A Breath of Fresh Air: Approaches to Environmental Health in Late Medieval Urban Communities

Carole Rawcliffe

In 1450, Thomas Cornwaleys brought a prosecution in the Court of King's Bench against six London butchers for dumping 'dung, intestines and other foetid and disgusting matter' in the garden of his house at Aldgate. Since the King's Bench was England's premier common law court, which dealt with cases of treason, murder, and other major felonies, it seems strange on the face of things that the justices should have entertained litigation about the medieval equivalent of fly-tipping. But this was no ordinary nuisance. The butchers were accused of endangering Cornwaleys' life and the lives of his servants with the lethal stench (*fetor*) of their waste, and of making it impossible for him to remain in his home without the greatest physical risk (*absque maximo corporum suorum periculo*). After several delays, the accused appeared in court and were committed to prison on 2 December, by which point, not coincidentally, plague had broken out in London.¹ The outcome of the suit, in which

C. Rawcliffe (✉)

School of History, University of East Anglia, Norwich, UK

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Cornwaleys sought damages of £40,² is not known, but complaints of this kind (especially from high status individuals) were treated very seriously. They also had a long history, predating the Black Death of 1348–50 by many years.

At the start of the fourteenth century, for example, the staff and students of Oxford University had submitted a battery of petitions to the crown about the filthy state of the town's streets and the environmental pollution that ensued. In 1310 they singled out Oxford's butchers as particular offenders on this score, since they caused 'so great a corruption' when slaughtering animals that 'many people' fell ill and some even died through the inhalation of toxic air.³ On other occasions the king himself might intervene directly, as happened in 1332 when Edward III reprimanded the rulers of York over the 'abominable smell abounding in the said city [...] from dung and manure and other filth and dirt', ordering them to clean the streets before Parliament assembled there and lives were put at risk.⁴ It is thus hardly surprising that he should insist upon the permanent removal of slaughterhouses from London during the second plague epidemic of 1361–62, renewing the order when pestilence returned in 1368–69. His efforts to confine these noisome activities to Knightsbridge (in the west) and Stratford (in the northeast) none the less had unwelcome consequences and encountered widespread resistance. Whereas some butchers raised their prices to allow for the cost of transport, thereby occasioning disturbances in the City, others took the easy option of butchering cattle just outside the walls and leaving their offal to decompose in the watercourses, fields, ditches, and gardens of people like Cornwaleys.⁵

The outcry made in 1379, another plague year, by a group of influential courtiers and other prominent residents living in Holborn reflects a timeless desire on the part of affluent householders to preserve the value of their property. Yet a real fear of infection is also apparent from the petition for redress which they submitted to Parliament, the highest court in the land, protesting that:

[...] because of the great and horrible stench and deadly abominations which arise there from day to day from the corrupt blood (*sank corrupt*) and entrails of cattle, sheep and pigs killed in the butchery next to the church of St Nicholas in Newgate and thrown in various ditches in two gardens near to Holborn Bridge, the said courtiers, frequenting and dwelling there, contract various ailments, and are grievously exposed to

disease (*trope grevouement mys a disease*) as a result of the infection of the air, the abominations and stench above said, and also by many evils that notoriously ensue.⁶

Protests of this kind eventually gave rise to a parliamentary statute of 1388 that comprehensively forbade the deposit of butchers' waste and similar refuse in or near *any* English towns or cities because of the threat to public health posed by miasmatic (noxious) air.⁷ The butchers sued by Cornwaleys in 1450 were thus not only potential homicides, but were also in breach of statute law, which constituted another serious criminal offence.

The English were certainly not alone in demonstrating acute sensitivity to the stench of rotting carrion. In 1416 the advisors of King Charles VI of France had, for instance, ordered the demolition of Paris's Great Butchery (les Halles), which stood alarmingly near the royal palace of the Châtelet, and its replacement by four new flesh markets outside the walls. The adjacent slaughter- and scalding-houses were likewise to be moved to a site beyond the Tuileries, 'less dangerous to the public health of our said city and less likely to corrupt the air of the same'. The entire operation was justified on medical grounds, it being deemed necessary 'to provide and take precautions against the infections and corruptions noxious to the human body' engendered by so much potentially toxic waste.⁸ When the relocation of slaughterhouses proved impractical, other precautions, such as rebuilding on hygienic principles, would be adopted, preferably with improved water supplies for more effective cleansing.⁹ As a last resort, regulations issued by the Dublin Assembly in 1484 for the safer management of the 'flesshambles' insisted that a keeper should 'locke and steke the dorres and wyndouus of the saide shambles and so kepe them fast at all tymes but when the said bouchers selleth their flesshe'.¹⁰ Hefty fines penalised any infringements that might contaminate the surrounding area.

Such measures were not confined to butchers, nor were they, as we have already seen in the case of Oxford and York, simply a knee-jerk response to the panic which understandably gripped urban communities in the aftermath of the Black Death. Recent work on medieval public health has stressed the comparatively early date of environmental legislation that explicitly reflects the connection made by urban magistrates between bad smells and the spread of disease.¹¹ In 1283–84 the rulers of Treviso ordered that dung and waste should be removed quickly from the

streets because they ‘infect the air and create a pestilence (*aeram inflicunt et faciunt pestilentam*) through which human bodies succumb to illness and suffer death’.¹² Ordinances for the expulsion of noxious trades such as tanning from Pistoia, dated 1296, were likewise justified specifically because ‘it is civil and expedient for the preservation of people’s health that the city [...] be cleared of stench from which the air is corrupted and pestilential diseases ensue (*ex quibus aer corumpitur et pestilenciales egretudines oriuntur*)’.¹³ Chemical as well as organic processes were also beginning to cause anxiety. It was in the seventeenth century that John Evelyn compared London to ‘the face rather of *Mount Aetna*, the *Court of Vulcan*, *Stromboli*, or the Suburbs of Hell’, but already by the 1280s lime-burning with sea coal, which produced an ‘intolerable stench’, appeared to spread ‘infection and corruption of the air’ as it wafted into the homes of prominent citizens and even the queen herself.¹⁴

Where did these ideas originate? A Latin version of the pseudo-Hippocratic text *Airs, Waters, Places* had been in circulation from the twelfth century, underscoring the importance of fresh, temperate air for communal health. Its influence is apparent in the urban panegyrics that proliferated during the later Middle Ages, praising not only the cleanliness but also the invigorating environments of various European cities.¹⁵ Thus, for example, Bonvesin de la Riva’s paean to Milan, *De magnalibus Mediolani* of 1288, asks with a fine rhetorical flourish: ‘Are there no putrid pools or lakes corrupting the air with their damp or stench? Certainly not! Here one finds clear fonts and fertile rivers’.¹⁶ Similarly, the Franciscan friar Francesc Eiximenis begins the regimen that he composed in 1383 for the magistrates of Valencia by extolling first among the city’s many attractions its ‘fine and clear’ air, uncontaminated by any of the fumes or turbidity that blighted the climate of England, France, and Germany.¹⁷

More significant in the present context, however, was the work of the celebrated Greek physician Galen of Pergamum (d. 216), which underpinned most medieval ideas about human physiology. Since the effectiveness of all physical and mental processes initially depended upon what one ate, health was, to a notable extent, determined by diet, ‘the first instrument of medicine’.¹⁸ Having been cooked in the oven of the stomach, partially digested food was conveyed to the liver, where it was converted into humoral matter: blood (hot and wet), phlegm (cold and wet), black bile (cold and dry), and yellow bile (hot and dry). From the liver, the blood and other humoral matter, known as the natural spirit, travelled along the veins to the organs and extremities, being absorbed as essential nourishment (Plate 7.1). During this third, final stage of the

Plate 7.1 From an English-owned medical treatise of *ca.* 1292, this diagram of the venous system depicts the stomach, intestines, and liver (the leaf-shaped organ on the figure's right side), where the natural spirit, or humoral matter, is generated from food and transported along the veins to the extremities. (Bodleian Library, Oxford, MS Ashmole 399, f. 18r)

digestive process, the natural spirit might easily be affected by the quality of the air drawn into the body through the open pores. For this reason, anything likely to raise one's temperature and encourage perspiration, including sexual activity, rich food, and excessive amounts of alcohol, was to be avoided during epidemics. Exemplifying the symbiotic relationship between morality and medicine characteristic of so much late medieval advice literature, one vernacular plague tract warned that 'men that abusen them self with wymenn, or vsen ofte times bathes, or men that be hote with labour or grete angre' would inevitably be 'more disposed to this sekenes'.¹⁹

Although the concept of circulation as we know it today was not clearly understood until the seventeenth century, it was assumed that some blood passed directly to the heart, whose function was to generate heat, the source of life itself. Flowing through the septum, from right to left, it mingled with cooling air from the lungs and entered the arterial system as a frothy substance, known as vital spirit or *pneuma*, because it transported enlivening warmth throughout the body.²⁰ The nature of the external environment played a crucial role at this stage, since corrupt air, such as that thought to carry plague, could rapidly poison the entire system, while fresh breezes and fragrant aromas could strengthen it (Plate 7.2). Many authorities regarded odours as corporeal entities or 'smoky vapours', somewhere between water and air, which transported 'the prynte and likenes' of the thing from whence they came directly into the bodies of those who inhaled or absorbed them.²¹ As both Hippocrates and Galen had observed, they could therefore play a supplementary role in nutrition, bypassing the first two stages of the digestive process altogether, and providing a valuable source of nourishment for delicate patients with poor appetites. Writing in 1489, the Italian physician Marsilio Ficino recommended the application of poultices of warm bread mixed with mallow wine and mint powder to the abdomens 'and sometimes just the noses' of elderly or emaciated individuals, who would be comforted by the heat and sustained by the fortifying smell.²²

The vital spirit that reached the brain was, according to Galen, filtered through a network at the top of the spinal cord called the *rete mirabile*. Once mixed with air inhaled through the nostrils this purified blood—known as the animal spirit—quite literally animated both body and mind, influencing behaviour in part according to information derived from the senses. It responded with great acuity to sights and smells, both of which were believed to have a powerful impact upon mental as well as physical

Plate 7.2 From the same medical treatise, this diagram of the arterial system depicts the process whereby some venous blood passes through the heart (the lozenge on the left of the figure's chest), where it is warmed and purified. When mixed with air from the lungs it becomes *pneuma*, or vital spirit, which is carried along the arteries. (Bodleian Library, Oxford, MS Ashmole, f. 19r)

health. Graded according to the relative quantities of heat, cold, moisture, and aridity that they possessed, aromatic plants could be prescribed to rectify the humoral balance and soothe or stimulate the spirits. Since the scent of marjoram was, for instance, warm and dry in the third degree, it served to counterbalance excessive phlegm in the stomach and intestines, to purify the blood and to counteract occlusions of the brain.²³ Conversely, however, repellent odours had both a contaminating *and* destabilising effect. Once they penetrated the inner recesses of the brain, the ‘derknesse and stenche’ of acrid smoke, such as that generated by lime-burners and plumbers, threatened the processes of thought and movement, and thus seemed particularly dangerous.²⁴

A clear exposition of these theories, which had initially been developed in several different Galenic texts, might be found in the *Canon* of Avicenna (Ibn Sīnā, d. 1037). This great work, which systematised and embellished Galen’s medical teachings, formed the bedrock of the European medical syllabus from the thirteenth century onward. An influential passage in book four describes the toxic effect of miasmatic exhalations upon the human body:

Vapours and fumes rise [into the air] and spread in it and putrefy it with their debilitating warmth. And when air of this kind reaches the heart, it corrupts the complexion of the spirit that dwells within it; and, surrounding the heart, it then putrefies it with humidity. And there arises an unnatural heat; and it spreads throughout the body, because of which pestilential fever will occur, and will spread to a multitude of men who likewise have vulnerable dispositions.²⁵

It was only to be expected that the university authorities in Cambridge, who knew their Avicenna, should insist in the aftermath of the fourth national pestilence of 1374–75 that all ‘putrid flesh’ and other noxious waste should be removed from the market every morning and evening.²⁶ Members of the intellectual elite did not, however, exercise a monopoly in this regard, and might well find themselves at the receiving end of complaints from aggrieved neighbours. In an ongoing dispute with Christ Church priory, residents of Canterbury accused the monks in 1425 of destroying the city ditch with ‘ordure and felthe’ from their dormitory, while recklessly endangering the health of local people. Whether or not many of them had, indeed, been ‘enfected gretly’ by the contaminated air and become ‘grievously [...] dysseyd’, the fact that petitions of this

kind increasingly assumed an awareness of the underlying medical theory is itself highly significant.²⁷

Guidance about the preservation of health had by then begun to circulate widely in the more accessible format of the *Regimen sanitatis*, or Regimen of health, which explained how to avoid sickness through the careful management of six external factors known as ‘non-naturals’. The earliest of these texts were commissioned by royalty and other influential figures, being customised to meet their personal needs, although the quality of the air and the salubriousness of the environment invariably commanded particular attention.²⁸ The physician Aldobrandino of Siena (d. 1287) produced one such regimen for the use of Eleanor of Provence, queen to Henry III, which was written in her native French rather than Latin. It stresses the importance of avoiding ‘the corruption of the air’, while also drawing attention to the dangers of fumes and smoke,²⁹ and may well have influenced her decision in 1257 to leave Nottingham for the purer air of Tutbury because the burning of sea coal made life there profoundly disagreeable.³⁰ Both Latin and vernacular versions of Aldobrandino’s regimen attracted a wide readership in the later Middle Ages, confirming that much of the advice on offer was applicable to less privileged individuals and, indeed, entire communities. A regimen devised by the eminent Catalan physician, Arnald of Villanova (d. 1311), for King James II of Aragon dealt at great length with the complex mechanisms of respiration. Yet its underlying message was commendably clear and concise:

The first item or consideration with regard to the preservation of health concerns the choice of air. For among the things which, by necessity, affect the human body nothing changes it more than that which, inhaled by the mouth and nostrils [...] and mixed with the spirit of the heart, travels along all the arteries and by which means all the activities of daily life are accomplished.³¹

In a society which positively encouraged plagiarism, works by eminent authorities such as Aldobrandino and Arnald were enthusiastically copied, translated, abridged, and simplified to suit new urban audiences.

John Mirfield, a priest who lived at St Bartholomew’s priory in London, near the unsavoury purlieu of the Smithfield butcheries, produced two *regimina* for the benefit of the resident canons at the turn

of the fourteenth century. Drawing heavily, but without acknowledgement, upon the *De conservatione vite humane* of the French physician, Bernard Gordon (fl. 1305), he describes the salutary effects of a brisk walk in the countryside, far away from polluted streets and overflowing cesspits. As he explains, exercise offers ‘pure recreation of the soul and body when it is performed in the open; for then a man is exposed to wholesome air (*bono aeri*), and he rejoices in gazing far and near, and upon the sky, the sea and the green landscape’.³² Access to fresh air was a major preoccupation of religious living in cramped urban monasteries, as we can see from complaints repeatedly voiced by the Durham Benedictines. They objected at various times to the polluted environment (*aer corruptus*) of their ‘intolerably overcrowded’ precinct and asked for a garden in which they could enjoy the benefits of healthy recreation in wholesome air.³³

On the pragmatic basis that ‘protecting [people] is a much more powerful and secure response than treating them once they are actually sick’,³⁴ vernacular self-help manuals began to proliferate after the Black Death, when the demand for advice about preventative medicine naturally grew. Indeed, a more specialist type of guide or *consilium* achieved widespread popularity from the 1340s onward by concentrating upon the avoidance of epidemics and highlighting the risks posed by such hazards of urban life as dung heaps, butchers’ waste, and stagnant drains. Many of these works were produced, initially at least, for the assistance of magistrates. The physician Jacme d’Agramont (d. 1348) wrote a concise *Regiment de preservacio a epidemia* in his native Catalan for the rulers of Lerida, explaining how ‘particular’ sources of airborne corruption might be contained by sanitary measures.³⁵ Tommaso del Garbo (d. 1370) applied himself to ‘the well-being and health of the men who live in the city of Florence’, while the *Regimen contra pestilentiam* drawn up by Jean Jacme (d. 1384) for the benefit of the ‘commonwealth’ of Montpellier took on a new life in the fifteenth century as the much-copied and revised ‘Canutus’ plague treatise.³⁶

During the devastating epidemic of 1407, physicians teaching at the University of Oxford supplied the mayor and aldermen of London with a *consilium* (copied verbatim from an earlier tract by John of Burgundy),³⁷ although their advice may by then have seemed unnecessary. The number of orders for cleansing the streets and water courses of noxious waste recorded in the city’s Letter Books had already risen fourfold from just sixteen between 1300 and 1349 to at least sixty-five during the second

half of the century. Since the population of London fell by at least half during the same period and thus generated far less garbage, these figures seem particularly striking. Practical steps had also been taken to improve refuse collection: in the aftermath of the 1368–69 epidemic, for example, the authorities invested in twelve new tumbrels and twenty-four more draught horses to facilitate the regular removal of household waste from wards that needed additional resources.³⁸

The spread of literacy among urban populations, and with it the ability to read simple vernacular texts, further expanded the market for accessible literature. Like many other late medieval religious, John Lydgate (d. 1449/50), a Benedictine monk of Bury St Edmunds in Suffolk, considered it his Christian duty to provide essential information in a format that ordinary laymen and women could understand. Written in verse, so that his recommendations could more easily be remembered by those with little or no learning, his ‘Dietary and Doctrine against the Pestilence’ has been described as ‘a medieval best-seller’. It survives in at least fifty-seven manuscript copies and was published in prose versions by England’s first three leading printers.³⁹ Lydgate focussed principally on diet and the importance of moderation, but he, too, emphasised the benefits of ‘clere ayre’, warning his readers to avoid ‘mystys blastys’, ‘infect placys’ and ‘the aire of pestylens’ at all costs. Longstanding connections with the aldermanic elite of London gave him a sound grasp of the practical problems faced by magistrates in the struggle against disease, while inspiring him to imagine what might be achieved through the systematic application of the regimen to communal life. His *Troy Book* (1412–20) was composed at a time when the Londoners were beginning to replace and extend the system of pipes and conduits that had brought fresh, unpolluted water within the walls since the thirteenth century.⁴⁰ Did he intend to offer advice as a medically informed ‘proto-city planner’ or simply to reflect more generally upon the importance of effective sanitation?⁴¹ It is certainly worth noting that his evocation of Troy as a utopian community celebrates King Priam’s ingenious use of hydraulics to flush away ‘ordure & fylthes’ from the streets through subterranean channels:

Wher-by the toun was outterly assured
 From engenderyng of al corrupcioun,
 From wikked eyr & from infeccioun,
 That causyn ofte by her violence
 Mortalite and gret pestilence.⁴²

Shorn of their theoretical underpinnings, these ideas began to percolate downwards through society, their transmission being hastened by repeated outbreaks of plague from the 1360s onwards.⁴³ Public proclamations, whereby the texts of official measures would be read aloud in the streets, helped further to spread information among the illiterate.⁴⁴ Royal directives, such as Henry VII's stern missive of 1489 to the rulers of Dublin, were clearly intended for this purpose. Having warned that 'dung-heaps, swine, hog-sties, and other nuisances in the streets, lanes and suburbs [...] infect the air and produce mortality, fevers and pestilence throughout the city', the writ went on to explain that a mandatory programme of street cleaning would 'prevent loss of life from pestilential exhalations', while also encouraging trade.⁴⁵ Receptive or not, few residents could claim complete ignorance of the rationale behind these pronouncements, or deny the fact that an unhealthy environment could have serious economic consequences.

In English towns and cities, a network of local courts (often known as 'leets'), where infringements of bylaws and other perceived nuisances could be reported and penalised, offered the public an opportunity to protest about antisocial behaviour. The lists of notifiable offences compiled by magistrates for the guidance of juries invariably included such threats to survival as noxious privies and stinking dung heaps. These documents and the indictments that followed provide a fascinating insight into the way that medical ideas about the airborne spread of disease could inform proceedings.⁴⁶ Presumed lepers had, for example, long been obliged to live 'outside the camp', although their exclusion had little to do with overt fears of infection and was far from absolute. The belief, clearly enunciated in many plague tracts, that 'pestilence sores be contagious because of enfect humours' and that 'the reke or smoke of suche sores is venomous and corrupteth the ayer', led, however, to an inevitable hardening of attitudes toward segregation. So too did warnings about the pollution exhaled by anyone with tainted breath.⁴⁷ Cases involving the identification and removal of suspect *leprosi* refer increasingly from the 1360s onward to the danger that they posed as sources of unpleasant odours (*fetor*), and thus as potential vectors of plague as well as leprosy.⁴⁸ An analysis of 113 such presentments made between 1369 and 1501 to leet courts in the port of Great Yarmouth, which suffered badly from epidemics, reveals a distinct correlation between the identification of suspects and outbreaks of pestilence.⁴⁹ Significantly, when the rulers of London recorded a directive of 1472 (a plague year) from Edward

IV ordering them to confine anyone ‘enfected with the contagious and perilous siknes of lepour’ in an appropriate institution, lest they contaminate persons ‘of clene complecon’, they entered it in the city journal next to a copy of the above-mentioned statute of 1388 for the safe disposal of butchers’ waste.⁵⁰

Complaints about insalubrious living conditions came from the bottom up as well as the top down. The wording of presentments made at neighbourhood level reflects an obvious awareness on the part of ordinary people that bad air was not only potentially lethal but also a source of shame that reflected badly upon the entire community. Collective reputé was a powerful weapon in the battle against environmental pollution. In 1438–39 one of the Yarmouth leets that were on the look-out for suspect lepers presented four men for depositing ‘filth and the blood of beasts and blubber near the town gates in a public thoroughfare, causing a great stench to the grave nuisance of locals and outsiders and the *disparagement* of the vill’.⁵¹ Not surprisingly, Londoners were particularly sensitive on this score, in part because they were subject to constant surveillance by members of the royal household and government officials travelling to and from Westminster. In 1421 residents of St Martin’s parish, Ludgate, presented one William ate Wode:

[...] for making a great nuisance and discomfort to his neighbours by throwing out horrible filth on to the highway, the stench of which is so odious and infectious that none of his neighbours can remain in their shops, which is *a great reproof* [my italics] to all this honourable city, because of the lords and other gentlemen and men of the court who go and pass there.⁵²

Two years later, householders in the ward of Farringdon Without, which lay beyond the walls and was thus rather more prone to insanitary nuisances than those at the centre, gave vent to their exasperation at years of official inertia and neglect. It is interesting to note that they too referred to the malign effects of contaminated air upon the city’s reputation as well as its health:

The comune prive [privy] of Ludgate is ful defectif and perlus and the ordur ther-of rotith the stone wallys, and makith other while a horrible stench and a foul sight, to grete desese and nusans of all folk therabout dwellyng and therby passing, and a *desclauder to all this Citee* [my italics],

that so foul a nusans shuld be so nygh so comune an hy wey, and oft hit hath be presentyd and no remedye yit is ordeined.⁵³

Protests of this kind did not necessarily fall upon deaf ears. Municipal schemes for the preservation of public health, often launched in the aftermath of plague outbreaks, attracted growing support from private individuals, who regarded them as an extension of the ‘comfortable works’ incumbent upon all devout Christians [Matthew 25:32–36]. As a further inducement to almsgiving, many plague tracts maintained that charity was itself a prophylactic against epidemic disease.⁵⁴ From this standpoint, investment in street cleaning or the construction of purpose-built suburban slaughterhouses brought immediate physical benefits to the community, as well as promising long-term spiritual rewards to the donor.⁵⁵ Quite probably in response to appeals such as those from the householders of Dowgate ward, where lanes leading down to the Thames were rendered impassable by heaps of ‘stinking privy filth’,⁵⁶ the wealthy London mercer Richard Whittington (d. 1423) left money for the construction of a public lavatory with the capacity to seat 128 men and women. Malodorous waste could now be rapidly flushed away from the aptly named ‘long house’ directly into the tidal waters of the Thames, rather than contaminating the entire neighbourhood with its stench.⁵⁷ As his many bequests reveal, Whittington sought to improve the daily lives of his fellow citizens, while also assiduously providing for the health of his immortal soul. In response to the shockingly high death rate among prisoners exposed to ‘the infected and corrupt air and other perils and horrible diseases’ in ‘the hateful gaol of Newgate’, he paid for the entire complex to be demolished and rebuilt on sanitary principles.⁵⁸ The new prison, which opened in 1432, was lighter and better ventilated. Some chambers boasted their own privies and chimneys; there were facilities for indoor and outdoor recreation; and, thanks to the generosity of another eminent Londoner, Thomas Knolles, freshly piped water was freely available.⁵⁹ Whittington merits attention because of the scale and variety of his benefactions, but in other respects he was but one of many successful merchants driven by a combination of piety, civic pride, and compassion to tackle the environmental problems so clearly identified in contemporary *regimina* and plague tracts.

Despite the wealth of evidence to the contrary, the assumption that medieval people were incapable of conceptualising disease in any other than theological terms, and thus of taking practical steps to improve

communal health, remains entrenched.⁶⁰ It is easy to see why the sanitary reformer and author, Charles Kingsley (d. 1875), should bewail the tragic failure of medieval magistrates to recognise that ‘foul air’, ‘foul water’, and ‘unclean backyards’, rather than the ‘seemingly supernatural arrows of [the] angel of death’, gave rise to epidemics.⁶¹ He was, after all, the product of a society that believed in the inexorable march of scientific progress. But Victorian attitudes linger on, even today, when the word ‘medieval’ is still all too often employed as synonym for ignorance and superstition. The profoundly held belief that pestilence (and, indeed, all human suffering) was ultimately an act of God did not preclude a conviction that more immediate environmental hazards made people sick and might be eliminated, or at least contained, through the rational application of medical theory.⁶² We should also bear in mind that the provision of public works, such as regular refuse collections, paved streets, covered drains, and piped water, all of which helped to clear the air, ranked as an act of Christian compassion that would speed the donor on his or her way to paradise. Cleanliness was, in this instance, quite literally a manifestation of godliness; and although the implementation of sanitary measures may often have been an uphill battle, the reasoning behind them ought surely to defy our condescension.

NOTES

1. The National Archives, Kew, KB27/758, rot. 51. All translations into English from the original Latin or French in manuscripts and printed editions are my own.
2. Then equivalent to the annual salary of a senior member of the royal household.
3. Herbert Edward Salter, ed., *Munimenta civitatis Oxonie*, Oxford Historical Society 71 (Devises: G. Simpson, 1920), 13–14.
4. *Calendar of Close Rolls, 1330–1333* (London: HMSO, 1898), 610. N.J. Ciecieznski, ‘The Stench of Disease: Public Health and the Environment in Late-Medieval English Towns and Cities’, *Health, Culture and Society* 4 (2013): 92–104, lists some further examples, but fails to engage with the medical rationale behind them.
5. For the background to much of what follows, see Ernest L. Sabine, ‘Butchering in Mediaeval London’, *Speculum* 8 (1933): 335–53; and Carole Rawcliffe, “Great Stenches, Horrible Sightings and Deadly Abominations”: Butchery and the Battle against Plague in Medieval English Towns’, in *Plague and the City*, ed. by Lukas Engemann, John Henderson, and Christos Lynteris (London: Routledge, 2018), 18–38.

6. Geoffrey Martin and Christopher Given-Wilson, eds, *The Parliament Rolls of Medieval England, VI: Richard II 1377–1384* (Woodbridge: Boydell Press, 2005), 181. Residents of Holborn had been obliged to contend with airborne pollution since at least 1290: Marjorie Honeybourne, 'The Fleet and Its Neighbours in Early and Medieval Times', *London Topographical Record* 19 (1947): 13–87, on 51–54.
7. Andres Luders, et al., eds, *Statutes of the Realm*, 11 vols (London: Record Commission, 1810–28), vol. 2, 59–60.
8. René de Lespinasse, ed., *Les métiers et corporations de la ville de Paris I: XIVe–XVIIIe siècle, ordonnances générales métiers de l'alimentation* (Paris: Imprimerie Nationale, 1886), 274.
9. Rawcliffe, 'Butchery and the Battle against Plague', 24–26.
10. John Thomas Gilbert, ed., *Calendar of Ancient Records of Dublin*, 1 (Dublin: J. Dollard, 1889), 366.
11. See, for example, Guy Geltner, *Roads to Health: Infrastructure and Urban Wellbeing in Late Medieval Italy* (Philadelphia: University of Pennsylvania Press, 2019), 27–31, 47–67; and the various contributions in *Policing the Urban Environment in Premodern Europe*, ed. by Carole Rawcliffe and Claire Weeda (Amsterdam: Amsterdam University Press, 2019).
12. Bianca Betto, ed., *Gli Statuti del comune di Treviso (sec. XIII–XIV)*, 2 vols (Rome: Istituto Storico Italiano per il Medio Evo, 1984, 1986), vol. 1, 192–93. The authorities additionally banned the disposal of butchers' waste in the city's watercourses: 195. See also Guy Geltner, 'Urban *Viarii* and the Prosecution of Public Health Offenders in Late Medieval Italy', in *Policing the Urban Environment*, ed. by Rawcliffe and Weeda, 104.
13. Lodovico Zdekauer, ed., *Statutum Potestatis Comunis Pistorii (1296)* (Milan: Hoepli, 1888), 150–51.
14. Carole Rawcliffe, *Urban Bodies: Communal Health in Late Medieval English Towns and Cities* (Woodbridge: Boydell Press, 2013), 165–66; Peter Brimblecombe, *The Big Smoke: A History of Air Pollution in London Since Medieval Times* (London: Methuen, 1987), 6–16.
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16. Bonvesin de la Riva, *Le meraviglie di Milano*, ed. and trans. by Giuseppe Pontiggia (Milan: Bompiani, 2015), 29.
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21. Richard Palmer, 'In Bad Odour: Smell and Its Significance in Medicine from Antiquity to the Seventeenth Century', in *Medicine and the Five Senses*, ed. by William F. Bynum and Roy Porter (Cambridge: Cambridge University Press, 1993), 61–68; Rawcliffe, *Urban Bodies*, 120–21.
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23. Luisa Cogliati Arano, ed., *The Medieval Health Handbook: Tacuinum Sanitatis* (New York: George Braziller, 1974), nos XIX and 183.
24. Bartholomaeus Anglicus, *On the Properties of Things: John Trevisa's Translation of Bartholomaeus Anglicus* De proprietatibus Rerum, ed. by M. C. Seymour, et al., 3 vols (Oxford: Clarendon Press, 1975–88), vol. 1, 561–62.
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26. Charles Henry Cooper, ed., *Annals of Cambridge*, 5 vols (Cambridge: Warwick & Co., 1892–1908), vol. 1, 114.
27. Ernest F. Jacob, 'Chichele and Canterbury', in *Studies in Medieval History Presented to Frederick Maurice Powicke*, ed. by R. W. Hunt, W. A. Patin, and R. W. Southern (Oxford: Clarendon Press, 1969), 400–01.
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29. Aldobrandino of Siena, *Le Régime du corps de Maître Aldebrandin de Sienne*, ed. by Louis Landouzy and Roger Pépin (Paris: H. Champion, 1911), 59–61; Peter Murray Jones, *Medieval Medical Miniatures in Illuminated Manuscripts* (revised edn, London: The British Library, 1998), 103–7.
30. Henry Richards Luard, ed., *Annales monastici*, 5 vols (London: Rolls Series, 1866), vol. 3, 203–04.
31. Arnald de Villanova, *Regimen sanitatis ad regem Aragonum*, ed. by Luis Garcia-Ballester and Michael R. McVaugh (Barcelona: Fundació Noguera, 1996), 423.
32. Sir Percy Horton-Smith Hartley and Harold Richard Aldridge, *Johannes de Mirfeld of St Bartholomew's Smithfield: His Life and Works* (Cambridge: Cambridge University Press, 1936), 140–41.

33. Richard Barrie Dobson, *Durham Priory 1400–1450* (Cambridge: Cambridge University Press, 1973), 35; J. A. Twemlow, ed., *Calendar of Papal Registers: Papal Letters, XI, 1455–1464* (London: HMSO, 1921), 5–6.
34. Luke Demaitre, *Medieval Medicine: The Art of Healing, from Head to Toe* (Santa Barbara, CA: Praeger, 2013), 64, citing Valesco de Tharanta (d. 1417).
35. Jon Arrizabalaga, ‘Facing the Black Death: Perceptions and Reactions of University Medical Practitioners’, in *Practical Medicine from Salerno to the Black Death*, ed. by Luis García-Ballester, et al. (Cambridge: Cambridge University Press, 1994), 237–88; John Aberth, ed., *The Black Death: The Great Mortality of 1348–1350* (Boston: Bedford/St Martin’s, 2005), 50–55.
36. Demaitre, *Medieval Medicine*, 65–66; George R. Keiser, ‘Two Medieval Plague Treatises and Their Afterlife in Early Modern England’, *Journal of the History of Medicine* 58 (2003), 292–324; John Henderson, ‘The Black Death in Florence: Medical and Communal Responses’, in *Death in Towns: Urban Responses to the Dying and the Dead, 100–1600*, ed. by Steven Bassett (Leicester: Leicester University Press, 1992), 136–50.
37. Dorothea Waley Singer and Annie Anderson, *Catalogue of Latin and Vernacular Plague Texts in Great Britain and Eire in Manuscripts Written before the Sixteenth Century* (London: William Heinemann, 1950), 27–28. For a modern translation of John of Burgundy’s influential tract, see Rosemary Horrox, ed., *The Black Death* (Manchester: Manchester University Press, 1995), 184–93.
38. Ernest L. Sabine, ‘City Cleaning in Mediaeval London’ *Speculum*, 12 (1937): 19–43, on 23–24, 27–28.
39. George Shuffelton, ed., *Codex Ashmole 61: A Compilation of Popular Middle English Verse* (Kalamazoo, MI: Medieval Institute Publications, 2008), no. 31. Shuffelton’s observation that plague tracts derived from a ‘folk’ rather than an academic tradition is, however, erroneous.
40. Caroline Barron, *London in the Later Middle Ages: Government and People 1200–1500* (Oxford: Oxford University Press, 2004), 256–57, and ch. 10 generally for the urban environment.
41. Paul Strohm, ‘Sovereignty and Sewage’, in *Lydgate Matters: Poetry and Material Culture in the Fifteenth Century*, ed. by Lisa H. Cooper and Andrea Denny-Brown (Basingstoke: Palgrave Macmillan, 2008), 58–70.
42. Henry Bergen, ed., *Lydgate’s Troy Book, Part I* (Early English Text Society ES 97, 1906), Bk II, 166. Significantly, Thomas More, who was involved in pioneering measures for the introduction of quarantine in London and Oxford during the plague of 1518, stressed the cleanliness of his own model community. On the island of Utopia noxious waste was also carried away by running water, ‘for fear that the air, tainted by putrefaction,

- should engender disease': *Utopia*, in *The Complete Works of St. Thomas More, Volume 4*, ed. by Edward Surtz and Jack H. Hexter (New Haven, NJ: Yale University Press, 1965), 138–39, 418.
43. For a chronological survey of national and regional epidemics up to 1530, see Rawcliffe, *Urban Bodies*, 360–74.
 44. In London, for example, whatever ordinances were currently in force would be proclaimed in English throughout the city every year: Henry Thomas Riley, ed., *Munimenta gildhallae Londoniensis: Liber albus* (London: Longman, 1859), 260, note 1. See also Rawcliffe, *Urban Bodies*, 45–50.
 45. Gilbert, *Calendar of Ancient Records of Dublin*, 139–40.
 46. Carole Rawcliffe, 'The View from the Streets: The Records of Hundred and Leet Courts as a Source for Sanitary Policing in Late Medieval English Towns', in *Policing the Urban Environment*, ed. by Rawcliffe and Weedda, 69–95.
 47. Jacobi, *A Litill Boke*, ff. 3v, 4v; Margaret Healy, 'Discourses of the Plague in Early Modern London', in *Epidemic Diseases in London*, ed. by Justin A. I. Champion (London: Centre for Metropolitan History, 1993), 21.
 48. Avicenna maintained that the inhalation of 'air corrupted by itself or because of the proximity of lepers' might be sufficient to infect a vulnerable person with the disease: *Liber canonis*, Bk IV, f. 442v. Even so, although writers such as Bartholomaeus Anglicus reiterated this warning and advised against prolonged association with the leprous (*On the Properties of Things*, I, 424, 426), their recommendations had little discernible impact upon English urban communities until after the Black Death: Carole Rawcliffe, *Leprosy in Medieval England* (Woodbridge: Boydell Press, 2006), 92–93.
 49. Rawcliffe, *Leprosy in Medieval England*, 274–84.
 50. London Metropolitan Archives, COL/CC/01/01/008, ff. 21v–22r.
 51. Norfolk Record Office, Y/C4/147, rot. 16r. In this instance the word 'vill' refers to the entire town.
 52. Arthur Hermann Thomas, ed., *Calendar of Plea and Memoranda Rolls of the City of London, 1413–1437* (Cambridge: Cambridge University Press, 1943), 129.
 53. R. W. Chambers and Marjorie Daunt, eds, *A Book of London English 1384–1425* (Oxford: Clarendon Press, 1931), 134–35; Thomas, ed., *Calendar of Plea and Memoranda Rolls of the City of London, 1413–1437*, 157. For the importance of cleanliness as a civic ideal and the shameful connotations of dirt, see Douglas Biow, *The Culture of Cleanliness in Renaissance Italy* (Ithaca, NY: Cornell University Press, 2006), 75–94.
 54. As, for example, Thomas Forestier's tract of 1485: British Library, Additional MS 27582, p. 71.
 55. Rawcliffe, *Urban Bodies*, 6, 61–62, 99–100, 283–89, 357–58.

56. Thomas, ed., *Calendar of Plea and Memoranda Rolls of the City of London, 1413–1437*, 133–34.
57. P. E. Jones, 'Whittington's Long House', *London Topographical Record* 23 (1974 for 1972), 27–34.
58. Henry Thomas Riley, ed., *Memorials of London and London Life in the XIIIth, XIVth, and XVth Centuries* (London: Longmans, Green and Co., 1868), 677; Sir Nicholas Harris Nicolas, ed., *Proceedings and Ordinances of the Privy Council of England*, 7 vols (London: Eyre and Spottiswoode, 1834–7), vol. 3, 79–80. This was not the first attempt to safeguard the health of London's prisoners. In 1356, the moat around the Fleet prison in Holborn was cleared of noxious filth from sewers, tanneries and illegally sited latrines following a complaint by Edward III that 'by reason of the infection of the air, and the abominable stench which there prevails, many of those there imprisoned are often affected with various diseases and grievous maladies': Riley, ed., *Memorials*, 279–80; Honeybourne, 'The Fleet and its Neighbours', 39–40.
59. Margery Bassett, 'Newgate Prison in the Middle Ages' *Speculum*, 18 (1943), 233–46: 239.
60. Rawcliffe, 'Butchery and the Battle against Plague', 19; Geltner, *Roads to Health*, 7–9.
61. He expressed these views in a lecture on 'Great Cities and their Influence for Good and Evil' first given in 1857: Charles Kingsley, *Sanitary and Social Lectures and Essays* (London: Macmillan, 1889), 194–96. Ironically in 1850 Charles Dickens had personified the miasmatic air arising from England's slums as a 'perversion of the Holy Ghost', or 'profane spirit, breeding and brooding' over the entire country: Alexandra Harris, *Weatherland: Writers and Artists under English Skies* (London: Thames and Hudson, 2015), 298.
62. The authors of plague tracts generally recognised three levels of causation: the ultimate, namely God; the intermediate or universal, which involved the movement of winds and heavenly bodies; and the proximate, among which stagnant waste, rotting food and similar sources of miasmatic air ranked prominently. See, for example, Horrox, ed., *Black Death*, 159–61.

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