

CHAPTER ONE

Environment: Managing Urban Sanitation for *Sanitas*

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INTRODUCTION

The word *sanitation*, which has the modern connotation of cleanliness, derives from the Latin *sanitas*, meaning health. The word *sanitation* in various forms shows up in all sorts of modern conveniences from hand sanitizer to sanitary napkins/towels to sanitation departments that collect urban household trash. This kind of sanitation, which most specifically arises in the context of urban cleanliness, is a nineteenth-century innovation (Melosi 2000). Although sanitation as a word did not exist in the Middle Ages, *sanitas* certainly did. Just as their modern counterparts do, medieval urban residents also associated cleanliness with health while conversely associating filth with corruption and unhealthy living conditions.

This chapter discusses conceptions of environmental risks to health in medieval towns and cities. The investigation is divided into three parts: identifying sanitation problems, adding infrastructure to better sanitary conditions and enforcing standards. The first section shows that unhealthy urban environments were defined through sensory perceptions – noxious smells, potentially dangerous sights and foul tastes. While the humoral theory of disease shaped some of the understanding of disease transmission, evidence indicates that the senses played a more direct role in determining cleanliness versus filth. Food preparation

(particularly butchery), craftwork that handled organic matter such as dyeing and leatherworking, latrine design and waste disposal all became regulated as potentially harmful activities because of their ability to offend the senses. The second section gives an overview of the sanitary infrastructures that became standard in medieval urban areas. The third section surveys the control mechanisms for enforcing sanitary standards for roads, waterways and waste disposal sites. The focus is on local-level governance including statutes, court records and other administrative documents after 1300 in England and Italy, where the majority of scholarly work on sanitation has been published, with supporting information from elsewhere including France, the Nordic countries, the Low Countries and Central Europe.

Working with medieval sources to explore urban sanitation has some inherent limitations. Urban governments became powerful civic authorities in the late medieval period, generating legal documents that provide contemporary evidence about responses to environmental problems. However, care must be taken when interpreting them as social and cultural historical sources for several reasons. First, although the availability of written sources increases dramatically after 1350, the records are still spotty and give us only small glimpses into medieval life in each city. That limitation necessitates combining evidence from various cities, as well as supplementing historical documents with archaeological evidence of physical infrastructures and waste disposal practices.

Second, regulations are promulgated by authorities, whose views may not necessarily be representative of the urban population. As a judicial body, medieval civic councils heard misdemeanour presentments, levied fines, and received capital pledges for minor offences. In the legislative arena, councils issued ordinances founded on bills presented by any individual or group who wished to voice a grievance or amend common practice. The voices heard in these documents are thus only those who either chose to complain about current conditions or those who had complaints levied against them. Because these sources come from litigation, there is always a question as to whether the sanitation deficiencies they describe are the norm or the exception. I take the view that they are exceptions – that laws and fines for sanitation misdeeds document what is considered generally unacceptable to the community at large. This interpretation is backed up in the seminal work of Marjorie McIntosh (1998) who found that crime reporting in England from 1370 to 1600 came from community members rather than top-down regulation.

The sanitary condition of medieval towns and cities has attracted a fair amount of scholarly attention in the last decade – work that revives and revises often-overlooked scholarship on the history of medieval sanitation in the early twentieth century (Thorndike 1928; Sabine 1933, 1934, 1937). This historical scholarship has been framed within the fields of either urban environmental

history (Magnusson 2013) or public health history (Geltner 2012). The historical situation in England has been most extensively written on (Rawcliffe 2013a, 2013b), including analysis of sanitation infrastructure, governmental structures, and pollution control (Carr 2008; Jørgensen 2008, 2010a, 2010b; Ciecieszki 2013). Guy Geltner (2013, 2014) has offered several in-depth examinations of Italian city state governmental functions targeting sanitation offences in the name of public health. Although most of this work is based on textual records, some scholarship has integrated archaeological evidence to support the documentary records (Jørgensen 2008; van Oosten 2016). Literary scholars have also used medieval fiction to discuss the cultural place of filth (Morrison 2008; Bayless 2012). In general, current historical scholarship is countering claims made in the late twentieth century that the medieval urban environment was overwhelmingly filthy (e.g. Keene 1982; Zupko and Laures 1996).

The recent proliferation of studies of the medieval urban environment is part and parcel of a larger movement that has established urban environmental history as a defined research field, following in the footsteps of the American scholars Martin Melosi, Joel Tarr, and William Cronon who published key urban history works in the late 1990s (Frioux 2012). Recent interest in the medieval environment as an object of study has been strong in the English-speaking academic community, which has resulted in more studies of medieval England than elsewhere. As urban environmental history grows, we can expect more and more studies in other parts of Europe that would add to our source base, such as a recent Masters dissertation by Carr-Riegel (2016) on medieval Krakow's urban environmental issues, and a PhD thesis by Coomans (2018) on sanitation in the late medieval Low Countries.

Beyond the history discipline, archaeologists have been interested in medieval sanitation infrastructure for many years (Addyman 1989; Gläser 2004), including waste disposal practices (Keene 1982; Hooper 2006). Newer developments in environmental archaeology and archaeological-based disease investigation have spurred significant studies to identify internal and external parasites and diseases passed on through poor sanitary measures in medieval populations (e.g. King and Henderson 2014; Mitchell 2015a, 2015b). These studies show that while medieval governments and urban residents might have implemented sanitary controls, as will be discussed in this chapter, it does not mean that illnesses associated with poor cleanliness disappeared. Living in close proximity to animals and their wastes, eating food that lacked refrigeration and potentially improper preservation and drinking water taken from sources that could have faecal contamination without physical signs of degradation all contributed to ongoing struggles for public health. But critically, the continued existence of sanitation-related disease does not mean that sanitation ideas were absent in the medieval city.

THE SENSORY PERCEPTION OF MATTER OUT OF PLACE

The anthropologist Mary Douglas (1969) famously defined uncleanliness or pollution as ‘matter out of place’. A question that always arises, then, is why and how something is defined as ‘out of place’. For modern health science, bacteria, viruses, environmental contaminants, and rogue human cells (in the case of cancer) are out of place – they are the agents of illness. Without knowledge of the microscopic, medieval people also developed ideas of what was out of place, but this relied on a different epistemology of illness. Within the realm of city sanitation, odoriferous and visible materials were identified as harmful because they could be sensed (Jørgensen 2013a).

In European Antiquity and the Middle Ages, sensory perception was understood by learned scholars as a form of transmission of information about an object as well as its tangible and even intangible properties (Woolgar 2006). The senses served as conduits of physical contact: eyes received/transmitted light and representations of the original object, noses channelled vapours into the brain, ears carried air that had been struck and tongues and hands gained impressions of the object through touching. Bartholomew the Englishman’s thirteenth-century encyclopedia *De proprietatibus rerum* stated that the physical senses (which were ranked in importance from top to bottom in the body as sight, hearing, smell, taste and touch) relayed the tangible and intangible properties of objects to ‘the common sense’ portion of the brain (Woolgar 2006). This was particularly the case for smell and taste, since the matters sensed by the body were composed of the four elements (fire, water, earth and air) and these elements affected the four related humours; the body would react to them based on the person’s individual humours.

More than just a scholarly exercise, sensory perception of urban spaces affects how residents responded to objects and conditions they encounter. As Emily Cockayne (2007) has shown for seventeenth-century England, people became uncomfortable with other people’s practices and things when they impinged upon their senses negatively. The natural reaction was then to attempt to control or remove the offense. Unsanitary conditions were sensed primarily through the nose. Organic wastes – specifically wastes that come from decaying body parts, decomposing vegetation, feces, and urine – are highly odoriferous and do indeed carry many potential pathogens. Modern research indicates that there is a fairly consistent dislike of bodily fluid odours across human cultures, which may be linked to an evolutionary response to avoid disease (Curtis and Birna 2001). So, while interpretation of smell is certainly culturally situated (e.g. Drobnick 2006), associating organic waste odours with disease may be a typical human response.

For medical practitioners in the Middle Ages, medieval miasmatic theory attributed disease to the corruption of air, which could be visible like a fog or

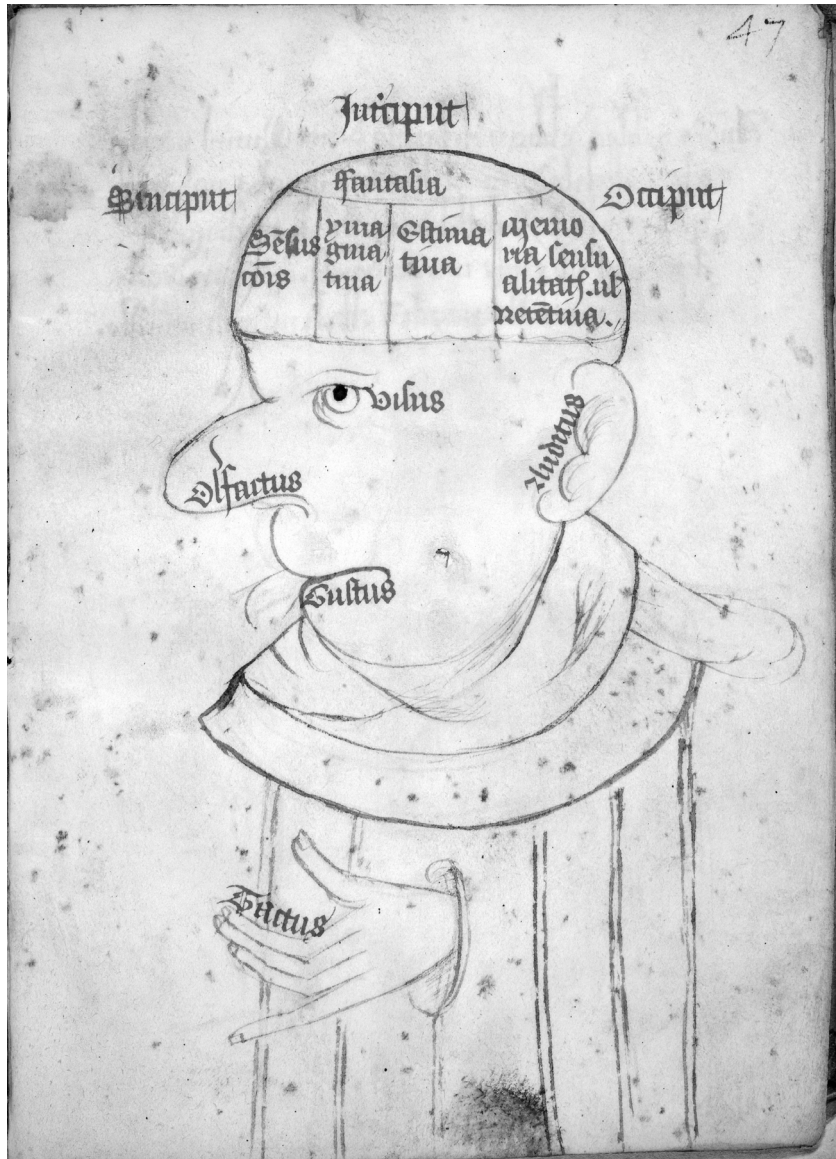


FIGURE 1.1: Augustine, *De spiritu et anima* (early-thirteenth century). Trinity College Cambridge MS O.7.16, fol. 47. Credit: Master and Fellows of Trinity College Cambridge.

invisible. Aristotelian philosophy held that odour was an immaterial quality that radiated from an object; whereas Bartholomew and his eleventh-century predecessor Constantine the African aligned themselves with Platonic thought that smell was a smoke or vapour (Woolgar 2006). Miasmas, based on the Greek word meaning pollution, were corrupting influences that needed to be avoided

if possible. These bad smells could potentially be countered by good smells from herbs, incense or flowers, which promoted the building of enclosed gardens and perfume trades (Woolgar 2006). Miasmatic theory has been widely embraced as the root of modern sanitation measures in the West (Melosi 2000). Edwin Chadwick, the secretary of England's Poor Law Commission, who is credited with initiating the modern sanitation movement in the 1840s, claimed that 'all smell is disease', placing him squarely in a miasmatic world (Reinarz 2014).

Corruption of the air was a typical late-medieval urban complaint (Robinson 2020). The obsession with stench as the source of harmful air would continue through the early modern period (Dobson 1997). Medieval sources often characterize the harmful nature of organic, decaying matter as stinking (*fetida*), rotting (*putrida*), or poisoning (*corrumpitur*), invoking the sense of smell as the mode of understanding pollution. Thus, the medieval medical poem *Regimen Sanitatis Salernitanum* (Salernitan Regimen of Health) encouraged readers to keep the air free of the smell of excrement: '*Aer sit mundus, habitabilis ac luminosus, nec sit infectus, nec olens foetore cloacae*' which can be literally translated as 'Let the air be pure, clear, and bright, / and let it be neither infectious nor odorous with the stink of the sewer' (Ordonaux 1870: 56).

Complaints were often based on organic wastes that had been disposed of directly on the ground, rather than being buried or otherwise controlled, ~~that~~ emitted strong smells. For example, in a case brought before the Norwich leet court in 1288, a man named Roger Benjamin paid a two shilling fine for setting up a muck-heap in which he buried butchery waste causing the air to be 'abominably corrupted' (Latin: *aer pessime corrumpitur*). Similar wording was used in another case that same year when William the skinner was fined for throwing dead cats into a pit whereby '*aer corrumpitur*' (Hudson 1892: 23). In November 1372, King Edward III of England commanded the local government of Gloucester to keep an area near the castle door free from animal dung heaps because: 'the air is so corrupted and infected that the constable and his household and other passers by are assailed by an abominable stench, the advantage of fresh air is prevented, the condition of the men is harmed' (Deputy Keeper of the Records 1914: 243).

Although the coming of the Black Death to Europe in 1348–49 affected European life tremendously, sanitary concerns appear consistently both before and after the event. Records from up to a century before the plague reveal that the smell of waste was considered to corrupt the air. Research on London (Jørgensen 2014) and ~~Lucca~~ (Geltner 2013) both show that regulations were in place, court cases were heard, and practical actions were taken to ensure sanitary conditions before the plague appeared. The same type of language is used throughout the period even after the outbreak of the disease with no significant changes in the framing of pollution. While it is true that medicinal tracts from the Middle Ages, particularly those written about plague prevention in southern Europe, highlight

the role of miasmas, tracts fail to directly link waste or other sanitation concerns 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' (Osheim 1994). The Pistoia ordinances also banned butchers from having a shop near any kind of tavern, shop, stable, or pen that 'give off a putrid smell', presumably to ensure the quality of the meat, although there is not any direct mention of wastes from these locations. In London, the return of the plague in 1391 appears to have prompted protests against butchery practices which were deemed to be infecting the air (Sabine 1933). While this could be read to mean that the plague brought about a change in thinking about sanitation and smell, we must remember that in 1343, before any outbreak of plague, the London authorities had named a spot for the butchers to dispose of waste for 'the decency and cleanliness of the city' (Sabine 1933: 343). Although some outcries for sanitation can have been prompted by particular outbreaks of disease, the fear of spreading the plague does not appear to have significantly changed the practical approaches to urban sanitation in the first hundred years of its appearance in Europe.

By the sixteenth century, things were somewhat different and indications are that plague outbreaks might have directly motivated sanitation actions. Thomas More, the author of *Utopia*, was Commissioner of the Sewers from 1515 and in 1518 was asked to enforce the first English royal plague orders (Totaro 2005: 72). Although those orders focused on crowd control and reducing contact with the dead, the link between More's two tasks was no coincidence. Writing in 1596, John Harington noted that urbanization led to 'infection', particularly because of latrines and human faeces, and was thus interested in designing and installing flush toilets (Jørgensen 2010c: 7).

Creating stagnant water bodies, particularly when combined with waste disposal in those wetted areas, was portrayed in texts as dangerous to health. Stench (*fetor*), for example, was said to emanate from a blocked drain in Bologna in 1376 (Geltner 2014: 315). An extended investigation of the danger of odours from a contaminated river occurred in Coventry, England, in 1480. The Prior of Coventry sent a letter to the city council complaining that the city dwellers were regularly throwing household waste and stable dung into the river so that a stench, or an 'evell eyre' as he labelled it, made 'he, his Brethern & all other ffolkes there be hurte' (Harris 1907–1913: 445). The Prior argued that waste disposal of this sort was against the law. The Mayor and council made an official reply to the Prior's complaint, noting that the council was doing everything in its power to identify and punish waste disposal violations like the one the Prior brought forward. The council noted that each time the Leet court, which handled nuisance complaints, met in the city, it included inquiries about waste disposal into the river. In addition, the Aldermen of each ward made a daily search of the

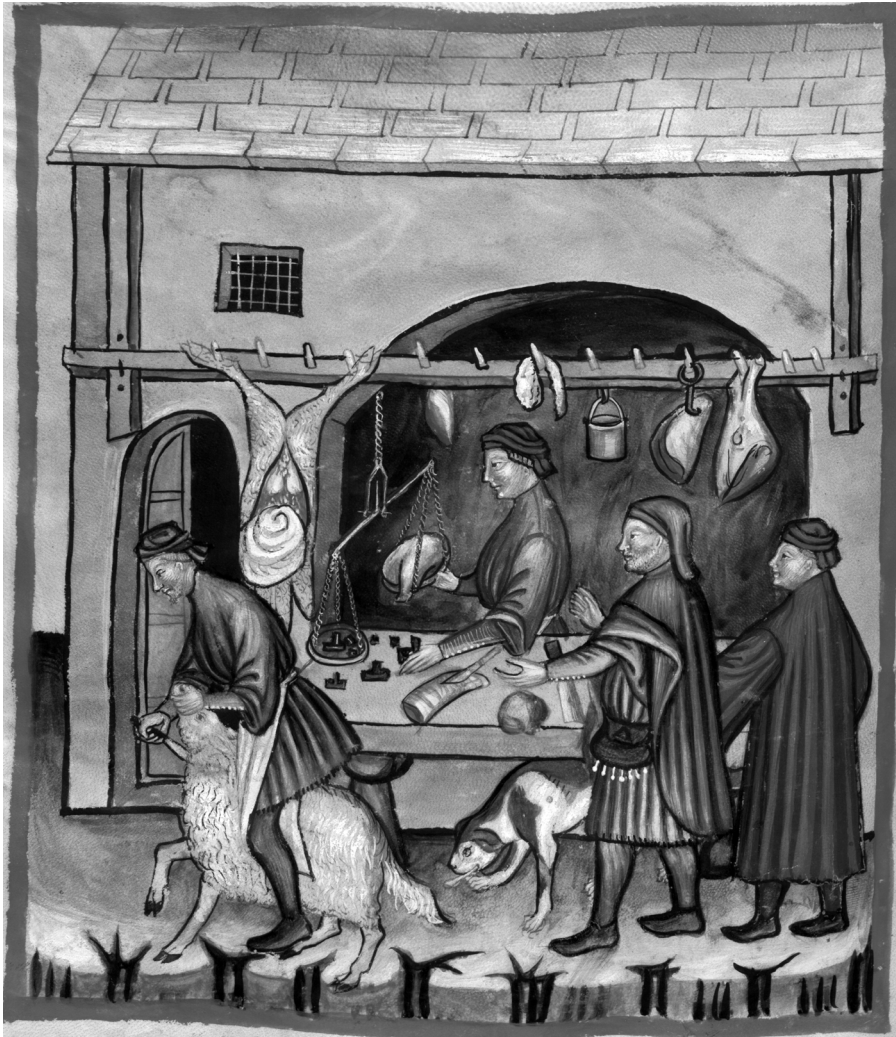


FIGURE 1.2: Sheep butchery, *Tacuinum sanitatis* (Tables of Health) (late-fourteenth century), Vienna, Österreichische Nationalbibliothek, Codex Vindobonensis Series Nova 2644, fol. 72v. Credit: Getty Images.

property adjoining the river. But although the council was working with great diligence to find people throwing filth into the river, few specific offenders could be identified, so cleaning up the smelly problem proved difficult.

Butchery wastes could be particularly troublesome for creating odours if they were disposed of incorrectly (Sabine 1933; Carr 2008). The case of the butchers of London is instructive in this regard. In 1368, the Mayor and Aldermen of London held an inquest into the disposal of butchery waste in the Thames

‘whereby the water was rendered corrupt and generated fetid smells’. As also discussed further below by Kathleen Walker-Meikle in her chapter on animals, the jury found that the butchers of St Nicholas Shambles were disposing of waste in the Thames, so they recommended the relocation of all animal slaughter outside the city walls. In 1371, the issue was still ongoing and the butchers were still disposing of carcasses in the river. The King ordered London’s mayor to remove the ‘Butchers’ Bridge’ where the butchers regularly threw offal into the Thames because of ‘the corruption, the greivous stench and the loathsome sight’ of the waste disposal practices. In a follow-up statement ordering the cessation of the butchery disposal practices the King made it clear that the waste was causing smells which, in turn, were causing illness:

Whereas of late, by reason of the slaughtering of great beasts in the city aforesaid, from the putrefied blood of which running in the streets, and the entrails thereof thrown into the water of Thames, the air in the same city has been greatly corrupted and infected, and whereby the worst of abominations and stenches have been generated, and sicknesses and many other maladies have befallen persons dwelling in the same city.

—Riley 1868: 356

In this case, animal blood and entrails, particularly when disposed of in water, were blamed for corruption of the air through smell. It is interesting to note that corruption of the water itself – water that otherwise might be consumed as drinking water or in other products such as beer – was not a concern. The air as a primary disease vector appears to have been most worrisome to the London city leaders, although sight of the bloody carcasses and dirty entrails does also appear in the complaint. The same focus on air is evident when King Charles VI of France ordered the demolition of the meat market near his palace in Paris because of ‘the corruption and infection of the air and the harm to the human body’ (de Lespinasse 1886: 275).

Other craftspeople working with organic materials including tanners, candlemakers, and leatherworkers were also singled out as culprits creating foul smells (Leguay 1999: 54). Tanners, for example, used bird guano, dog dung, oak bark and urine in their processes, creating stinking wastewaters (Jørgensen 2010b). In Nottingham, England, the local court noted that the city’s professional dyers were harming ‘the common people with the stench from the residues of their waters dropping and falling on the King’s highway’ and that the dye wastewaters caused ‘corruption of the whole people passing’ (Corporation of Nottingham 1882: 273, 275).

Latrine pits emitted strong faecal odors as the waste decomposed, and complaints about the potential danger of these odors also appear in the medieval record. Latrine nuisances in Lucca and Bologna, Italy were described as ‘putrid’

and 'fetid' (Geltner 2013, 2014), an indication that odour was the chief worry. In 1487, when the city of Malmö was granted privileges as a Danish town, the law stated that latrines had to be dug into the ground such that wastes did not flow out and spread a 'bad smell' over the streets and neighbouring plots (Anders 1986: 265). London court records give an indication of the type of complaints that arose. In 1341, the London Assize of Nuisance investigated odours entering the house of a widow named Isabel from her neighbour Henry's cesspit (Chew and Kellaway 1973: Misc. Roll DD, no. 365). The smell was wafting through a window and several smaller openings into her tenement. Henry was ordered to remove the nuisance. In 1355, there were complaints about the degraded state of the ditch surrounding the Fleet Prison in London affecting the prisoners (Riley 1868: 279–280). Waste from latrines directly built over the ditch as well as tanning waste was causing an 'infection of the air'. The result of this 'abominable stench' was that 'many of those there imprisoned are often affected with various diseases and grievous maladies, not without serious peril unto them'. Concern about the sanitary condition of the Fleet River had even appeared the year before, in 1354, when butchery waste dumped in the Fleet was also blamed for odours harming the health of the prisoners (Sharpe 1905: fol. xxviii). All this evidence indicates that the smell from both solid and liquid organic waste materials was understood in the Middle Ages to be generally unhealthy.

Sight should, however, not be dismissed as a motivator for identifying unhealthy situations in the medieval city. As noted in the case of the London butchers and the Thames, the sight of the butchery offal was also singled out as a concern. A similar conjunction of smell and sight appeared in a complaint by the Friars Minor in York, England, in 1372 (Deputy Keeper of the Records 1911: 438). The air takes centre stage in their grievance in which the friars noted that '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 their other houses, and flies and other vermin are thereby bred and enter their church and houses'. But they also mention that the parishioners refused to attend mass because of both 'the stench and the horrible sights'. The remedy commanded by the King of England was to dispose of the waste where it could be 'covered up' – a fix that addressed both the smell and sight problem. Town statutes often forbade butchers from having visual signs of contamination. For example, in Seni, Croatia, butchers could not have unfinished skins hanging outside their shops (Azman et al. 2006) and in Coventry, England, butchers had to keep their doors clean of 'bloode and other fylthis' (Harris 1907–1913: 42–3).

It is possible that optical theories of intromission, in which the eye can absorb an object's qualities, played a part in wanting to avoid seeing waste (Geltner 2013: 10; Geltner 2014: 315). In the theory of intromission, the object gives off a light, which is transmitted to the eye through a process of replication of the original as a likeness or representation (Woolgar 2006: 21).

In this theory, the visible object has tangible contact with the eye and can change the essence of the soul through that contact. This led to the belief that the sight of a thing could physically affect the viewer. Yet even without invoking optical disease transmission, visual evidence of waste was a sure way to identify where a potentially lethal smell was coming from.

Taste could also have played a role in identifying the unclean, especially as the sense of taste is closely related to smell. A Parisian ordinance from 1374 declared food inedible if it was around waste of any kind, and the quality of water in drinking fountains in Paris was said to be questionable because of contact with waste (Leguay 1999: 44). In other instances, blood and butchery waste show up as direct agents of water pollution. In fourteenth-century Lucca, Italy, for example, allowing animal blood to flow into a public space was punishable by a fine; and slaughtering animals above a well or washing them near a well was forbidden (Geltner 2013). This restriction likely had to do with the potential for the blood to make the water undrinkable. The same concern holds true for a regulation in Narbonne, France, from 1315 which forbade the dyers of the city from disposing of their foul-smelling blue or red madder into the water except in the early evening so that the water would be drinkable in the morning (Leguay 1999: 58). The same kind of nighttime-only disposal regulation for blue madder was passed in Winchester, England (Bailey 1856: 97–8) and for tanners' waste in Verona (Zupko and Laues 1996: 82). Food hygiene could also be directly affected by waste disposal – for instance, the York government banned the washing of tanned skins in the area of the riverfront where the butchers prepared sausages (Sellers 1912–15, 1: 15).

INFRASTRUCTURE FOR SANITATION

The concerns about sensing waste material led medieval town governments to regulate the building of sanitation infrastructure. These developments appear in many different locales at roughly the same time in the city records. This congruence of approaches to sanitation issues is likely the result of similar population pressures in the rapidly urbanizing cities of the fourteenth century and the availability of a common set of tools and management techniques. As urban populations grew in the Middle Ages, local governments became more vested in maintaining peace among neighbours which, in turn, required legally defining what constituted nuisance behaviours and what building standards should be followed. The growth of sanitation infrastructure as instruments of enforcement is part and parcel of the growth of the power of urban governments (Jørgensen 2010a).

However, we should be wary of attributing too much novelty to medieval building rules and nuisance law that are first recorded in great numbers in the fourteenth century – it may be that some of the regulations were common practice

before the late medieval period, but are only recorded in writing because city-level records were becoming more systematized and complete. For example, local sanitation-related ordinances are recorded in the 1200s in several Italian cities, including Bassano in 1259, Verona in 1276, Ferrara in 1287 and Spoleto in 1296 (Zupko and Laures 1996). On the other side of Europe, the Scottish Statutes of the Guild, originally adopted in Berwick in 1249, levied a fine against anyone putting filth or household ashes into the street, marketplace, or river bank (Innes 1868: 72). Yet the number of surviving documents certainly proliferates over time; by the fifteenth century, sanitation issues are regularly recorded in urban records.

Infrastructure standards for latrine construction were set up in many cities. General city laws regulated where latrines, privies and cesspits could be located, often in reference to the homeowner's property line. The German Magdeburg civic law code, first compiled in 1188, specified that cesspits had to be three feet away from the property fence and had to be enclosed (Carr-Riegel 2016: 49). A 1269 city law from Ribe, Denmark, required latrines to be built at least fourteen feet from cemeteries, at least ten feet from the nearest street and at least six feet from the nearest neighbour (Økland and Høiaas 2000: 9). The 1487 city privileges of Bergen, Norway, stated that latrines had to be at least two feet from the street and neighbouring property and could not have an overflow (Økland and Høiaas 2000: 10). Regulations passed in 1463 and 1464

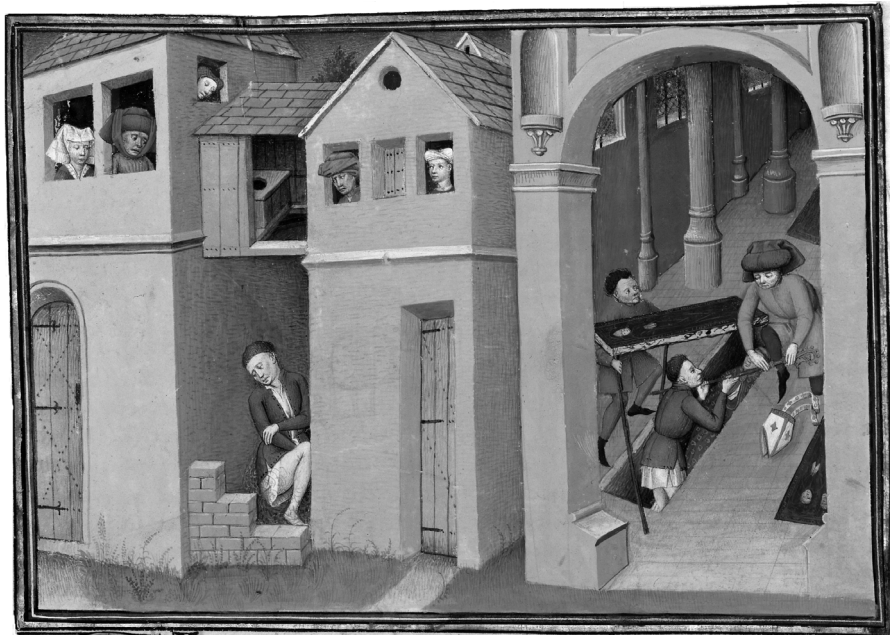



FIGURE 1.3: Boccaccio, *Decameron* (mid-fifteenth century). Paris, Bibliothèque de l'Arsenal, MS 5070 réserve, fol. 50v. Credit: Bibliothèque Nationale de France.

in Leiden, Netherlands, mandated the provision of cesspits for all tenants and prohibited drainage of cesspits into overflows or canals (van Oosten 2016: 712). In Bologna, five men who had open latrines in 1295 were ordered to close them off from those passing by (Geltner 2018).

Some cities provided city-owned and operated latrines, which were often strategically placed in market areas which had many visitors. For example, the York government owned and maintained public latrines in an arch of the bridge over the river Ouse below the *maison dieu* in 1367. In 1400, the Ouse Bridge financial records attest to the city paying 13s 8d for its annual maintenance, in addition to repair works that had to be undertaken from time to time (Stell 2003: 122, 208, 257). Several entries in the bridgemaister's accounts indicate that the city paid 6s 4d annually for oil to light the latrines at night, a move that would have made using a damp, dingy public latrine more comfortable. 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 1934: 307). In fact, medieval London had at least thirteen public latrines; often these were latrine complexes that could accommodate many simultaneous users (Sabine 1934: 309).

Waste collection services were publicly organized. Collecting taxes to provide a public service may seem like a relatively new development, yet medieval governments collected taxes to build and maintain sanitary system infrastructure (Jørgensen 2008). In Coventry, for example, waste collection services are recorded in 1420 when the council gave William Oteley the right to collect one penny from every resident and shopholder on a quarterly basis for his weekly street cleansing and waste removal services (Harris 1907–1913: 21). The constable of each ward had to ensure that a weekly cart service was provided. The cart service appears to have made regular rounds every Saturday, as inhabitants were told to put out their muck and sweepings only on a Friday night because the cart would come the next morning. Many cities appear to have had similar systems. York had a dung cart 'in every ward and a place assigned without the barre or postern wher al such dung as shalbe caried out of every ward shalbe layd so that husbands of the contre may come ther to and have it away' (Raine 1940: 165). The city of Norwich had two public carts for the removal of 'ffilthie and vile matter' (Hudson and Tingey 1908–10: 2: 110) and [O] also paid John the Common Sergeant for cleansing the common marketplace several times and Austyn Bange for carrying muck out of the city-run lepers' house (Hudson and Tingey 1908–10: 2: 53, 61).

 The waste collection services were intended to pick up waste from the streets and the gutters before they could begin to smell strongly. Weekly service helped promote prompt removal.

Paved streets and drainage gutters also served as sanitary infrastructures (Jørgensen 2008). Streets paved with stones with some kind of drainage gutter



FIGURE 1.4: Nuremberg Hausbuch (mid-fifteenth century). Nuremberg, Stadtbibliothek Nürnberg, MS Amb. 317.2°, fol. 77. Credit: Stadtbibliothek Nürnberg.

in the middle ~~are~~ common in many medieval towns and cities. For example, Siena, Italy, mandated paving both streets and alleyways in 1262 to avoid mud accumulating in the streets (Armstrong 1900). Professional pavers who were often employed to maintain the paving of major thoroughfares and markets appear in medieval budgetary records, such as in Krakow, Poland, where payments are attested from 1390 onwards (Carr-Riegel 2016: 24). Pavement and gutters would have facilitated runoff from the street, avoiding the accumulation of mud and stagnant water, which would have been seen as unhealthy. Street sweepers appear to have been employed by some city governments: Coventry paid for cleaning of the marketplace (Harris 1907–1913: 217), Norwich appointed two people in each ward to clean the streets in 1496 (Hudson and Tingey 1908–10: 1: 288), and London had designated street cleaners called ‘rakiers’ (Sharpe 1909: fol. cxliv). Street cleaners probably came from the lowest classes: in Central European records, hired street cleaners were often vagrants, paupers, and prisoners (Havlíček et al. 2017: 273).

ENFORCEMENT OF SANITATION

Building infrastructure to minimize odoriferous wastes, and thereby remove matter that was dangerous to health, was only the first step toward *sanitas* in the medieval city. The use of those infrastructures also had to be enforced. Records indicating how sanitation was enforced come in two varieties: laws or statutes that promulgate standards and set up fines for disobedience, and court records indicating inspections carried out, cases heard and fines levied. While repeated promulgation of statutes has been read by some scholars to indicate systematic failure of the legal system to keep the medieval city clean (Zupko and Laures, 1996), more recent work has seen the reissuance of sanitary laws as an indication that sanitary violations were seen as socially unacceptable (Jørgensen 2008; Rawcliffe 2013; Geltner 2014). It may be that most provisions were written down in response to a specific petition or nuisance, rather than being formulated as a pre-emptive general law, as Kucher (2005: 512) argues for regulations in Siena. As Martha Howell remarked, social legislation assisted in defining medieval city spaces as ‘clean, pure, open, propertied, risk-limited, peaceful’ (2000: 17).

City sanitation statutes tend to be negative (‘thou shalt not’) proclamations: waste should not be disposed of in the street or gutter, on a neighbouring property, or in the river, and latrines should not leak. These proclamations tend to attach some kind of fine to the forbidden activity, such as Magnus Eriksson’s Swedish city law of 1353 which levied a six-mark fine for building a latrine closer than three feet from the property line (Holmsbäck and Wessen 1966) or an order from Coventry in 1444 that no manure was to be swept into the gutter or the perpetrator would receive a 4d- fine (Harris 1907–1913: 208).

There are also positive, actionable laws that address how often to clean the streets, where to take waste for disposal, and how to report sanitary violators. In Krakow, for example, a statute on road cleaning from 1373 required that residents had to sweep the street clean up to the road's central gutter within a certain distance from their door (Carr-Riegel 2016: 43). Such a command was designed to make sure that the street cleaning labour would be divided between the residents, a common feature of medieval sanitation control (Jørgensen 2008).

Specific job titles were designated for sanitation duties in the medieval city (Jørgensen 2010a). In the late thirteenth century, London had four men in each ward jurisdiction designated to keep up the pavements, remove obstructions such as dung in the street and levy non-compliance fines (Sharpe 1899: fol. 88b). These men were collectively known as 'scavengers' or 'rakers' (Sharpe 1905: fol. clxv). In Bologna, the *fango* notary was the official in charge of all 'dirt'-related things from 1256 (Geltner 2014). The *fango* notary performed inspections, noting both compliance and non-compliance with sanitation rules affecting waterways, streets, ditches, bridges and pavements. The oath of parish representatives in 1288 included reporting:

filth and wells that are not cleaned and lack chains and buckets, or if the latter are broken; and those keeping un-walled ditches; and those who throw feces or dung in public roads; or those cooking fat or grease, during the day or the night, in that parish or neighborhood; and those burying bones or having them buried in the city or rural settlements of Bologna; and those placing or leaving cloths to soften in a non-draining ditch; [. . .] and those having clogged ditches; and those throwing dung or carcasses into public ditches or who keep buckets or any other vessel containing putrid or otherwise dangerous matter.

—Geltner 2014: 314

In Coventry, the sergeant served as the primary officer enforcing waste laws through the 1400s (Harris 1907–1913: 91). The sergeant had the responsibility to search for people throwing waste into the river or heaping it up at one of the city's market crosses and to inspect a large city ditch for illegal latrines. The sergeant organized the removal of waste piles with city funds, found labourers to clean the 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.

There are court records indicating some level of sanitary enforcement. Lucca's *Curia viarum* and London's Assize of Nuisance both fined people for unsanitary acts such as improper waste disposal, damage to waterways and failing to construct approved latrines (Geltner 2013). The Assize of Nuisance,

which dealt primarily with building law, recorded 24 cases dealing with latrine construction or placement in the period 1301 to 1346 (Jørgensen 2015: 227). These complaints typically focused on smelly or leaking latrines that neighbours considered a nuisance. The court officials heard evidence about the latrines and often visited the site before issuing the judgment, which often ordered repairs or the removal of the latrine. The *Curia viarum* records, as well as those of similar offices in other Italian cities, give detailed insights into enforcement by recording the proceedings of the court, outcomes of hearings and financial data, which all show a concerted effort to maintain a clean city (Geltner 2019b). The *conconc der ribauden* in Ghent likewise managed a wide range of sanitary issues, from waste disposal to keeping pigs off the streets (Coomans 2019). The scope of sanitary enforcement is also evident in the court records for Nottingham, England, in 1395, which cited 33 offenders of sanitary violations (Corporation of Nottingham 1882: 268–83). These included three men who threw dung into the Saturday marketplace, a woman who threw dung into a ditch, a group of dyers who emptied out their dyeing water into the street, and a butcher who blocked up a lane with blood and entrails. Norwich's Leet also levied fines for throwing waste in the river (Jørgensen 2010b).

CONCLUSION: CLEANLINESS AND HEALTHINESS

As this chapter demonstrates, uncleanliness in the medieval urban space was defined by what a person could see or smell. Strong odours from decomposing organic material were shunned as dangerous under the prevailing miasmatic disease theory. This meant that bulky and organic waste such as butchery offal, latrine excrement, animal manure and tannery liquids were common targets of sanitary controls. In general, the laws and their enforcers attempted to get these kinds of wastes off the streets and into contained disposal or reuse locations. Legal structures that prevailed in Europe considered public spaces as public goods (Howell 2000), so sanitation restrictions in streets, markets and waterways was a natural development. Clean streets became a civic virtue because it made citizens healthier and the city more beautiful (Kucher 2005). Violation of sanitary norms was not considered acceptable behaviour. On top of regulations, city governments established and maintained public works, including paved roads, weekly trash carts and common latrines, to minimize urban dirt. While this means that medieval streets were not filled to the brim with waste, the health of the urban dwellers was probably still affected by what are today considered diseases linked to poor sanitation. Contact with excrement was commonplace – daily city life included hauling manure, cleaning animal intestines and industrial processes such as dyeing and tanning that used both faeces and urine as ingredients. All of these were potential pathogen sources. Latrines, while generally not leaking onto the street, could be leaking bacteria

into groundwater sources, something which the medieval residents had no way of knowing. In addition, houses tended to be damp and have little airflow, increasing the likelihood of respiratory infections. This means that medieval notions of sanitation – removing those things with strong decomposition odours from under one's nose – did not always equate to healthiness. What was sensed in the medieval environment as matter out place was controlled, but it was not necessarily the only unhealthy thing in the city.