



The Stench of Disease:

Public Health and the Environment in Late-Medieval English towns and cities

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Abstract

This article explores the urban environmental concerns of late-medieval English towns and cities and argues that these urban areas had a form of public health. During this period, regulations that focused on maintaining the good health of town and city inhabitants were created and enforced. Among other things, these regulations focused on reducing unsanitary trade practices, protecting water sources, eliminating foul smells from the air, and preventing the consumption of bad food and water. They also represented a practical application of medieval theories and perceptions of disease—namely that disease was linked to bad smells. Rather than lacking any form of public health due to medieval theories of disease, they actively pursued it due to the ancient and medieval link between environmental health and physical health.

Keywords: *medieval; Public Health; urban; Environment; disease*

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1. Introduction

To the mayor and bailiffs of York, The king, detesting the abominable smell abounding in the said city more than in any other city of the realm from dung and manure and other filth and dirt wherewith the streets and lanes are filled and obstructed, and wishing to provide for the protection of the health of the inhabitants and of those coming to the present parliament, orders them to cause all the streets and lanes of the city to be cleansed from such filth before St. Andrew next, and to be kept clean.... (Lyte, 1898, membrane 9d)

This quote from 1332 highlights not only a few causes of bad smells within medieval English towns and cities, but also a central concern for eliminating those smells and keeping the urban environment clean—that they could affect the health of urban inhabitants. Naturally, the practical reason of keeping the streets and walkways passable, as well as the pure discomfort that many citizens experienced from horrible smells, also stimulated the creation and enforcement of city-cleaning regulations. However, the concern that a filthy, smelly city could lead to bad health was a prominent motivational factor behind most of these regulations. Medieval citizens cared about urban cleanliness due to their environmentally-based understanding of disease that focused mainly on the smell of the air and water. Urban sanitation and hygiene represented a practical application of medieval theories of disease that urban authorities implemented and enforced through legal means. Medieval medical theories led to environmental regulations and concerns about the cleanliness and health of the medieval urban space.

This study focuses specifically on English towns and cities from the thirteenth to the fifteenth century, including London, York, Coventry, Salisbury, and Leicester. The sources most useful to this study have been legal and administrative records, as well as ancient and contemporary medical sources. As shown in the discussion below, other studies have focused on examining environmental and city-cleaning regulations in medieval cities, including legal, administrative, and technological approaches that focus on the infrastructure of medieval sanitation—mainly, what technologies were in place to handle urban waste during this period and what laws and management techniques were applied to coordinate and handle the disposal of medieval urban waste and the cleansing of medieval streets. Many historians have mentioned that bad-smelling air was connected to disease in the medieval mind, and thus represented one motivation for urban cleanliness, but none have analyzed the evidence from a medical history perspective. This study aims to fill that gap and argues that medieval public health does indeed have a place within the historiography of the broader public health topic.

The general study of medieval environmental history is nothing new. In the early twentieth century, Lynn Thorndike (1928) published “Sanitation, Baths, and Street-Cleaning in the Middle Ages and Renaissance,” arguing emphatically that the foul conditions of medieval cities have been greatly exaggerated. He suspected that this

prejudice was due to a progressive interpretation of history, that if modern cities suffer from a lack of sanitation and cleanliness, surely medieval cities must have been much worse.

In the 1930s, Ernest L. Sabine published three articles that focused on the environmental regulations of medieval London: “Latrines and Cesspools of Mediaeval London” (1934), “City Cleaning in Mediaeval London” (1937), and “Butchering in Mediaeval London” (1933). In these articles, Sabine argued that medieval Londoners had some concept of environmental concern beyond preconceived notions that medieval people had no qualms about living in filth and disarray. His article on city cleaning emphasized this point most clearly. The London mayor, aldermen, and councilors appointed scavengers, beatles, and rakers to clear animal waste, trash, and other nuisances and obstructions from the streets and relocate it outside of the city. Londoners were also expected to keep the area around their property maintained. Sabine did not say that Londoners always complied with city cleaning ordinances, or that medieval standards of cleanliness were commensurate to modern standards, but he demonstrated that they did have these concerns and tried to regulate their environment with a basic sanitary system and legal regulations for waste disposal.

William H. Te Brake (1975) has done some research in this area, publishing “Air Pollution and Fuel Crises in Preindustrial London, 1250-1650.” Likewise, he argued against medieval misconceptions. According to Te Brake, air pollution (as in smog, not just smell) did not originate with the industrial revolution—it existed in medieval and early modern London. Due to the common shortage, and thus high prices, of wood fuel, medieval Londoners used sea coal as a substitute. Te Brake explained that the burning of sea coal released considerably more intense clouds of smoke and fumes than the burning of wood, and thus caused many complaints, both because the smell was very unpleasant and because Londoners connected the strong odor of the smoke with their health.

In 1996, Ronald E. Zupko and Robert A. Lares published *Straws in the Wind: Medieval Urban Environmental Law, The Case of Northern Italy*. Broadly speaking, this study argues that people have been concerned about the quality of their environment for as far back as history records; specifically, they demonstrate that in medieval Italy, many regulations focused on maintaining a clean urban environment, including waste management and protecting the water, due to the desire of public officials to both protect the health of urban citizens and to master their environment. However, they also indicate that northern European cities greatly lagged behind Italy and learned from their example of municipal environmental regulations, which, as the previous studies have demonstrated, was not necessarily the case.

Recently, Dolly Jorgensen published a few articles examining city cleaning and sanitation in medieval and early modern England and Scandinavia. In “Cooperative Sanitation,” Jorgensen (2008) argues that late-medieval city-cleaning and sanitation in both English and Scandinavian cities required considerable work, including organization and management involving various social relationships and responsibilities on the part of both city government and private individuals. She focuses most heavily on Coventry for her analysis of English sanitation, but includes other urban locations as well. In both England and Scandinavia, she finds the same pattern—that the relative simplicity of medieval sanitary technologies, such as latrines and gutters, “required complicated social structures to make them work” (p. 567). In “All Good Rule of the Citee,” Jorgensen (2010) focuses mainly on Coventry and Norwich and argues that the task of sanitation began with a high degree of top-down government involvement and organization, but then witnessed a transition from 1400 to 1600 to more specialization that spread responsibility at the local level, including both specialized jobs and positions and financing to support all of the various aspects of removing waste and keeping the streets clean. This transition was necessary due to the large number of sanitary tasks that required oversight, and while these medieval cities did not establish permanent sanitary structures during the early-modern period, Jorgensen argues that their sanitary management was a precursor to permanent management structures in the modern period.

Overall, Jorgensen argues that medieval and early-modern sanitation in England comprised a variety of components, including technology, legislation, public efforts and organization from local governments, and private cooperation and responsibilities. In this study, I add that medical knowledge and understanding represented a vital component as well and contributed to the motivation for sanitary measures in English towns and cities. Due to the connection that medieval citizens and city officials made between disease and the cleanliness of the urban environment, they not only had a system of sanitation and city-cleaning for purposes of urban efficiency, but they were also concerned about maintaining this system for reasons of public health.

Understandably, the historiography of public health has been dominated by studies that focus on the modern period. The advent of modern public health has been examined in Christopher Hamlin's (1998) *Public Health and Social Justice in the Age of Chadwick*. In this work, Hamlin focuses on the beginning of modern public health in Britain in the nineteenth century. He discusses the separation between public health officials and medical professionals in nineteenth-century England. The two would eventually come together in the twentieth century, of course, but even after John Snow discovered the microscopic cause of cholera outbreaks in London's water during the 1850s, medical knowledge was not consulted when it came to developing new methods of public health at that time (Johnson, 2006). When Edwin Chadwick, a lawyer assigned to be secretary to the commission administering the new poor law, created his public health *Report on the Sanitary Condition of the Labouring Population* in 1842, he focused mainly on how sanitation could improve social conditions, not medical (Hamlin, 1998). In this context, the conditions of the poor represented the causes of disease. Returning to the medieval period, in contrast to the nineteenth-century attitude, contemporary medical theories directly informed the medieval thought process behind health-related regulations. Furthermore, nineteenth-century developments in public health do not represent the beginning of public health efforts, but a new stage in the overall history of public health in English towns and cities that can be traced back to at least the late-medieval period.

Even before the growth of modern germ theory and bacteriology, the healthy condition of the air and water in one's environment was still connected to disease prevention. Sensory perception, however, represented the primary method for determining the healthiness of the surrounding environment, and thus bad-smelling air was one factor that was readily linked to poor health. This ancient idea, called "miasma" by the ancient Greeks and advanced by the *Hippocratic Corpus*, became popular in the writings of Galen, a second-century surgeon and physician whose theories were consulted by medieval medical practitioners. Originally referring to the unhealthy smells that emanated from swamps, miasma was a popular theory of disease in the middle ages and could not only refer to bad-smelling air, but also to the bad air exhaled from a sick person, such as a leper (Adams, 1952; Brimblecombe, 1987, pp. 6-9; Brock, 1952; Rawcliffe, 1995, pp. 30-32). These early theories were combined with other medical theories and remedies contemporary to the medieval period, but the basic idea that bad air caused disease remained popular. In *De Proprietatibus Rerum (On the Properties of Things)*, twelfth-century English monk Bartholomew Anglicus writes this when referring to lepers: "The nails are boystous and bunchy, the fingers shrink and crook, the breath is corrupt, and oft whole men are infected with the stench thereof" (Clendening, 1942, p. 88). Regarding both lepers and victims of the mid-fourteenth century Black Death, there was indeed a moral component to the disease that linked it to sin and other supernatural causes; however, environmental theories were still quite popular, and this quote from the era of the Black Death illustrates the connection:

Although pestilential sicknesses can arise from a corruption of water and food, as happens in times of famine and poor productivity, nevertheless we are of the opinion that illnesses which proceed from a corruption of the air are more deadly, since this evil is more hurtful than food or drink in that its poison penetrates quickly to the heart and lungs. Moreover, we believe that the present epidemic or plague originated from air that was corrupt...for any vapors that had been corrupted at the time of the aforesaid conjunctions arose, by virtue of

their [nature], from the earth and water, and in the air were spread... (1348). (Aberth, 2005, pp. 41-43)

Human waste, animal waste, and other filth all contributed to environmental concerns in late-medieval English urban areas that were directly related to bad odors. Many trade practices also contributed to this nuisance, for example: “A complaint made to the Mayor...of noxious fumes arising from certain plumbers carrying on smelting operations in a place called ‘Wodhawe,’ in the parish of St. Clement, and proceeding thereon” (Sharpe, 1905, folio cclxxiii). However, butchering, far more than any other trade, stimulated complaints and regulations that focused on cleanliness and reducing harmful odors: “they slaughter pigs and many other animals, and the water mixed with the blood and hair of the slaughtered animals, and with other filth from the washing [of the carcasses], flows into the ditch or kennel in the street, through which it is carried into the friars’ garden, causing a stench” (Chew, 1973, p. 142). In this example from mid-fourteenth century London, smell was highlighted as the main concern, but it is unclear whether the complainers were referring to their fear of miasma or only to the general unpleasantness of the stench. However, in this example from 1354, Londoners clearly draw a connection between the smelly butchering trade and their health: “...and had let the same wharf to butchers...for the purpose of cleaning and depositing there the entrails, &c., of cattle slaughtered by them...the stench arising therefrom was so bad as to be injurious to the health of the inhabitants of the free prison of the Flete and neighbourhood... the Mayor and Sheriffs are bidden to do speedy justice touching the said wharf” (Sharpe, 1905, folio xxviii). As this complaint illustrates, Londoners believed that the stench produced by the butcher’s waste was literally a health hazard, reinforcing the connection between bad air and disease.

The records from other English cities and towns, such as this example from mid fourteenth-century Oxford, show that the smell-related complaints that surrounded the butchering trade were not restricted to London:

To the mayor and bailiffs of Oxford. Order upon sight of these presents, to cause proclamation to be made that no butchers or others shall slaughter large beasts within the walls, and that no burgesses or others shall place dung, filth, or other offal in streets, ways and lanes where there is common passage of men, or permit this to be done, but immediately the proclamation has been made, to cause those by whom such filth has been placed, to clean the ways and lanes and keep them clean, under pain of punishment, because the king has been informed that several great beasts, to wit, oxen, cows, pigs, sheep, calves and such like are daily slaughtered at divers places within the walls, and also that so much filth, dung and other offal is in the streets, ways and lanes within the walls, that the air is so infected by abominable smells that certain of the magnates and others who come to the town and the scholars and burgesses there are often detained by severe sickness and some die. (Lyte, 1900, membrane 3d)

In general, the butchers seemed to draw regulations wherever they practiced, and again the bad smells produced by the trade were connected to poor health. Furthermore, this record states that even the deaths of some individuals were blamed on the bad air. The records for Coventry, Salisbury, Lynn, Southampton, Leister, Northampton, York, and, of course, Oxford and London all contain regulations for controlling the butchers, including where they could dispose of their animal waste (Carr, 2008). The street obviously did not represent an ideal area in which to contain butchers’ waste, as previous examples have illustrated. It was a punishable offense during this period, and the offender typically had to pay a fine (Sabine, 1933). In fifteenth-century Salisbury, Butchers were ordered not to “slaughter their animals in front of Butcher Row (‘le Bocherrewe’) in the common street but behind it, because of the foulness, putrifaction, and nastiness of the [offal from] said animals” (Carr, 2001, p. 218). Also, butchers were not to “carry away the offal or intestines of their animals by day but at night” (p. 218). In addition to the obvious foulness of street defilement, a case from early fifteenth-century London pointed out that streets used as butchers’ dumping grounds were no longer passable, thus impeding city traffic as an additional nuisance (Sabine, 1933, p. 342). Most commonly though, defilement of the street occurred as a means to an end:

offal fell off of carts onto the streets during its journey to another destination (Thomas, 1929, roll A 13, membrane 6). For example, Londoners often complained about the “nuisance of butchers carrying offal, &c., through the streets to the river” (Sharpe, 1905, folio ccxlv b).

The Fleet was one waterway where butchers disposed of their refuse. In the 1340s, city authorities gave the butchers of the parish of St. Nicholas at the Shambles land adjacent to the Fleet for the purpose of cleaning and disposing entrails. In return, the butchers paid a yearly “boar’s head” to the mayor. However, by 1354, complaints about these butchers had made their way to Parliament because “...the stench arising therefrom was so bad as to be injurious to the health of the inhabitants of the free prison of the Flete and neighbourhood...” (Sharpe, 1905, folio xxviii). Consequently, authorities destroyed the Fleet wharf, forcing these butchers to find another place where they could get rid of their animal waste (Sharpe, 1904, folio lxxvii; Sharpe, 1905, folio xxviii; folio xxxvi).

London’s butchers also used the Thames as a disposal area. Most basically, butchers would throw offal into the Thames at the shore or off of docks, particularly “Butcher’s Bridge” (not literally a bridge, but more similar to a dock or pier), the cause of many complaints. A 1369 writ called for the removal of Butcher’s Bridge, and although authorities removed the structure, citizens still complained about butchers disposing of their filth into the Thames (Sharpe, 1905, folio ccxxvii b; folio ccxlv b). During the fourteenth century, several writs aimed at regulating the disposal of offal by restricting butchers to do their slaughtering outside of the city. As Ernest Sabine (1933) points out in “Butchering in Mediaeval London,” no clear evidence exists to confirm that butchers obeyed these regulations. As a final solution, a house for the use of butchers was built on the edge of the Thames, and they were allowed to dispose of offal in the river as long as they “cut up their offal and take it in boats to midstream and cast it into the water at ebb-tide” (Sharpe, 1907, folio cclxxviii b). Even though complaints about butchering activities continued throughout the fifteenth century and regular enforcement was needed, the method of disposal remained the same (Sabine, 1933, pp. 349-353).

As already indicated in the previous examples, the citizens of medieval English towns and cities connected the foul odor of the butchering trade with their health. Likewise, Sabine connects periods of plague outbreaks in London to the resurrection of complaints against butchering and the return of strict regulations against the trade. For example, he pointed out that a 1391 outbreak triggered a tightening of enforcement for butchers to only slaughter outside of the city. Aside from its wretched stench triggering fear of disease, butchering carried an additional stigma that encouraged its connection with disease and everything foul and dirty. It involved blood. In *Medieval Blood*, Bettina Bildhauer (2006) defines the shedding and touching of blood outside of the purity of the body not only as a sin or a crime, but as a form of pollution. Thus, the touching of blood was seen as impure, and anyone who did so for a living was viewed as a source of impurity (pp.66-70).

Even though practices of blood-letting indicate that there was a medical connection to regulating the health of one’s blood in the Middle Ages (Bildhauer, 2006, pp. 66-67), there is no indication that they believed that the transmission of disease could occur through blood. Rather, people feared contact with blood due to the stigma associated with its perceived impurity; any blood that was located outside of a body was a potential threat. Bildhauer builds her argument from that of Mary Douglas (2002), who argued that cultural taboos, such as the eating of pork, are not practiced out of a practical need to maintain good health and hygiene, but in order to maintain socially-constructed ideas about categories and types of behavior, and whatever violates those established categories becomes taboo. Bildhauer (2006) applies this argument to blood taboos, and thus does not argue that the avoidance of blood was based on a practical need to maintain good hygiene, but instead, because of a socially and religiously-constructed idea that blood was impure. In this example, that could have been the case: “No doctor...is to buy old bandages, save in open market and by view of his neighbors. They are to be sworn that if they find any old bandages for sale which are ripped or bloodstained, they are at once to take the vendor and bring him before the

bailiffs. If any doctor...does otherwise, he is to be taken just like a felon, murderer or redhanded thief, and sent to prison at the king's will" (Prestwich, 1976, p. 17). However, it is conceivable that since the practice of butchering produced horrible smells that were linked to disease, as demonstrated by examples from the municipal records, medieval urban citizens did associate the presence of blood with disease because it smelled bad: "the water mixed with the blood and hair of the slaughtered animals, and with other filth from the washing [of the carcasses], flows into the ditch or kennel in the street, through which it is carried into the friars' garden, causing a stench" (Chew, 1973, p. 142). They may not have believed that they could have become sick by touching blood, but certainly from the odor produced by rotting blood that contaminated the air. Furthermore, even though the impurity associated with blood was not associated with disease per se, it was still associated with environmental cleanliness, and thus reinforced the need to regulate the butchering trade for the well-being of the citizens who lived in these urban environments. The medieval association between bad smells and disease, as well as the association between blood and environmental pollution (in the form of impurity), both contributed to the need for the regulation of the butchering trade in medieval English towns and cities.

Beyond issues of bad smell and impurity, aesthetics must be considered as well. Throughout late-medieval England, the butchers' activities not only contributed to the environmental concerns presented above, but they were also an eyesore: "An inquest of office was taken before the Mayor and Aldermen to discover what persons were in the habit of throwing the offal of beasts, and other filthy and putrid matter from the slaughtering of beasts, into the Thames . . . , and likewise of carrying such offal through the lanes and streets to the aforesaid river, whereby the water was rendered corrupt and generated fetid smells, becoming an abominable sight and nuisance to all dwelling near or crossing the river (1368)" (Thomas, 1929, roll A 13, membrane 6).

As this example demonstrates, smell did not represent the citizens' only environmental concern; in addition to smelling bad, the waste that butchers produced was also an "abominable sight." The very sight of blood itself added to the problem, which again may have been connected to the stigma associated with the impurity of blood. This example demonstrates the point more clearly: "and that no barbers shall be so bold or so daring, as to put blood in their windows openly or in view of folks; but let them have it carried privily unto the Thames, under pain or paying two shillings unto the use of the Sheriffs" (Riley, 1861, p. 236).

Broadly speaking, fear of disease was not the only reason that medieval England's urban inhabitants wanted to keep their environments clean. They also cared about aesthetics, whether blood was involved or not, and the need to keep the streets, walkways, and waterways unobstructed: "Writ to the Mayor, Sheriffs, and Aldermen forbidding the casting of rushes, dung, and refuse into the Thames, and ordering the removal of all such obstructions of the river's course (1372)" (Sharpe, 1905, folios ccxci-ccc). This had been a concern in London from at least the late-thirteenth century, when the warden and sheriffs of London declared that "the course of the Wallebroke shall be entirely freed from dung, rotten matter, and other obstructions and nuisances..." (Sharpe, 1899, folio 126 b). In the case of rivers and waterways, two problems could arise from obstructions: flooding and the buildup of waste matter (Harris, 1907, p. 31). Within medieval urban communities, latrines were commonly built over running waterways; if these waterways became obstructed, waste would not be able to wash away (Sabine, 1934, p. 306).

In addition to the butchers, other residents would often throw various types of refuse onto the streets, into the ditches, and into the waterways, such as dung, debris, and other forms of trash. The presence of animals within the city naturally contributed to this problem, as the disposal of dung was a frequent concern in the records; like butchers' waste, dung not only smelled bad, but it could also become an obstruction if left in the streets, as illustrated by this example: "the jurors presented that the common lane leading to le pettes was obstructed because John ate Watre and others and their servants cast dung there, and the carters of London daily brought dung from divers places in the City and unloaded it in the Ward, against ancient custom and to the oppression of the whole Ward" (Thomas, 1929, roll A 18, membrane 7). It is not entirely clear whether the "oppression of the whole Ward"

referred specifically to the unpleasant smell of the dung, the health threat of the dung, or the obstructions that were caused by piles of dung; most likely, the citizens from this ward were concerned about all of the above. This next case more directly associated the presence of dung with unsanitary conditions: “John Stockyngbury was brought before the Mayor and Aldermen for having a large dung heap on the banks of the Thames next to his house at Billingsgate, to the detriment of the Thames water, the damage of the commonalty and the disgrace of the city” (Thomas, 1932, roll A 25, membrane 6). Here, the concern seems to be that the dung polluted the water, but whether they feared this pollution because the dung smelled bad or because they simply did not want animal waste in their water is unclear. For proper disposal, dung was either transported to dung-boats on the Thames whereby it left the city or simply carried outside of the city on carts to approved dumping areas, as was the case in this fifteenth-century proclamation “forbidding the casting of dung or rubbish into the streets or river, or depositing it on Tourhill, but the same is to be carried out of the City...” (Sharpe, 1909, folio lxvii b; Sabine, 1937, p. 24).

In addition to animal waste, the disposal of human waste also features prominently in the records. To deter public defecation or urination in the streets, towns and cities throughout medieval England had public latrines, including London, Coventry, Salisbury, Leister, and York. In London, running water seems to have been the most common method of clearing away human waste. Many citizens also had private latrines that either emptied into cesspools or into a waterway. Both methods of disposal had their issues. In 1383, authorities in London officially permitted citizens to build latrines over the Walbrook stream, which ran through the center of the city. However, by the mid-fifteenth century, all latrines over the Walbrook were abolished and the stream was paved over; there were further attempts to stop latrines from being built over running water later in the century, presumably for the same reasons that Londoners did not want animal waste, including dung and blood, in their water. While cesspools were an alternative to dumping human waste directly into waterways, they also became nuisances if they were constructed too close to a neighbor’s property or allowed to overflow (Sabine, 1934, pp. 306-319). In one instance, a man descended into his privy well (*cloacam*) to retrieve a board and died because he “was overcome with the bad air and fumes.” His friend went in after him and “fell suddenly dead from off the ladder by misfortune” (Sharpe, 1900, folio 115 b). Sabine (1934) clarifies that this was probably due to a buildup of carbon dioxide, but to medieval Londoners, the incident may have reinforced the belief that bad air was dangerous and could even be deadly (p. 317). In a similar account, a man descended into his well to retrieve a bucket and “accidentally fell into the well and was asphyxiated by the bad air” (Sharpe, 1900, folio 116). Even though this does not seem to have been a privy well, the bad air was still responsible for someone’s death.

Authorities frequently attempted to curb the practice of improper waste disposal through regulations like those above, but the high number of them in the records for this period may indicate that the regulations were not particularly effective. In this example from early-fifteenth century Coventry, authorities went so far as to try to keep animals away from the town ditch in order to limit the accumulation of dung therein: “the town ditch to be kept free from dung (*finum*); no animals to pasture on its banks” (Harris, 1907, p. 54). Animals feature in another example from the same year when the Red Ditch was ordered to be cleansed and “all pryves & swynesties thereon be done away” (Harris, 1907, p. 59). As punishment for “illegal dumping,” the offender was usually fined, as in this example from mid-fourteenth century London: “If the wardens found anyone casting rubbish, gravel or dung out of their doors into the said streets...they were to levy from each offender the sum of 2s...” (Thomas, 1929, roll A 13, membrane 6). In some cases, dumping could also lead to a person’s arrest: “Thomas Sherman and John le Soutere...were committed to prison for casting mud and rushes into the Thames...” (Thomas, 1929, roll A 10 ii, membrane 14 b). Lastly, in this example, the punishment was commensurate to the crime: “that those who had been charged with throwing filth into the Fleet ditch shall cleanse that part of the ditch adjacent to their premises before Christmas next, under penalty of 10£” (Sharpe, 1912, folio 20).

Both Coventry and London appeared to have designated dumping areas: “Muck Hill” and “Tower Hill” (Harris, 1907, p. 113; Thomas, 1929, roll A 17, membrane 5 b). However, London’s citizens may have only resorted to dumping on Tower Hill because of the regulations against dumping in the Thames, not because authorities gave them permission. If they did receive permission to dump at Tower Hill at some point, it did not last: “Writ to the Mayor and Sheriffs, drawing attention to the accumulation of refuse, filth and other fetid matter on Tower Hill, whereby the air was foully corrupted and vitiated and the lives of those dwelling or passing there were endangered. The King is unwilling that these intolerable conditions shall continue, and insists that the place shall be cleansed and kept clean under penalty of 100 marks” (Thomas, 1929, roll A 17, membrane 5 b). In addition to the ban on dumping in this location, the record also highlights the main reason why Tower Hill needed to be cleaned: to eliminate the bad air that was a threat to the lives and well-being of nearby residents. Once citizens were not allowed to dump their refuse and waste matter on Tower Hill, they appear to have resorted to more dumping in the Thames, as indicated by the amount of Thames dumping violations thereafter (Sabine, 1937, pp. 38-39).

Even though city-cleaning regulations frequently focused on the issue of aesthetics, comfort, keeping waterways clear, and maintaining passable streets and walkways, the possibility of disease was always a concern; in the example from the preceding paragraph, the “air was foully corrupted and vitiated and the lives of those dwelling or passing there were endangered.” The records that focus on butchering, human and animal waste, and bad-smelling refuse all indicate that bad air was an ever-present source of complaints during this period. In addition, the records indicate that water contamination was also a concern; bad-smelling water has already been addressed, and in those cases, the concern was the same as that demonstrated as a result of bad air where the connection to poor health was made because of the foul odors. In this example concerning the condition of the ditch that surrounded Fleet prison, the connection between contaminated water and bad smells is not directly mentioned, but it seems probable considering what went into the water: “that John de Bristoll, tanner, had erected two tanneries and a latrine, contaminating the water, and that John de Depham...had similar latrines...” (Thomas, 1905, folio xl). However, there also seems to be evidence that dirty water in general was a concern, whether it smelled bad or not. For instance, in these examples from mid-fifteenth century Leicester and Coventry, officials seem to have been concerned with maintaining safe drinking water: “no woman to wash clothes at or otherwise corrupt the common wells of the town or in the High Street under pain of imprisonment” (Bateson, 1901, p. 291), “no person to ‘washe’ at the conduit, or 2d. fine” (Harris, 1907, p. 312), and “that no man or woman from henceforth wash ‘lomez’ [webs of cloth from the loom] nor cloths at the conduit...upon pain of 4d. at every default” (p. 338). As these cases demonstrate, offenders were either fined or even imprisoned in an effort to discourage water contamination. This record from late-fourteenth century London further illustrates the concern for clean well water: “moreover...complains that she and...a certain William Wythome share a well (*unim puteum vel fontem*), which for lack of a cover, and of cleaning and repair is so stopped up with filth that she can get no clean water (*aquam claram*)...” (Chew, 1973, p. 170). However, fear of disease may not have been the concern here; perhaps the woman was only concerned about being able to get water that was free from dirt and debris. Yet, the previous examples from Leicester and Coventry more plausibly give the impression that the town officials were concerned about water contamination beyond the presence of debris.

Although bad air seemed to be the greatest threat to good health, good food and water were also necessary, as explained in the writings of Galen and demonstrated by the earlier example from the Black Death period. Also, in the *Hippocratic Corpus* (particularly in “Airs, Waters, and Places”), the importance of healthy water receives considerable attention, such as comparing the purity of rainwater to the foulness of marshy water, which has a strong smell (Adams, 1952). In general, many examples from the records of London clearly illustrate that city authorities attempted to reduce the consumption of bad food and water: “Margaret Hore, ‘fishwyfe,’ condemned to the pillory for women, called ‘le thewe,’ for selling bad fish (1372)” (Thomas, 1905, folio ccxcii), “...that Brewers shall not consume the water of the Conduit” (Riley, 1861, p. 608), and “also, Nicholas Hay, baker, is accustomed to bake his

bread with water from a horrible well in his house, to the great danger and nuisance of all men who eat of it...(1422)” (Thomas, 1943, p. 135). In the case of selling bad fish, the primary concern may have been that the fish simply tasted bad, and thus the woman was penalized for her bad business. Of course, bad taste may have also represented a sign of unhealthy food. An example from early fifteenth-century Coventry more directly indicates that the authorities may have been worried about rotten and diseased food making people sick: “we command that no butcher sell no beasts of murrain (*beestis of moren*), nor no rotten sheep...and that they put no flesh to sale on the Sunday that is left on the Thursday, but if it be salted, and able for man’s meat” (Harris, 1907, pp. 25-26). Likewise, from London, clear regulations were in place that restricted the sale of old and rotten meat, particularly if it was “putrid” and “stinking” (Riley, 1861, p. 517-522). The other examples from above focus on protecting people from bad water because it was connected to disease, especially the third example where the consumption of bread made from bad water posed a danger to those who consumed it. Also, this type of concern was not restricted to London; in late-fourteenth century York, it was ordained that “no citizen of the city wash skins without hair of oxen or other animals in the said water...; nor in any other place on either one side of the [bridge of] Ouse or the other, where the water is drawn for brewing or baking, no refuse of pigs or offal or any other noisome stuff shall be thrown into the said water...” (Sellers, 1911, p. 15). Likewise, in fifteenth-century Coventry, citizens were ordered not to “fetch water thence to brew nor to steep with, upon pain of 4d. at every default” (Harris, 1907, p. 338). In general, the belief that bad-smelling water could corrupt not only its safety as drinking water, but also any food that was cooked with it, was not only common knowledge in the Middle Ages due to the medical knowledge inherited from antiquity, but also from contemporary accounts. In a Norman description of how people contract the sweating sickness, the physician explains that various sources of bad smell, such as dead animals, corrupt the air and water and that “the meats that are boiled in such waters are infectious (*infectable*)...and when as meat is boiled and drink made of this water much sickness is gendered in man’s body” (Rawcliffe, 1995, pp. 77-88).

A few English municipal records also focus on regulating bathing practices: “Writ to the Sheriffs for proclamation to be made forbidding bathing in the fosses of the Tower or in the fosses or river near the Tower by day or night on pain of forfeiture of life and limb” (Sharpe, 1904, folio clxxxvi). In this case, the ban on bathing near the Tower may have been related to the foul dumping ground of Tower Hill and the danger presented to the bathers as a result. Since the record is from 1350, right around the time of the Black Death, it may have been connected to a newer sense of hygiene as a result of the plague. According to Giovanni Boccaccio in his introduction to *The Decameron*, “...not only did it infect healthy persons who conversed or had any dealings with the sick, making them ill or visiting an equally horrible death upon them, but it also seemed to transfer the sickness to anyone touching the clothes or other objects which had been handled or used by victims” (Boccaccio, 1972, pp. 50-51). This account seems to indicate that the transmission of disease by way of clothing or objects was a new concern at this time as a result of the Black Death, which may have been connected to an increase in hygiene, as well as more caution when it came to consuming food and drink. However, even though most records that focused on maintaining good food and water, as well as bathing, are dated after the mid-fourteenth century plague, most did not immediately follow plague outbreaks signaling a direct effect, but were spread throughout the fifteenth century; therefore, a direct correlation between the two cannot be concluded from the municipal records. Furthermore, the connection between bad food and disease had been established before the Black Death, as this example from 1319 illustrates: “Adam de St. Alban...sworn to survey the meat came before...the Sheriffs, and...brought before them two bullock carcasses, putrid and poisonous, which had been taken from William Sperlyng de West Hamme, and which he intended to sell...The jurors...find that the meat was bad and that the animals died of disease. Judgment that the said William Sperlyng be set on the pillory and the carcasses burnt beneath him” (Sharpe, 1903, folio xciv b).

Aside from depopulation, the plague receives very little attention in the municipal records. In his article that focuses on city cleaning, Sabine (1937) argues that environmental regulations did generally increase following

the Black Death. Immediately following the plague, city cleaning was disrupted due to the population loss and general lack of morale; however, London soon rebounded and pursued city cleaning activities and regulations with more dedication than ever. The records for London do seem to support his conclusion; environmental regulations appear much more often after the mid-fourteenth century, but then drop off in again the fifteenth century. This either could have been because the earlier regulations had been effective and there was no need for more in the fifteenth century, or because memories of the Black Death had waned; since the population would have been increasing in the fifteenth century, and a larger population leads to more waste, it does not seem likely that the old regulations would have been effective for long. Furthermore, even though there was not a surge of new environmental regulations following outbreaks of the Black Death, there is a record from the *Close Rolls* that demonstrates that the king believed that environmental regulations were needed to combat the effects of the plague:

To the mayor of London. Order to cause the human feces and other filth lying in the streets and lanes of that city and its suburbs to be removed with all speed to places far distant from that city and to cause the city and suburbs to be cleansed from all odour and to be kept clean as it used to be in the time of preceding mayors, so that no greater cause of mortality may arise from such smells, as the king has learned how the city and suburbs, which are under the mayor's care and rule, are so foul by the filth thrown out of the houses both by day and night into the streets and lanes where there is a common passage of men that the air is infected, the city is poisoned to the danger of men passing, especially in the mortality by the contagious sickness which increases daily (1349). (Lyte, 1906, membrane 20d)

Yet, aside from the possibility that concerns over hygiene and clean food and drink stimulated new regulations after the plague years, most of the general concerns remained the same. In other words, while the Black Death may have enhanced public health concerns, it did not create a sense of public health. The residents of medieval English towns and cities had already been drawing a connection between their health and well-being and the condition of their environment from at least the late-thirteenth century. Eventually, residents were ordered not to build latrines over the watercourse, and the butchers were ordered to practice their trade outside the walls of several towns and cities, but this did not occur until near the end of the fifteenth century, well after the initial effect of the Black Death.

During the late-medieval period in England, legal regulations that focused on general public health issues in urban areas—healthy air, food, and water—were put into place by both the king and local authorities and enforced by both city authorities, such as the mayors, aldermen, and sheriffs, and by private citizens through their complaints. In addition to the practical need of maintaining free flowing water and roadways that were not blocked, they wanted clean food and water, a reduction of horrible, infectious smells, and a general healthy environment. Their environmental theories behind what they had to do to make their urban space healthy were based on medieval (and ancient) ideas of disease and contagion, but these ideas were still responsible for motivating the authorities and citizens of medieval towns and cities to create and enforce environmental regulations that focused on cleanliness, hygiene, and sanitation. In late-medieval English towns and cities, the condition of one's health was intimately tied to the condition of the environment.

In a manner of speaking, the officials in these urban areas had a concept of public health. No one issued a general public health policy that might be compared to a more modern counterpart, but in late-medieval England, regulations that focused on maintaining the good health of town and city inhabitants were created and enforced. Regarding physical maintenance, public latrines reduced public elimination of waste in the streets, and workers were hired specifically for the task of street-cleaning, cesspool emptying, and removing waste from the city (Sabine 1934; 1937; Jorgensen 2008; 2010). Moreover, sanitary regulations did not only exist in the largest city of London; similar types of urban regulations were used throughout all of England. Going a step further than other studies that

have proven that medieval people regulated their urban environment, this study argues that not only did they have some level of environmental concern, but they also were interested in public health. Many believe that public health did not exist prior to the modern period for the same reasons that they assumed that environmental conditions in medieval cities must have been exponentially more horrible than that in modern cities and that history is progressive. However, looking beyond modern ideas of disease and bacteriology and modern health codes, medieval cities did indeed have standards of public health that both public authorities and private citizens regularly enforced.

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