well as the position of the alderman in effecting control:

> "the punyshment of myghty beggers, of vacaboundes, as well wemen as men, suspect alhowses & blynde ynnes, clensyng of the stretes & swepyng of the stretes in-to the giter, but see it be boron a-wey. Also that ther be no swynstyes occupied within the walles of the Citee, nor draughtes apon the comen dykes of the Citee that longeth to the conveyance of the water of the Citee; also to see the pawmentes well pavid; also to suffre no onlawfull games to be vsid; also to se the excersysyng of shotyng in long bowes; also to se ther be no wodyn chymneyes nor howses thakkyd with brome or strawe; and to see the Comen ryuer be well kept accordyng to the auncientes ordynaunces theruppon made; and also that they execute all oder good ordynaunces made for the welth of the Citee within ther warde."[1]

Along with monitoring for moral offences such as illegal gaming and operating illicit alehouses, city sanitation stands out prominently as an alderman's responsibility. His duties included checking the sanitary condition of the streets, ensuring no swine were

[1] *Coventry Leet Book*, pt. 3, 652–53.

kept within the city walls, stopping illegal tapping of the city water supply, assuring adequate street paving, and cleaning the city's river. The council clearly considered these urban sanitation services a necessary part of the duties of alderman, one of the leading civic roles.

We saw in the previous chapter that some sanitation actions, such as paving the streets, depended on resident participation; in this chapter, we turn to the growth of specialized roles and taxes within the city governmental structure to accommodate better service provision. The specialization of city sanitation services during this time allows us to see an urban transition from a top-heavy medieval structure to a more modern dispersed web of responsibility. The period witnessed an increasing reliance on a myriad of officials to provide services. City councils grappled with how to allocate responsibility for sanitation duties among civic officials – the assignment of responsibility shifted often over the period, indicating that the government struggled with finding workable arrangements. In general, the trend was to allocate responsibility closer and closer to the physical problem, i.e. movement from the mayor as overseer to local inspectors.[2] This movement allowed things to get done – a mayor, after all, could not perform all the work himself. Early on, councils delegated waste removal and inspection duties to existing officeholders, including the mayor, aldermen, and sergeants, but later created many new

[2] Paul Slack noted a similar trend in *From Reformation to Improvement* of using more local manpower to enforce poor laws at the very end of the period under investigation here. The 1598 poor relief statutes, for example, prescribed the employment of four overseers in each parish for enforcing poor relief rules (48). Walter King in "How High is too High?" found that even the small town of Prescot (with only 600 inhabitants) created two supervisors of wells positions and later a combined supervisors of wells and streetlookers in the early 1600s, which mirrors the increased number of sanitation jobs in the bigger cities we see here.

jobs, such as "scavenger" and "Surveyours of the Ryver and Streates," delegating responsibilities down the chain of command. The cities, then, not only tapped into the growing urban bureaucracy to clean up the city, but also created additional layers to meet the physical demands of urban life. In addition, the city governments had to fund increasingly complicated sanitary services including water supply networks and river dredging operations. Acquiring such funds also created a need for increased specialization and financial management.

Scholars have typically focused on larger social, religious, and political movements when discussing the formation of the State in late medieval / early modern times. Although there has been an acknowledgement of the role of local authorities in building the state's legitimacy, historians have tended to focus on the cultural context of changes rather than material ones.[3] Matthew Braddick, for example, claims that early modern measures to deal with poverty were "partly designed to promote civility, therefore, not simply to tackle material problems. Fears were prompted by changes in material conditions, but it was the fears rather than the material conditions which really shaped social policy."[4] But, as discussed in Chapter 2, many leading English provincial

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[3] Cf. Steve Hindle, *The State and Social Change in Early Modern England, c.1550–1640* (London: Macmillan, 2000); Joan Kent, "The Centre and the Localities: State Formation and Parish Government in England, circa 1640–1740," *Historical Journal* 38.2 (1995): 363–404; and Slack, *From Reformation to Improvement*. Slack's work on responses to the plague deals more directly with physical constraints of urban life, but even in this work, he emphasizes the religious underpinnings of responses. For a good example of how material conditions can be integrated into studies of state formation, see Paul Warde, *Ecology, Economy and State Formation in Early Modern Germany* (Cambridge: Cambridge University Press, 2006).

[4] Michael Braddick, *State Formation in Early Modern England c.1550–1700* (Cambridge: Cambridge University Press, 2000), 55.

centers, including Coventry, York, and Norwich, faced difficulties in the fifteenth and sixteenth centuries, including trade decline, bad harvests, price inflation, and epidemics. The material pressures, as well as the social perceptions of cleanliness and dirtiness discussed in Chapter 2, prompted cities to take action to clean up the urban environment from 1350 to 1600.

This chapter examines the general trend toward staffing sanitation services close to the physical problem, often at the ward level. It then looks at the financial commitments necessary to carry out sanitation projects and how those needs encouraged further city government involvement. In the third section, an extended case study from Norwich reveals how both of these forces worked to greatly complicate the structure of Norwich's civic government. In this analysis, the chapter exposes the previously unacknowledged consequences of sanitation provision on the growth of early civic governments.

## *Staffing Sanitation Services*

This period witnessed a growth in the number of officials involved in providing sanitation services. Finding workable solutions to sanitation issues, including the provision of drinking water and maintenance of clean streets, was not a given. Rather, the city councils grappled with how to allocate responsibility for sanitation duties among civic officials. The records indicate that responsibility shifted often over the period, often moving from the mayor as sole overseer of sanitation provision to local inspectors who

managed day-to-day operations. In order to see these phenomena at work, we now turn to three short case studies.

## Managing a water supply

The delegation of responsibility for maintenance of Coventry's water supply highlights the complexity of city service provisions at this time. Coventry inhabitants had to obtain drinking water from underground sources because the aboveground river did not have a sufficient flow of clean water.[5] Because of the limited availability of well locations, the Coventry citizens decided early on to build conduits to distribute well water. In 1333, the inhabitants gained permission from King Edward III to erect a conduit for water distribution.[6] This first conduit was connected to Broad Well and others soon followed as shown in Figure 7-1.

[5] Lapworth, "City of Coventry, Report on Water Supply."
[6] Coventry Waterworks Committee, "City of Coventry Water Undertaking. Centenary 1847–1947 Souvenir Brochure."

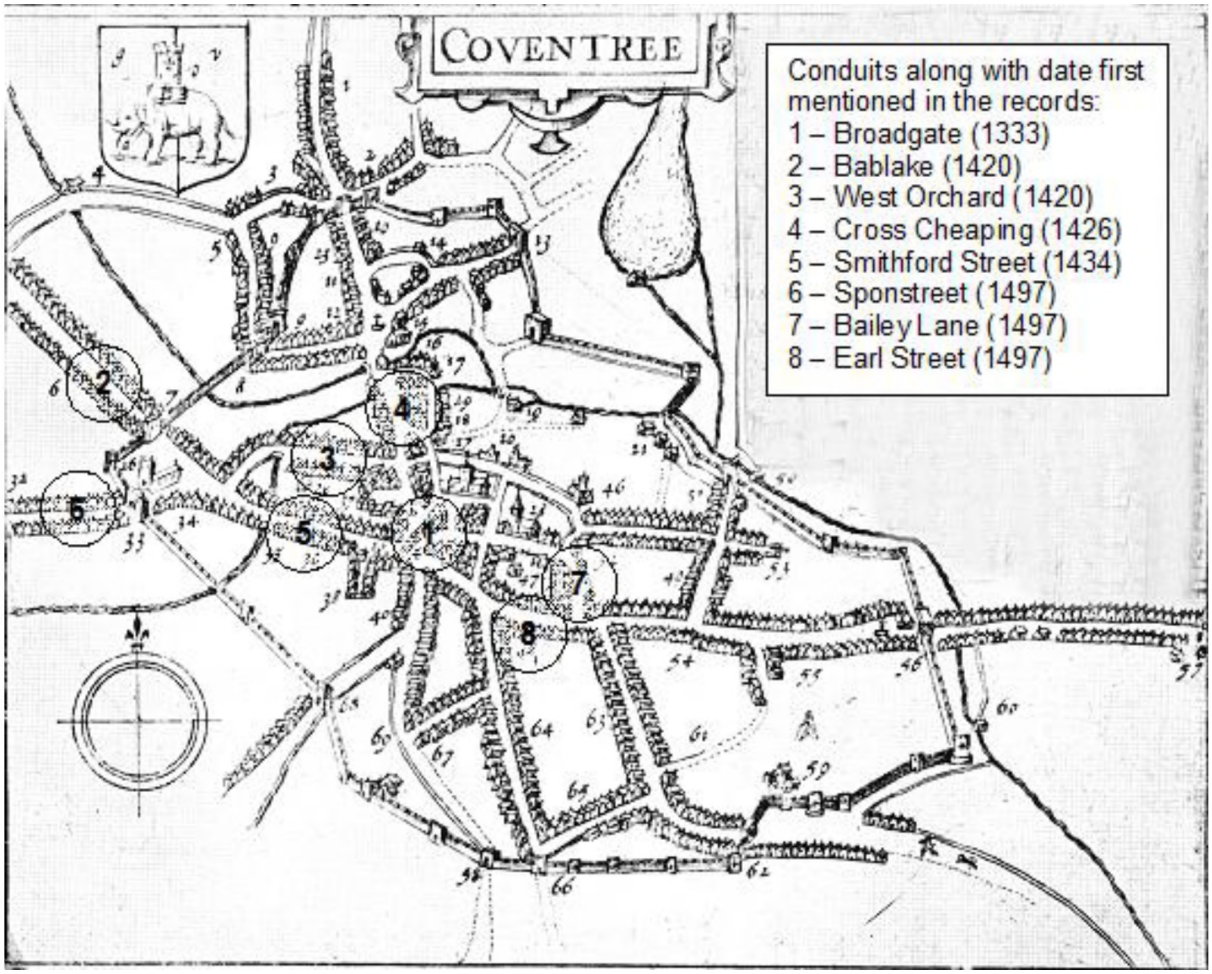


Figure 7-1. Coventry's conduit system by 1500. The base map is John Speed, *The Theatre of the Empire of Great Britaine*, Map of Coventree, 1611.

Although well conduits were constructed to provide drinking water to the city's residents, some commercial users, particularly brewers, butchers and dyers, were quick to take advantage of the ready water supply. Brewers and malters needed large supplies of water for brewing and dressing their beer, butchers used water for the washing of entrails after slaughter, and dyers washed cloths there. The council issued legal restrictions

against industrial use of the conduit water numerous times.[7] In addition to illegal water drawing at the conduit head, some individuals tapped the conduit itself to create personal water supplies. As early as 1404, the prior of the cathedral church complained to the royal authorities that people had been inserting pipes (called suspirals) without his permission to draw water from the underground water-conduit that supplied water to the priory.[8] One of the earliest recorded decrees of the council was to stop up openings in the conduit.[9] As another example, in 1426, John Stafford was accused of building a private well supplied by the West Orchard conduit water using a suspiral constructed out of lime and stone.[10] In order to control these misuses, the government found it necessary to create new administrative positions for conduit oversight and maintenance.

The Coventry council created specialized conduit keeper positions to oversee the conduits. In 1426, the council created two conduit keepers in each urban ward who would guard against illicit tapping.[11] Then in 1444, the council instituted a new system of locking the conduits from 9 o'clock at night until 4 in the morning. In each of the four wards, "an honest man" was chosen to lock and unlock the conduit in his ward. In 1483, the council named two keepers of the conduit in each ward. Unlike the pronouncement of 1444 which specified only that the conduit keeper was responsible for conduit access, this time, the council gave the conduit keepers duties to collect the conduit taxes, oversee

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[7] *Coventry Leet Book*, pt. 1, 208, 225; pt. 2, 338, 517, 572; pt. 3, 788, 812.
[8] "Henry IV: Parliament of October 1404, Text and Translation," ed. Chris Given-Wilson, in *The Parliament Rolls of Medieval England*, ed. C. Given-Wilson et al., item 28. CD-ROM (Scholarly Digital Editions, Leicester: 2005).
[9] *Coventry Leet Book*, pt. 1, 21.
[10] *Coventry Leet Book*, pt. 1, 104–5.
[11] *Coventry Leet Book*, pt. 1, 104–5.

plumbing work, and look for violators of the conduit laws. In 1497, fifty years after the conduit locking was introduced, the council brought up the issue again and mandated the placement of grates and locks on the conduits so that they could be locked at night. In addition, redundant conduit monitoring duties were added to the chamberlain, warden and sergeant positions.[12] Thus by the mid-fifteenth century, Coventry had established a dedicated conduit workforce to maintain and monitor the water supply. In order to control individual use of the conduits, the council created new roles and responsibilities within the government.

## Cleaning up waste

Just as Coventry had to establish conduit keepers to regulate use of the drinking water supply system, the government also found it necessary to establish jobs for managing urban wastes. Coventry had two problems: keeping waste out of the city's ditches and off of the streets.

The first problem was waste disposal in the old castle's fortification ditch, known as the Red Ditch, located in the center of city. The ditch was not connected directly to the River Sherbourne which was located significantly further north within town; therefore, the Red Ditch had no outflow. That had been good for castle defenses, but by the fifteenth century, this was in the middle of town and the ditch became a dumping ground, as discussed in Chapter 3. The Red Ditch appeared often in Coventry's struggles to

[12] *Coventry Leet Book*, pt. 3, 584.

assign sanitation duties to various officers, becoming a more and more well-defined, specific job over time.

In Coventry, the sergeant served as the primary officer enforcing waste laws through the 1400s. The council ordered the sergeant to search for people throwing waste into the river, to stop people from putting their muck in a heap at one of the city's market crosses, and to inspect the Red Ditch for illegal latrines weekly. The sergeant organized the removal of waste piles with city funds, found laborers to clean the Red Ditch, and went through the city streets every Sunday afternoon and Monday to verify that the residents had performed their weekly street sweeping on Saturday and levied fines on lax persons.[13] The mayor always had oversight responsibility and was required to inspect the river for deficiencies in person annually.

By the 1500s, this arrangement had changed. The duty to inspect the Red Ditch for illegal sewage pipes and enforce their removal was passed from the sheriff (1507) to the Mayor and council (1509) to named overseers (1538). On top of these assignments, the Chamberlains enforced the requirement that landholders adjacent to the Red Ditch clean it and they also paid for a laborer to clean the ditch quarterly.[14] This trend indicates a downward movement of responsibility from high officials to specifically named persons.

The second problem was waste disposal in the street. The same readjustment of duty allocation that we saw for the Red Ditch inspections also happened in the case of

[13] *Coventry Leet Book*, pt. 1, 91, 113, 118–19, 170; pt. 2, 361, 586–87.
[14] *Coventry Leet Book*, pt. 3, 628, 702, 728–29.

street cleaning. In 1517 when the council specified the duties of aldermen, the list included punishing those who swept waste into the gutters, overseeing street cleaning, and maintaining the street pavement. But only 18 years later, the council ordered aldermen to appoint two "honest men" in each ward to see to it that no one cast filth in rivers or swept streets during rain.[15] The aldermen, who were responsible for enforcing morality laws such as bans on illegal gaming and illicit brew houses, must have had too many other duties to devote enough time to street cleaning issues. Thus, the city government created street cleaning overseers at a lower level.

The great number of officeholders involved in cleaning activities in the early 1500s indicates that the city government was experimenting with different organizational structures both to enforce sanitation legislation and to effectively carry out discrete physical tasks such as ditch scouring. In general, the trend was to assign the sanitation tasks further and further down the chain of command, making the responsibility localized.

## Failing to serve the public

In Nottingham, the Common Sergeant was responsible for ensuring the city's cleanliness. He both reprimanded sanitary violators and organized street cleaning activities. For the fiscal year 1510–11, for example, the sergeant's accounts included a charge of 11s. 8d. for cleaning the whole town.[16] The people of Nottingham insisted that the sergeant

[15] *Coventry Leet Book*, pt. 3, 652–53, 723.
[16] *Records of the Borough of Nottingham*, vol. 3, 105.

diligently carry out his cleaning duties, and when he did not, the jury at the local court presented the city servant for failure to serve.

Presentments of this kind appear in the sixteenth-century Nottingham Session proceedings, making it an excellent source for understanding how urban residents thought about sanitation. At the quarterly Sessions, members of the jury, who were local urban citizens and not necessarily city leadership, came forward with names and actions they considered unlawful, including immorality, trade offences, and unsanitary conditions such as piling manure in the street. The jury members either had knowledge of the infraction themselves or obtained knowledge of it from other residents. The rolls of the Sessions which record the proceedings are often written in the handwriting of the particular jury member who presented the issue. The Session juries of Nottingham appear to have been quite vigilant at enforcing their urban code. No one was immune to their censure, including the mayor, aldermen, and other civil servants.[17]

The citations of the Common Sergeant tell us about the public expectations of sanitation servants. On January 15, 1515, the Common Sergeant was presented because he "lokes not to the common mukhilles and other common lans, a cordying to his othe." Clearly the jury believed that one of the primary duties of the sergeant, as defined by his oath, was ensuring that urban waste was restricted to the city's common muckhills. The jury indicated that they had complained about his attitude toward these duties in the past

[17] *Records of the Borough of Nottingham*, vol. 3, xii.

to no avail.[18] The Common Sergeant, Richard Byngham, appears to have been particularly lax about his cleaning obligations.[19] He was first presented on July 18, 1524 for not keeping a specific street, Orgen Lane, clean.[20] Then on January 18, 1530, the jury said that Richard Byngham "lookes not to his office" but rather allows muck to be laid in various parts of town.[21] Byngham was cited again in 1547 for allowing the common muckhills to catch on fire.[22] The jury censured two later Common Sergeants as well: in 1556, the jury said that Lawrence Deepdell, the Common Sergeant, was failing to serve in his office by allowing dung accumulation in many places in town;[23] and the jury asked the mayor to speak with the Common Sergeant, William Savage, because muck was laid throughout town due to his neglect.[24] These citations of the Common Sergeant reveal that local inhabitants expected certain city servants to ensure sanitation as part of their regular duties.

Such expectations were not limited to the Common Sergeant. William Hunt, the Common Officer, was presented in January 1545, for his "slothefullness" of not seeing to his duties to keep the city free of filth.[25] In 1542, the jury presented one of the aldermen, Richard Lovat, for allowing heaps of muck to lie at the wharf and in the highway when

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[18] *Records of the Borough of Nottingham*, vol. 3, 344.
[19] According to the Appendix to *Records of the Borough of Nottingham*, vol. 3, Byngham was named as Sergeant of the Commons in 1523–24 and 1531–32 (464). The Appendix lists only when people were elected to an office, not their whole term. He clearly held the position for many other years.
[20] *Records of the Borough of Nottingham*, vol. 3, 357.
[21] *Records of the Borough of Nottingham*, vol. 3, 364.
[22] *Records of the Borough of Nottingham*, vol. 4, 91.
[23] Deepdell was actually cited twice for the same thing in the session – both under the east part of town and constable inquest sections (*Records of the Borough of Nottingham*, vol. 4, 111–12).
[24] *Records of the Borough of Nottingham*, vol. 4, 166.
[25] *Records of the Borough of Nottingham*, vol. 3, 400.

he had been mayor the previous year.[26] The Chamberlains' were also presented as violators for not mending some of the pavement in town.[27] Bartholomew Chetle was cited on July 20, 1523 and January 18, 1530 for letting the market areas go uncleansed, which according to the jury, should have been part of his office.[28]

Sanitation activities were a delineated part of the job description of several city servants of Nottingham. The Common Sergeant, in particular, was held accountable for the cleanliness of the city. When jury members noted muck or other filth accumulating on the city streets, they not only cited the perpetrators,[29] but also the city servants who had been charged with monitoring such activities.

## Growing specialization for sanitation

These cases reveal that the city councils created whole new networks of responsibility and created new positions, including the conduit keepers and Red Ditch overseers, to manage the urban environment. Officers were held accountable for their sanitation duties. Coventry and Nottingham were not alone in such developments. York, for example, established the position of "water bailiff" around 1541 to fine anyone who threw household waste, rubble, or dung into the Ouse River and to keep the river free from obstructions. The position was sworn in each year and the council provided him with a

[26] *Records of the Borough of Nottingham*, vol. 3, 393.
[27] *Records of the Borough of Nottingham*, vol. 3, 344.
[28] *Records of the Borough of Nottingham*, vol. 3, 356 and 364. The text does not give Bartholomew's office. We know that he was city paver by the 1550s, but there is no indication elsewhere that the city paver was responsible for street cleaning.
[29] Citations for making dung piles were common. For example, in 1512, sixteen people were fined (the amounts were recorded) for casting muck in Cowlane and 27 were fined for muck disposal in an illicit muckhill at Marsh end (vol. 3, 338–39).

boat to carry out his duties.[30] In addition, the aldermen and constables of York were responsible for informing their ward constituencies that throwing waste into the river was not permitted.[31] Norwich created a "water bailiff" in 1543[32] and appointed two people to regularly clean the streets.[33] Stockholm also designated a man to keep the city clean and paid him an annual salary in 1481. In 1557, the council hired two people to ensure that no waste accumulated in the gutters or river.[34] Through these examples, we see how the physical needs of the urban population, both waste disposal and water supply, pressured the city governments to designate sanitation responsibilities to specific, named roles. In the increasingly uneasy economic times of the later fifteenth and sixteenth centuries, the trend toward establishing sanitation jobs may indicate a desire on the part of the councils to reinforce order in a time of financial chaos.

## *Making Monetary Commitments*

Supplying sanitation services required not only manpower, but also money. The city governments needed to pay laborers who scoured ditches, carters who took away waste, pavers who repaired pavement, and plumbers who kept the water conduits in order. To

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[30] *York Civic Records*, vol. 4, 57–58.
[31] *York Civic Records*, vol. 3, 95–96.
[32] *Records of the City of Norwich*, vol. 2, 124–25, 91, 85.
[33] *Records of the City of Norwich*, vol. 1, 288.
[34] *Stockholms Stads Tänkeböcker 1474–1483*, 319 and *Privilegier, resolutioner och förordningar för Sveriges städer*, vol. 2, 352. It appears that the council also hired cleaners on an adhoc basis, for example when they paid an unnamed carrier 12 marks to clean up illegally dumped waste (*Stockholms Stads Tänkeböcker 1474–1483*, 333) and when they hired Engelbrecth for 6 marks to carry away filth (*Stockholms Stads Tänkeböcker 1492–1500*, 153).

pay for these actions, the cities experimented with different fund-raising schemes, including the typical taxes and fines, as well as voluntary contributions.

## Paying for water

Providing water on a city-wide basis did not come cheaply, even in the 1400s. Coventry's government found that it needed significant funds to support the conduit system described in the previous section. In 1426, a request for better management of the conduits submitted by residents of the Crosscheaping ward noted that the conduit had been constructed "with gret coste" by leading men of the city "to come into the Croschepyng to ease of all people."[35] From this statement, we can infer that the Crosscheaping conduit was originally a privately funded gift to the city. In order to maintain the conduit on a long-term basis, however, city residents would have to chip in their share. So later that same year, the council demanded that each ward pay for repairs to the conduit or it would be stopped from supplying the ward with water.[36]

The council, however, soon turned to coordinating the conduit repair efforts and funding them from the city coffers. The mayor's account of 1498 indicated that conduit repairs cost £10 that year. In order to pay for this, the council turned to three varieties of funds: fines collected for civil offences, taxes, and voluntary contributions. These sources appear to have been sufficient, since in the 1498 summary, the collections exceeded the expenditures by almost £2.

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[35] *Coventry Leet Book*, pt. 1, 104–5 (in April).
[36] *Coventry Leet Book*, pt. 1, 108 (in October).

First, the city often specified that a portion of fines received for various offences would go toward conduit upkeep. For example, in 1480 the city chamberlains were convicted of not properly handling the city's money; they were fined £10, of which £4 were specifically earmarked "to the vse of reparacion of the Cundites of the seid Cite."[37] A few years later, the council specified that fines collected from those who failed to clean the street would be split between the officer who reported the crime and the conduit upkeep fund.[38] The fine levied on brewers for illegal use of conduit water was split between the sheriffs, the presenter of the default, and the common conduit repair fund.[39] In the 1498 mayor account, fines accounted for almost 40 percent of the conduit expenses.[40]

Second, the city collected taxes to pay for conduit maintenance. In 1483, the overseers collected 1d. each quarter from each door (residential or business) in the four wards served by conduits to pay for a plumber. This tax was reissued in 1497 extending it to several additional wards. In 1498, £8 was "gadered of dyuers persons in the wardes of this Cite" toward conduit repairs. This sum paid for the majority of the conduit upkeep costs.[41] In addition, each brewer and dyer who had special permission to withdraw conduit water paid an additional 6s. 8d. yearly toward "Reparacion of the said Condytes" according to an entry in 1493. At that time, the council listed seven business persons with

[37] *Coventry Leet Book*, pt. 2, 431.
[38] *Coventry Leet Book*, pt. 3, 585–87.
[39] *Coventry Leet Book*, pt. 3, 808–9.
[40] *Coventry Leet Book*, pt. 3, 587–88. Fines of almost £4 were collected that year.
[41] *Coventry Leet Book*, pt. 3, 587–88.

permission for pipes extracting water from the conduits. Several of them paid 13s. 4d., indicating that the charge of 6s. 8d. was per pipe and they owned two water withdrawal pipes, and one paid an unusual amount of 10s.; the total collected was 70s. (£3½).[42]

Third, the city turned to voluntary contributions, particularly for the construction of new conduit service. In 1507, the aldermen of the city along with six of the "most discrete" and "most honest" men of each ward went door to door to ask for contributions toward the making of a new conduit.[43] This tactic may have been undertaken only because of the extraordinary expense associated with constructing a brand new conduit. It was also in line with earlier conduit construction projects which appear to have been privately-funded gifts.

The combination of these funds paid for the annual maintenance of the city's water supplies. The collection of this money as well as oversight of the conduit itself required the establishment of permanent conduit keepers. The difficulties in raising money to fund the conduit, a key civic service, encouraged more governmental complexity.

## Providing paving

The Nottingham city government financed pavement maintenance through the main city budget. The Chamberlains, who handled all the city finances, oversaw and accounted for urban paving. Paving management was considered one of their primary responsibilities.

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[42] *Coventry Leet Book*, pt. 3, 548–49.
[43] *Coventry Leet Book*, pt. 3, 607.

When the Chamberlains of 1514–15 failed to promptly repair the pavement "in many places of the towne," they were presented as negligent in the session court.[44]

The Chamberlains' accounts list the supplies and labor expenses for paving in great detail, making Nottingham's records a valuable source for these details. For example, in the financial account for 1463-4, the Chamberlains entered the heading "The Costes of Pavyng." Under this heading, the items recorded were: the paver's labor (43s.), 14 loads of stones (25s. 3d.), 17 loads of sand for the pavement base (4s. 3d.), laborer to carry the sand (6s. 7d.), a wheel barrow used by the pavers (10d.).[45] In 1485-6, the costs were even more detailed under the heading "Costes and expenses made in pavyng of diuerse stretes of the town." In this case, the Chamberlains listed the names of the persons who supplied every load of stone and sand used in the paving, those who cleaned the street before the repaving took place, and the pavers for each paving operation. The list runs to 46 line items. Paving took place on several days: December 12, December 24, January 25, March 1, March 6, March 13, March 28, March 29, May 4, May 10, May 12, May 14, May 16, May 24, May 31, and June 8. The cost of the paving for the year totaled 85s. 6d., making it 19 percent of the city's expenditures for the year.[46] In 1495-6, highway and general street repair also came to 18 percent of the total Chamberlain

[44] *Records of the Borough of Nottingham*, vol. 3, 344.
[45] *Records of the Borough of Nottingham*, vol. 2, 372.
[46] *Records of the Borough of Nottingham*, vol. 3, 259–60 (paving expenses), 266 (total for the year).

accounts.[47] Paving was clearly a significant portion of the city's budget and required a considerable amount of the Chamberlains' time.

The city paver was a servant of the city. In 1501, Nottingham named Henry Chetelle as the paver for the year. He was given wages of 33s. 4d. and a gown in exchange for this services to "make and mende alle the defautes in alle places of the seid town in the pamentes." The Chamberlains had to find stone and sand for his use.[48] It is clear from the financial statements that they did. Henry's son Bartholomew later took over as city paver. In 1553, the city jury fined him 4s. 4d. for failure to perform his office. According to the jury, Bartholomew did not ask the Chamberlains for sand and stone even though pavement was in need of repair because of "hys neckelygence."[49] A later city paver, William Wildey, was also cited for not doing his duty of paving the town in 1566.[50] In 1577, the jury ordered Mr. Wildey to work on street paving 40 days without wages because he had failed to keep up their condition. The Chamberlains were ordered to bring him stone for the paving.[51] These citations indicate that the city paver was expected to identify pavement deficiencies and ask the Chamberlains for supplies to repair the pavement regularly.

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[47] *Records of the Borough of Nottingham*, vol. 3, 291–93 (paving expenses), 295 (total for the year).
[48] *Records of the Borough of Nottingham*, vol. 3, 309.
[49] *Records of the Borough of Nottingham*, vol. 4, 106.
[50] *Records of the Borough of Nottingham*, vol. 4, 130.
[51] *Records of the Borough of Nottingham*, vol. 4, 171. The jury orders the same thing again in 1579 (vol. 4, 190–91).

Nottingham's financial commitment to paving the streets of the city is clear from the Chamberlains' accounts. With expenditures totaling almost one-fifth of the city's outlays, paving was a major part of the late medieval city's services.

## Financing sanitation

The cases above demonstrate that these civic governments invested both time and money in the provision of sanitation services in spite of general financial difficulties of the times. Services such as water conduits and paving demanded long-term funding commitments. Collection of taxes to provide for waste removal services was also a common practice. In Coventry, the council authorized the street cleaner to collect 1d. from every door and shop to pay for his services in 1420.[52] The council reissued the tax in 1452 and 1493.[53] The council also ordered a cart to clear away muck accumulated on Much Park Street in 1470 and designated the same door-tax for it.[54] In Norwich, the council provided two weekly muck carts to serve nine parishes. The council listed the amount each ward was required to contribute toward the common carts, which ranged from 6s. 8d. to 40s.[55] The council required the commoners to pay for waste services and thus had to organize the collection of the money.

The need to obtain and manage this money prompted the city governments to name tax collectors and track monetary expenditures. In Stockholm, for example, city

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[52] *Coventry Leet Book*, pt. 1, 21.
[53] *Coventry Leet Book*, pt. 2, 273, 552–53.
[54] *Coventry Leet Book*, pt. 2, 361.
[55] *Records of the City of Norwich*, vol. 2, 110.

servants collected the monetary fines for sanitary violations. These collectors were not always welcomed – as we know from the case of Simon, the city servant who ended up with a hammer in his back when he showed up at Gregors the carpenter's home to collect a fine for improper waste disposal.[56] Fines such as these collected for uncleanliness were often channelled back into sanitary services, as in the case of fines allocated for Coventry's conduit repairs discussed above. Fines, thus, supplemented taxes to finance the sanitary services provided by the city governments.

## *Maintaining Norwich's River*

Finally, we look at an extended case of sanitation provision: the dredging of Norwich's river. Through this case, which runs from 1367 to 1570, we can see in detail how the physical requirements of river maintenance continuously encouraged the city government to delegate responsibilities to specific individuals and prompted the government to experiment with various schemes for financing the labor involved.

The River Wensum snakes through the city of Norwich (see Figure 2-2) and was a primary commercial route. The Norwich council recognized that the river served "the common utility" and needed oversight.[57] The river was "a thing very useful to the city" so when it was filled with dirt such that the flow of water was prevented, the council was obliged to step in.[58] Weed overgrowth in the river was a habitual problem in Norwich and

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[56] *Stockholms Stads Tänkeböcker 1553–1567*, 45.
[57] *Records of the City of Norwich*, vol. 2, 85. This particular passage is about the oversight of Norwich bailiffs of fishing and the setting of fishing nets that blocked the river.
[58] *Records of the City of Norwich*, vol. 2, 96–98.

filth deposited in the river was seen as a leading cause.[59] The response was simple: clean-up the overgrown river and dig out the accumulated waste and silt using city funds. But organizing such a service was not a simple matter. Over the course of 200 years, various city officers were involved in the operations and the council created new, dedicated positions to deal with the river problems.

Norwich coordinated river cleanup operations through the appointment of work supervisors and relied on day laborers. At least as early as 1367, Norwich paid for expenditures for workmen and equipment cleaning the river: two men were elected in 1367 to supervise river cleaning and each received half a mark per week; a supervisor of workmen was paid for 35 weeks in 1401-2; and the purchase of scythes and sickles is listed among the river expenses in 1405-6.[60]

Norwich also used residents' labor in river cleaning, similar to the cases explored in Chapter 6. The council required that individuals dwelling in particular wards clean up the sections of the river in those areas. In 1422, the city assembly issued an ordinance for a river workday. They gave individuals the ability to choose whether they wanted to personally labor in the river cleaning operation or to pay the cost of 4d. a day to hire a laborer to work on their behalf. No one, regardless of their status or position, was exempted. The constable of each ward was responsible for ensuring that individuals

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[59] The King of England ordered the bailiffs of Norwich in 1378 to inspect the river because on one side of the city it was choked with grass and on the other side, the dry ditches were obstructed with mud and filth thrown in them: *Patent Rolls,* Richard II, vol. 1, 121. The Norwich city council made a similar observation that weeds were growing in the river and that filth was entering the river through the ditches and gutters (*Records of the City of Norwich*, vol. 2, 115).

[60] *Records of the City of Norwich*, vol. 1, 267 and vol. 2, 54.

reported for work or paid for their replacement. This was a full day clean-up effort, as the council required individuals to arrive at work by "the 5th hour in the morning and remain until the 7th hour after noon." The city paid for all of the tools and boats. The mayor was permitted to appoint overseers for the project.[61]

Such community-involved projects appear to have been regular features of Norwich's approach to the river problem. The council, which included the Mayor, Sheriffs, Aldermen, and 60 citizens, voted unanimously to require that all city dwellers, except the very poor, to help clean the streets and regrade them in order to prevent waste from clogging the river. The council decided that two supervisors in each ward would certify that everyone participated in the work and verify that no waste was thrown in the street in the future. In addition, the Mayor was held personally responsible for ensuring that the road work was carried out.[62] The trend of community involvement is seen as well in 1479 when citizens were required to clean the river if they owned abutting property.[63] In all of these cases, the council required citizens (or paid laborers working on their behalf) to participate in river scouring and placed governmental supervisors in a coordination role.

By the early 1500s, the council implemented several different river cleaning schemes. It appears that the city council had grown weary of relying on individual inhabitants to clean the river directly. Thus in 1517, the council issued a one-time tax to

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[61] *Records of the City of Norwich*, vol. 1, 277–78.
[62] *Records of the City of Norwich*, vol. 2, 96–98.
[63] *Records of the City of Norwich*, vol. 2, 102.

collect a total of £40 to be used for river cleaning, presumably for supplies and workmen. The constables went door-to-door to collect the tax. In the same act, the council hired a "channel raker," who collected muck from the streets weekly, and the council decided to raise an additional £10 to buy a dung cart for him to carry away the muck.[64] Here we see the first attempts by the Norwich council to "professionalize" the sanitation work by giving an official title to a funded position.

But this experiment in professionalization did not keep the council from continuing the older model of the community supplying laborers. In 1532, the council placed the responsibility for supplying river workmen on the town elite: the Justices of the Peace had to supply workmen for 4 days each year; aldermen 3 days; brothers of St George 2 days; and others, particularly nuisance industries such as tanners, dyers, and parchment makers could be required to supply laborers at the Mayor's discretion. The order required every owner whose property directly abutted the river to cut the weeds from the property to the middle of the river every year. The Mayor himself was to approve laborers as able-bodied and the Mayor and Justices of the Peace had to assign surveyors and overseers for the work.

By 1552, the situation had reached a crisis point. In the council minutes, the councilors lamented that although ordinances had been made for the maintenance of

[64] *Records of the City of Norwich*, vol. 2, 109–10. Interestingly, Slack picks up this Norwich order as an example of the influence of Cardinal Wolsey on city social reforms, which he claims was widespread (Slack, *From Reformation to Improvement*, 15–16). However, as is obvious from the discussion in this paper, the 1517 orders were simply one development in a long line of ongoing attempts by the Norwich city council to maintain the city's river and ditches. Wolsey's visit may have been the impetus for the council's actions at that particular moment in time, but it should not be given undue significance in the overall sanitation developments.

clean streets and river, "the seid streetes remayne fowle and fylthye; and also the seide ryver decayethe and fyllethe moore and moore, what for want of dewe executyon of the seide former actes, and for wante of money and other provysion wherewt to doo the yerely and contynewall charges in and abought the same." They identified the problem both as a lack of commitment to the cleaning programs and failure to properly fund it. So, the council developed an extended plan.[65]

Under this plan, the council set up the "Surveyours of the Ryver and Streates," a body made up of two aldermen and ten citizens (called "the 12"). The surveyors had three charges: plan the work; enforce the laws; and fund the cleaning efforts. First, they were to survey the condition of the river and streets and develop a plan for the monetary expenditures toward scouring and cleaning them for the next year.

Second, the 12 were to enforce all previous city laws concerning the maintenance, preservation, scouring, cleansing, and cleanliness of the river and streets. The group was to collect all fines related to violations of the said ordinances and put the money to use in the ongoing cleaning efforts. They had the right to arrest any person, both citizens and foreign inhabitants, who disobeyed the sanitation laws, failed to pay cleaning taxes, or failed to labor in reparation and cleansing projects for the river and streets. The arrested individual was to be presented to one of the aldermen of the group who would commit the person to prison. The alderman was then responsible for informing the Mayor or his

[65] *Records of the City of Norwich*, vol. 2, 127–30.

deputy of the charge. The Mayor had the responsibility to establish the fine or prison sentence.

Third, the surveyors were to manage funds for the cleansing efforts. They were ordered to establish a tax on all citizens and foreign inhabitants (except the council members and Company of Livery members) for the annual repair and cleansing of the river and streets payable the first of March. The amount of this tax on commoners was not set in the ordinance. However, the council did establish a fee schedule for the more upstanding citizens: the Justice of Peace, 2s.; Aldermen, 18d.; and Livery Company members, 12d. These were the same governmental positions that had been required in 1532 to provide laborers for the cleansing projects. The surveyors also had the right to levy a special tax on businessmen considered particularly noisome to river, such as dyers, tanners, parchment makers, brewers, etc., and charge the miller a negotiated sum for cutting weeds. In addition to these taxes, an additional £14 would be given out of the general city revenues to the surveyors for use in their projects. The group was charged with handling all bequeaths toward river and street cleaning. The council mentioned that two former Aldermen had recently given money in their wills and this money, as well as future gifts, would be handed over to the surveyors.[66] The Surveyors kept account books

[66] The giving of money toward river cleaning was not a new practice. Ralph Segry had bequeathed £10 for cleansing the common river of the city nearly one hundred years earlier. According to the city council meeting notes from 1456, the council was seeking recommendations on how to spend the money. *Records of the City of Norwich*, vol. 2, 92.

separate from the general Chamberlain's city accounts beginning four years later in 1556.[67]

The level of authority given to the "Surveyours of the Ryver and Streates" is quite clear. The group had administrative, judicial, and financial responsibility for the ongoing efforts to clean Norwich's river and streets. The commitment to sanitation by the city is also evident, both in terms of setting up an organizational structure to manage the duties and funding them out of the city coffers. The seriousness of the surveyors' position is evinced by their ability (and obligation) to arrest sanitation law offenders and develop plans for the cleaning efforts.

Norwich established additional dedicated positions for city sanitation. In 1570, the council commanded the aldermen and "best commoners" of each ward choose one man called a "Skavenger." The Scavenger was given full responsibility for daily street cleaning, just as the Surveyors had been set over the larger river and street upkeep projects. The duties of the Scavenger included keeping waste out of the streets, maintaining pavement, and guarding against fire. First, the Scavenger was to see that all owners and inhabitants of houses and churches swept all waste from the middle of the street channel every week on the appointed day. If someone was remiss in these duties, the Scavenger had to collect a fine that would go toward the cost of street cleaning. If a particular house or ground was unoccupied, the owner would be charged for the Scavenger's labor to clean the street. Scavengers not presenting defaulters within four

[67] The books survive in the Norwich archives, Case 19 b according to John Tingley, "Introduction," in *Records of the City of Norwich*, vol. 2, cxxxi.

days were charged double the fine, so they had a financial incentive to enforce the laws. Every Scavenger also collected a quarterly tax allocated toward the wages of a waste carrier and referred those who did not pay to the alderman. Second, the Scavengers were responsible for general pavement upkeep. They commanded those with decayed pavement to amend it, and if the owner refused, the scavenger could assign a workman to the task and then charge the owner. Third, the Scavengers were to ensure that every chimney was properly swept to guard against fire.[68] The Scavengers served as official representatives of the city, just as the Surveyors did. The mayor was required to administer an oath of office to each Scavenger, solidifying the job's official standing. The Scavenger, thus, served a vital role in monitoring and providing for city cleaning efforts.

Through this extended case of river cleanup in Norwich, we can see how the desire to provide cleansing services provided incentives for changes in the Norwich government. First, Norwich's creation of the specific titled jobs of "Surveyours of the Ryver and Streates" and "Skavenger" in the mid-1500s shows how much governmental structures for sanitation had changed since the early 1400s. The duties of river and street cleaning required complex and continuous planning, enforcement, and funding. The city could no longer rely on ad hoc management of the problem through work supervisors and the Mayor's oversight. More people at the ground-level were needed to make the

[68] The council also discussed fire as a major urban problem in the assembly on the same day that they established the Scavenger position. They ordered the use of tile or shingle roofing on all new roofs and for repairs and commanded the churchwardens to have a certain number of fire buckets and ladders available in each ward. Members of the livery also had to own at least one bucket and ladder for use in an emergency (*Records of the City of Norwich*, vol. 2, 137–40).

sanitation project reality. Second, Norwich had to fund its ongoing sanitation services and experimented with several tax plans to provide the necessary revenue. Both developments reveal how the physical demands of urban life directly affected governmental forms.

## *Sanitation and Governmental Growth*

Although the physical environment has often been overlooked in historical treatments of civic development, this chapter has shown the centrality of sanitation services to governmental growth from 1400 to 1600. The examples reveal a transition from a top-heavy medieval structure that put sanitation in the hands of the highest civic authorities to a dispersed model of responsibility with involvement at site-specific, local levels. There is a clear trend toward specialization, as evidenced in the establishment of positions for conduit keepers, street cleaners, waste carters, and river overseers. This was necessary because the physical infrastructure required regular oversight – conduits needed to be locked daily, waste carted away weekly, and the river dredged in a large scale annual operation. In addition, these services required financing, so the civic governments gathered taxes, allocated fines, and even asked for donations to support these long-term projects. These developments occurred in spite of general urban difficulties including depressed economies and shrinking populations.

The physical demands of urban living – the need for drinking water, waste disposal, and clean rivers in the city – cannot be ignored in studies of the development of early civic governments. Governmental developments, which in the past have been put

into the context of larger social, religious and political movements, included the urban environment as a key forming influence. The city governments actively developed strategies to provide sanitation services, even experimenting with organizational structures that would later become characteristic of modern city management.

# 8

# Conclusion

> We commaund that no man by hym-self, ne by his servauntes, cast no dong of hur stablez, ne non othur fylthe in the comune Ryver…
>
> Ne that no man Carry no dong out of hur houses ne out of hur stables in-to the strett, but if they haue Cartes redy to carry hit a-way…
>
> Allso that euery man mak his pauement clen be-for his housz euery Saturneday in the yer, up the peyn of xij d. at euery trespas…
>
> That euery man voide afor his ground thorugh the watur, and dyche and clense hym vnto his old ground, to thend the waturs in flod tyme may the lyghtlyer passe…
>
> And that all the previes vpon the same Red-dych be remouyd, & done a-way…
>
> nyght eschewyng perell of ffloodes fallyng in nyghttyme…
>
> Allso that no maner of bocher fro this tyme forward sle no maner of beest within the wall of this cite saue onely Swyne.
>
> Mayor of Coventry, 1421[1]

This extract from the Coventry mayor's proclamation of 1421 encapsulates many of the sanitary problems in the late medieval city discussed in this work. First, Coventry, like the other cities discussed in Chapters 3 and 4, legislated against improper waste disposal

[1] Coventry Leet Book, pt. 1, 29–32.

– it forbade disposal of dung and filth in the streets and river and struggled with restricting latrine placement on the Red Ditch in order to control organic waste disposition. Second, as highlighted in Chapter 5, the city government was not averse to issuing legislation targeted at environmentally harmful crafts such as butchers. Third, it required active participation by residents to maintain clean streets and scoured ditches, as discussed in Chapter 6. Finally, although not mentioned in the 1421 proclamation, Coventry also turned to specialized service providers, such as William Oteley who "kept a cart & horses for clensyng of the stretys," a trend we saw in Chapter 7.[2]

Throughout this analysis, we have seen how private needs – ridding oneself of accumulated waste, obtaining clean water for craft use or drinking, having usable transportation routes on streets and rivers – required direct city government intervention in the period 1350 to 1600. Urban life, with many people living in shared spaces, required coordination and oversight. The city councils took it upon themselves to serve in this capacity to create public order out of potential chaos. The councils not only required proper clean behavior, but also provided for public services such as ward dung carts and common latrines and organized cleaning efforts.

## *Public Order*

The evidence presented here affirms the notion that city councilmen believed sanitation was part of an orderly city. The concerns discussed in Chapter 2, particularly obstructions and disease, reoccur throughout the period. These nuisances disrupted order – socially,

[2] *Coventry Leet Book*, pt. 1, 21.

morally, and economically. By controlling these negative aspects, the city councilors attempted to provide public order.

Sanitation laws were passed to ensure the public's welfare. Norwich's council called the laws requiring the regular cleaning and paving of streets and scouring of the river "good and godly actes and ordynaunces."[3] Coventry's council likewise considered sanitation laws as "good ordynaunces made for the welth of the Citee."[4] "Good rule of the Citee" was only maintained when the ditches and gutters were free from filth.[5] "Godemen" were those who kept the streets and markets clean with "much duty and obedience."[6] The moral underpinnings of sanitation action are evident in the quotations. The good and godly were linked to a clean, orderly city. The city councils believed it was both their duty and right to manage behaviors and provide services to ensure such a good and godly urban environment.

These provisions became city custom, i.e. an expected part of the councils' duties. Just as York's payment for upkeep of the Ouse Bridge latrine and its light was customary,[7] enforcing sanitation laws, offering services such as waste carts, and organizing river scouring became a normal part of councils' actions. These activities aligned with other areas of council control such as regulation of victuals and enforcement of moral laws against gambling and illicit alehouses. Sanitary restrictions were not in the interest of the elites alone, but rather benefited the entire community, its commonwealth.

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[3] *Records of the City of Norwich*, vol. 2, 127.
[4] *Coventry Leet Book*, pt. 3, 653.
[5] *Coventry Leet Book*, pt. 3, 631.
[6] *Stockholm Tänkeböcker 1514–1520*, 288. Original is "wid storsthe lydno och pligt."
[7] *York Bridgemaster Accounts*, 296.

By passing sanitation laws and coordinating services, the elites who sat on the city councils acted within prescribed communal norms and did their best to mitigate conflicts between private parties when it came to sanitation needs.

## *Measuring Effectiveness*

One question always lingers when discussing sanitary provision in the medieval period: Did these efforts work? As discussed in Chapter 1, the general conclusion in recent scholarship such as *Straws in the Wind* is that the city efforts made little real difference. The records do show that legislation was reissued over time. But although there are multiple complaints in the records, we must remember that these are spaced out over extended time periods. For example, bans against throwing wastes into the streets or sweeping the gutters appeared 10 times over a span of 131 years in Coventry.[8] This means that not everyone was 100 percent committed to a spotless city. However, it also shows that when individuals violated common waste disposal norms, the civic authorities addressed the issue. When a problem was habitual, such as the selling of bad meat in the marketplace, the councils certainly had no problems reissuing legislation, but what we see is that they did not have to do this very often with most sanitation laws. We should read these sanitation laws, then, as noting exceptional bad behavior. If the inhabitants normally accepted wastes piled up in their streets, they would not have complained about it nor would the councils have taken steps to reverse the effects or change the behaviors. Therefore, conclusions based on documentary records alone may not suffice.

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[8] *Coventry Leet Book.*, pt. 1, 29–30, 208, 234; pt. 2, 306, 418, 565–66; and pt. 3, 631–32, 720–21, 723, 804.

Archeological evidence can help us to decide whether or not the streets were common trash receptacles. Derek Keene argues that the streets of Winchester, England, were clearly used for waste disposal because archeologists found thick deposits of muddy soil containing animal bones and pottery between the paved surfaces. In his assessment, "in wet weather most streets and lanes must have been at least ankle-deep in refuse."[9] However, it is possible that the "accumulation" layers found in archeological excavations did not accumulate over extended periods of time but represent the intentional use of waste as fill material. Waste was commonly used before 1350 as leveling material and fill to reclaim land from swamps and bays. Even in the late medieval period, waste may have been sometimes used as fill. The Nottingham city expenses recorded in detail the costs of paving the city's streets and one entry recorded paying for "carying of ramell to the same lane to highten it with."[10] In this case, "ramell," meaning rubbish or rubble, was clearly placed on the old street surface as part of the leveling activities prior to laying the new paving on top of it. The possibility that waste layers in the archeological record were intentional fill should not be overlooked.

Other physical evidence indicates, in fact, that there was not much urban waste accumulation in the late medieval period. By the late medieval period, cultural layers (i.e. waste-containing deposits) become rarer in the archeological record in the Scandinavian

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[9] Keene, "Rubbish in medieval towns," 28 and Derek Keene, *Survey of Medieval Winchester*, vol. 1, part 1 (Oxford: Oxford University Press, 1985), 53. Keene says that there are regular presentments in the Winchester city court for throwing dung and rubbish into the streets, but also indicates that the problem shows up most often in the marketplaces, a cemetery, and one particular street. His generalized assessment of the street conditions in Winchester, therefore, might be an overstatement.

[10] *Records of the Borough of Nottingham,* vol. 3, Particulars of the Chamberlains' Expenditure 1485–86, 260.

cities. In Lund, Sweden, an archeological investigation revealed 5 meters of cultural layers dated from the year 1000 to present. Eighty percent of the accumulation (4 meters) can be dated from 1000 to 1300, and only about 0.3 meters from 1300 to 1500. Anders Andrén interprets the thinner cultural layers in the late medieval period as signaling less garbage disposal in the city and/or more extensive cleaning that the earlier medieval phases. In Roskilde, streets accumulated cultural layers consisting of animal dung, human feces, food waste, workshop waste, and building material before 1400, but there was much less accumulation after that date. Hannah Koch surmises that stone paving and the growing urban population and density created the need to regularly clean the streets. She also notes that little new paving was required after the end of the 1400s because waste was no longer accumulating on the streets. The cultural layer accumulation in Bergen also decreased measurably in the late medieval period; it was significantly reduced in the Bryggen area after 1413 and at the same time, there was less accumulation in the northern part of Øvrestretet. Scandinavian archeologists have identified similar trends in Trondheim, Oslo, Ålborg, Kolding, and Århus. This shows that less waste was deposited within the urban core and was instead taken outside of the city walls for disposal. The trend toward less waste disposition within the urban space signals that city residents were not throwing their wastes into the streets and neighbors' property indiscriminately.[11]

[11] Andrén, "I städernas undre värld," 260–64; Koch, "Middelalderens gader," 269–71, 293; Økland, "Det ureine avfallet," 101. The deposition of household waste "was clearly reduced from the 14th century" in Århus, Denmark, according to Skov, "The Infrastructure in Århus," 560. See also Jörpeland, "Den grå vardagen," 61–63.

The archeological evidence thus indicates that city officials and residents maintained relatively clean streets. By making residents responsible for cleaning the streets in front of their doors, the overall condition of the streets was preserved. In the late medieval period, some waste in the streets may have been a daily reality, just as street littering is today, but streets covered with several inches of refuse do not appear to have been a regular part of urban life.

## *Fallacy of "High" Technology*

I believe that modern scholarship and popular literature portray the medieval city as unclean because we judge medieval cleanliness in comparison to modern technological standards. It is easy to think that the cities were dirty because medieval households lacked flush toilets and cities functioned without engineered landfills. Yet the lack of complex technology to manage waste does not mean it was indiscriminately handled. As we have seen, waste was handled relatively effectively though simple technological and complex social arrangements; through a combination of individual resident responsibility for tasks such as weekly street-sweeping and coordinated simple city services such as a waste cart.

Seeing the value of less complex sanitation technology has direct applications today. Contemporary efforts to bring sanitation technologies into developing countries have historically been unsuccessful because of misplaced faith in complex systems. As Joel Tarr has observed, complex water and waste handling technologies often have

unintended consequences, making the situation even more complicated. Professionals often make assumptions about the desirability and acceptability of low-tech systems, such as pit latrines, in urban settings without considering the actual performance of similar systems or user satisfaction.[12] In contrast, some programs have focused on community-involvement and more modest technologies. The Ecological Sanitation movement, for example, advocates onsite containment, sanitation, and recycling of human excrement rather than building complex wastewater treatment plants and sewer lines.[13] The non-profit Water and Sanitation Program of the World Bank, for example, has shown success in improving public health through simple waste collection and latrine systems when individuals and communities cooperate. Several case studies of waste management initiatives in Indian urban areas show the clear benefits of the fostering of community engagement and delegated responsibility to vastly improve waste collection efforts.[14] The program only invests "in response to a real demand by communities and households" because they want the systems to be actively used and maintained by community members. For this reason, they actively promote educational campaigns to increase awareness of hygiene issues and advocate appropriate technology options. Their studies have demonstrated that sanitation program success requires grounding of the technological choices in a local context, community support, and municipal authority

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[12] Darren Saywell and Andrew Cotton, "User perceptions in urban sanitation," paper presented at 24th WEDC Conference, Sanitation and Water for All, 1998.

[13] There are multiple Ecological Sanitation research and implementation programs, including the United Nations Development Programme, EcoSanRes, and the International Water Association's Specialist Group "Resources Oriented Sanitation."

[14] Vandana Bhatnagar, "Solid Waste Management Initiatives in Small Towns," Case Study (Delhi: Water and Sanitation Program-South Asia, 2006).

coordination and funding. [15] The late medieval cases described in this work demonstrate that simplistic sanitation technologies, under the right cooperative circumstances, can be effective.

Road maintenance, waste handling, and river management all required more than technology to function in this period. Without significant financial, labor, and structural investments such as a standing sanitation department, as would be the case in the nineteenth century European city, the medieval city councils had to rely on social arrangements to create functional sanitation systems. The city governments coordinated citizen efforts as well as their own city servants and services. Systems which appear to us on the surface to be simple such as gutters and ditches required intricate socio-technical arrangements in daily practice.

## *Tying the Social and Technological Together*

Throughout this dissertation, we have seen that medieval sanitation cannot be examined from a legislative perspective alone – that only gives a part of the story – nor can we look only at the physical evidence to understand how it was integrated into the medieval social systems. Instead, we must view medieval sanitation as a complete package: legislative

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[15] Water and Sanitation Program, "Sanitation and Hygiene," http://www.wsp.org/themes/index.asp?id=5. Some example studies are Water and Sanitation Program – South Asia, *Solid Waste Management Initiatives in Small Towns: Lessons and Implications* (New Delhi, 2006) and Water and Sanitation Program – Africa, *From Burden to Communal Responsibility: A Sanitation Success Story from Southern Region in Ethiopia* (Nairobi, Kenya, 2007). In spite of this emphasis on communal responsibility, we should not overlook the role of political and administrative actors, who obviously heavily influence the success or failure of sanitation systems (cf. R.G. Feachem, "Community Participation in Appropriate Water Supply and Sanitation Technologies: The Mythology for the Decade," *Proceedings of the Royal Society of London Series B, Biological Sciences* 209.1174 (July 28, 1980): 15–29). As this article shows, the government's role as enforcer, administrator, and coordinator was also critical in medieval times.

commands restricting behaviors, services provided and organized by the city, and physical technologies set in place and maintained by the community. When the sanitary condition of the late medieval city is seen from this vantage point, we realize how complex the system was. The urban environment certainly posed challenges, including the disposal of waste, provision of clean water, and management of urban livestock. But the city residents did not have to live in filthy conditions. The city's sanitation depended on the participation of residents for upkeep of the streets and rivers; the collection of taxes and fines to pay for infrastructure maintenance; and the involvement of a myriad of city officials. The medieval city governments of England and Scandinavia were heavily involved in urban sanitation projects and this resulted in new specialized city servants and financial management. Their ongoing concerns for providing public order prompted these changes. Seen as a whole, these social-technological systems appear much less primitive than has been previously assumed and may have been more effective as well. The medieval urban fabric was not a given – it was shaped by the city government's actions and urbanites' involvement.

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