1666 AND LONDON'S FIRE HISTORY: A RE-EVALUATION*

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ABSTRACT. *While it is incontestable that the Great Fire led to a new awareness and to stronger measures to prevent and to fight fires, this was not because it was the worst in a long series of serious fires, but because it was one of the first. London had no really large fires in the four centuries before 1666, but was to experience fifty or more in the following 200 years. This article asks why. Alongside the obvious facts of rapid population growth and the resulting shoddy building, the continued use of timber for housing, and the inadequacy of fire prevention measures, it suggests that the growth of London's maritime trade and the concentration of stores of new types of highly flammable products, particularly along the river, created a new vulnerability to disaster that made earlier forms of fire control inadequate.*

The Great Fire of London, in 1666, is conventionally understood as both an extraordinary event and a routine one. According to a recent history of the city, 'the Great Fire that began in the early hours of September 2 was unusual only in its size, because London was always burning'.[1] Historians generally see fire as a fact of life in early modern cities, an event that people feared but could do little about. At the same time, the Great Fire was clearly extraordinary. Lasting for four days and driven by strong winds, it destroyed some 13,200 buildings, around a quarter of the entire metropolis. It was one of the most extensive urban fires in Europe's history up to that date, and is frequently identified as a key turning point in the development both of London and of modern cities in general, as the moment when the fire-prone early modern

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[1] Robert O. Bucholz and Joseph P. Ward, *London: a social and cultural history, 1550–1750* (Cambridge, 2012), p. 319. The most comprehensive history of the Great Fire, by Walter Bell, refers to 'the spectacle of fire with which the populace were unhappily familiar': *The Great Fire of London in 1666* (London, 1920), p. 1.

city began to be transformed into a new type of urban environment, one that was better constructed and safer, at far less risk of fire disasters.

I wish to suggest that 1666 marked a different kind of turning point in London's history, one where the risk and incidence of large fires increased rather than decreased. By large fires, I mean those that burned at least forty or fifty houses (contemporary estimates are often imprecise and conflicting). There is no record of London experiencing any such fires between 1212 and 1633, and it was only after the mid-seventeenth century that they became frequent and more dangerous. This was a result not only of population pressures and the consequent disregard for fire regulations and the proliferation of more fire-prone buildings, but also of the city's new and growing prominence as a centre of global trade. As has often been pointed out, the disaster shocked the authorities into introducing much stricter building regulations, leading to the reconstruction of most of the burned area in brick rather than in timber. It led to much greater fire preparedness, stimulating the purchase of new fire pumps of improved design. And it prompted, within only a few years, the introduction and widespread adoption of fire insurance. For all these reasons, and because of its psychological impact, 1666 is rightly seen as a landmark in the history of London, to the extent that still today, historians customarily write of London before or after the Fire. Yet rather than representing the catastrophic outcome of a risk that had always been there, it marked the onset of a new level of fire danger.

The idea that London and other early modern cities were always burning derives largely from a concentration on exceptional events. Recent work on urban disasters, for example, has inadvertently reinforced the perception that terrible fires happened all the time.[2] Much scholarly work qualifies this, as Christopher Friedrichs does when he points out that big fires were the exception, not the rule, but such disclaimers are often given little prominence.[3] For example, the best recent history of the Great Fire of London, by Stephen Porter, sets the scene by evoking at some length the frequency of fires in provincial towns and the inadequacy of the tools for fighting them, adding in what is almost a throwaway line at the end that except for Norwich in 1507 and Glasgow in 1652, no major city in Britain had experienced a really catastrophic fire for centuries.[4] Less scholarly histories prefer not to complicate the picture at all. Fires were common, says one recent account of the Great Fire, reminding its reader of big blazes in Dorchester in 1613, Banbury in 1628, Oxford in

    [2] See, for example, the two fine recent collections: Greg Bankoff, Uwe Lübken, and Jordan Sand, eds., *Flammable cities: urban conflagration and the making of the modern world* (Madison, WI, 2012); Martin Körner, Niklaus Bartlome, and Erika Flückiger, eds., *Stadtzerstörung und Wiederaufbau: Zerstörungen durch Erdbeben, Feuer und Wasser; Destruction and reconstruction of towns: destruction by earthquakes, fire and water* (2 vols., Bern and Vienna, 1999).
    [3] Christopher R. Friedrichs, *The early modern city, 1450–1750* (Harlow, 1995), p. 276.
    [4] Stephen Porter, *The Great Fire of London* (Godalming, 1998; first published 1996), pp. 27–8.

1644, and in London itself in 1633.[5] Such lists can easily be compiled, telescoping time and place and thereby creating the impression that fire disasters happened all the time. Yet, as Sven Lilja points out in an important article on fires in Swedish wooden towns, although there were hundreds of conflagrations in different places, few locations experienced big fires repeatedly. Forty-four medieval Swedish towns had an average of 2·6 major fires in 500 years, while another twenty-six towns had none. In the early modern period there were some 164 major urban fires, an average of 2·1 per town in 300 years, and 40 per cent of those were a result of war. Even allowing for under-reporting, it is likely that most small-town Swedes never experienced a major fire in their entire lifetime.[6]

This was probably also true of most English people. The *Gazetteer* of fires compiled by Eric Jones, Stephen Porter, and Michael Turner, often cited as evidence of the large number of fires that occurred in early modern England, identifies 518 fires that occurred in 249 English towns between 1500 and 1899 and that burned more than ten houses or caused particularly extensive damage: on average, roughly two per town over a period of 400 years. But particular locations burned a lot: Tiverton and Wapping suffered nineteen such fires each, Crediton fifteen, and Southwark thirteen. The vast majority of towns, therefore, had no more than one fire of this size recorded in these four centuries. It is clear, as Robin Pearson has recently shown, that the *Gazetteer* is far from complete even for the later period when the records are better.[7] But that is partly because many towns are missing from the record. We do not know how many places experienced no big fires at all. If we consider that the really large fires that are the subject of the present article, those that burned forty, fifty, or a hundred houses, are far more likely to appear in the sources than ones that destroyed a dozen or so, we can probably assume that the *Gazetteer* offers a fairly good compendium of major conflagrations, and therefore that disasters on this scale were relatively unusual.

I

For the City of London, at any rate, the picture is clearer. Derek Keene has pointed out that for over 400 years it experienced no really big fires. During the middle ages, there were a number of significant fires, although the

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[5] Adrian Tinniswood, *By permission of Heaven: the story of the Great Fire of London* (London, 2003), p. 47.

[6] Sven Lilja, 'Wooden towns on fire: fire destruction and human reconstruction of Swedish towns prior to 1800', in Körner, Bartlome, and Flückiger, eds., *Stadtzerstörung und Wiederaufbau*, I, pp. 255–75, at pp. 257–9.

[7] Eric L. Jones, Stephen Porter, and Michael Turner, *A gazetteer of English urban fire disasters, 1500–1900*, Historical Geography Research Group of the Institute of British Geographers, Research Paper Series, no. 13 (Norwich, 1984); Robin Pearson, *Insuring the Industrial Revolution: fire insurance in Great Britain, 1700–1850* (Aldershot, 2004), pp. 33–4.

records offer conflicting evidence on their precise extent. In 1132, however, almost the entire city was destroyed, and far more people were killed in the terrible fire of 1212, it would seem, than in the later Great Fire. After 1212, new building regulations were introduced, 'since which time', according to the 1603 edition of John Stow's *Survey of London*, 'thanks be to God, there hath not happened the like often consuming fires in this city as afore'.[8] There were several potentially dangerous fires in the sixteenth century. In November 1503, a fire on London Bridge destroyed half a dozen houses, and the following January several properties were lost on Thames Street. Henry Machyn mentions 'a grett fyre' that on 8 December 1559 destroyed the George Inn in Broad Street and 'dyd grett h[arm] to dyvers howses', but the worst blaze appears to have been one in Rood Lane in May 1538 that destroyed a dozen houses and killed nine people. Otherwise, what contemporaries referred to as 'a great fire' generally involved only one or two buildings. Another potentially disastrous blaze broke out after the spire of St Paul's was hit by lightning in 1561, but it was able to be contained. Indeed, most fires were put out before they spread.[9] Given that London is well served by chroniclers, and that the bad fires they reported are also generally noted in the repertories of the Council of Aldermen, it is unlikely that any major disasters occurred that were not recorded.

Only from the fourth decade of the seventeenth century do we have evidence of larger conflagrations. In 1633, forty-two houses burned on London Bridge, and in 1639 fifty houses were destroyed in Southwark (not fully part of London at that date). Eleven years later, an explosion and fire in Tower Street, in the parish of All Hallows Barking, destroyed forty-odd buildings and killed sixty-seven people. A 'grate fire' in Threadneedle Street in 1654 left some thirty houses in ruins, and there were similar losses in another fire in Southwark in 1655.[10] In the spring of that year there was some alarm about what seemed to be a growing number of fires, another of which had destroyed more than twenty houses.[11] This was the background to John Evelyn's statement

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[8] Derek Keene, 'Fire in London: destruction and reconstruction, A.D. 982–1676', in Körner, Bartlome, and Flückiger, eds., *Stadtzerstörung und Wiederaufbau*, I, pp. 187–211, at p. 198; John Stow, *The survey of London* (1603), ed. Henry B. Wheatley (London, 1956), p. 85. See also John Schofield, *London, 1100–1600: the archaeology of a capital city* (Sheffield, 2011), p. 88.

[9] John Entick, *A new and accurate history and survey of London, Westminster, Southwark, and places adjacent* (4 vols., London, 1766), I, p. 445; *Diary of Henry Machyn, citizen and merchant-taylor of London, from A.D. 1550 to A.D. 1563*, ed. John Gough Nichols (London, 1898), p. 219; Stow, *Survey*, p. 188; John Hayward, *Annals of the first four years of the reign of Queen Elizabeth*, ed. John Bruce (London, 1840), pp. 87–8.

[10] Keene, 'Fire in London', pp. 193–8; Bell, *Great Fire*, p. 25; Lilian J. Redstone, *The church of All Hallows Barking*, vol. XII of *Survey of London* (London, 1929), p. 45; Nehemiah Wallington, *The notebooks of Nehemiah Wallington, 1618–1654: a selection*, ed. David Booy (Aldershot, 2007), pp. 104–9, 112, 113.

[11] *The diary of John Evelyn*, ed. Esmond Samuel De Beer (6 vols., Oxford, 1955), III, p. 150 n. 4.

that a whole street burning was 'an accident not unfrequent in this wooden City', and to his condemnation of 'Buildings…as deformed as the minds & confusions of the people'.[12] But other people remained unconcerned. In 1658, James Howel could assert that 'There's no place…better armed against the fury of the fire', pointing to the new fire engines the city had recently acquired.[13] With hindsight, we can see the Great Fire as a disaster waiting to happen, but if many Londoners were complacent in 1666, it was because they had until recently experienced very few big fires and no catastrophic ones.

After 1666, this changed. The Great Fire was one of the first, though by far the most devastating, in a series of large fires (if we consider the whole metropolitan area and not only the City). Southwark experienced another one in 1667, and an even greater disaster in 1676 when an estimated 600 houses were destroyed. In 1673, nearly 100 houses burned down in Shadwell, in the suburbs to the east, and a big fire at Wapping in 1682 was said to have destroyed 1,000 houses (although the figure is suspiciously rounded, it was clearly a very large conflagration). Further sizeable fires took place in Southwark in 1681 and 1689, while in 1698, Whitehall Palace and about 150 houses burned.[14] Eighteenth-century London also had its share of big fires, although most were not on the same scale. Even so, fires in the City in 1715, 1748, and 1765 each destroyed close to 100 houses, perhaps more, and that of 1794 in Ratcliff burned some 453 houses. Smaller blazes resulting in the loss of thirty to fifty houses took place in 1708, 1731, 1735, 1759, 1781, 1783, and in two areas in 1799. Several others destroyed 'many houses'.[15] Only after the 1830s did these conflagrations, which destroyed entire streets and neighbourhoods, largely cease, although there were still some very big fires affecting large single buildings and complexes of warehouses, such as the immense Tooley Street fire of 1861 in Bermondsey.[16] In London's long-term fire history, therefore, 1666 came not at the end of a long series of bad fires, but towards the beginning. Certainly, these later fires, with the exception of the Great Fire itself, destroyed less of the metropolis than those of the medieval period. Yet in terms of the damage done or even in relation to the size of the city, they were far more serious than any of the fires we know of during the fifteenth and sixteenth centuries. By the mid-eighteenth century, London's population and area were perhaps four or five times larger than in 1550, yet most of the

[12] John Evelyn, *A character of England as it was lately presented in a letter to a noble man of France* (London, 1659), p. 29.
[13] James Howel, *Londinopolis* (London, 1657), p. 398.
[14] *Sad and lamentable news from Wapping giving a true and just account of a most horrible and dreadful fire, which happened on Sunday the 19th. of Nov. 1682* (London, 1682); London Metropolitan Archives (LMA) CLA/040/02/007; Porter, *Great Fire*, p. 155; Anna Milford, *London in flames: the capital's history through its fires* (West Wickham, 1998), p. 72; Geoffrey Vaughan Blackstone, *A history of the British fire service* (London, 1957), p. 55.
[15] Jones, Porter, and Turner, *Gazetteer*, p. 46; Peter Guillery, *The small house in eighteenth-century London: a social and architectural history* (London and New Haven, CT, 2004), p. 46.
[16] P. G. M. Dickson, *The Sun Insurance Office, 1710–1960* (London, 1960), p. 129.

later fires destroyed over ten times as many houses as the biggest of the ones that occurred between 1212 and 1633.

<div align="center">II</div>

Why should the metropolis have had so few serious fires for centuries, then so many in the space of 200 years? One possible explanation is that there was a rise in the overall number of fires, with more small fires leading to more large ones. At first glance, this seems plausible. It is highly likely that as the urban area expanded and population densities grew, more small fires did break out, each destroying one or two houses. Pearson's analysis reveals that this happened in the early nineteenth century, when the total number of fires in London grew in proportion to the growth in housing. Unfortunately, we cannot test this statistically for the earlier period, when neither fire insurance nor fire brigade records are complete and when press reports are an unreliable guide. Pearson notes that even during the eighteenth century, when the press routinely noted many smaller fires, there is a noticeable dip in such reports during the American War when other topics took precedence.[17] Nevertheless, it is more than likely that even in per capita terms there were more small fires. Domestic fireplaces, which started many small fires when sparks set fire to furnishings or clothing, became far more widespread in the eighteenth century.[18] Transformations in social practices also increased the risk of fire. Tobacco smoking spread to all social groups in the course of the seventeenth century, and appears to have started many fires. Growing use of the night hours has been documented in a number of fine studies, and led to fire being used for lighting, heating, and cooking around the clock.[19] Drunkenness may have increased as gin became readily available in the early eighteenth century, and certainly contributed to outbreaks of fire. Of course, the accusations made against smokers and drunkards, like those against servants and arsonists, reflect social anxieties, so here too we need to be cautious.[20]

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[17] Pearson, *Insuring*, pp. 34, 58–9.

[18] Guillery, *Small house*, pp. 40, 72. For examples from Middlesex coroners' reports, LMA MJ/SP/C/W/0147–191.

[19] For the early modern period, see particularly Alain Cabantous, *Histoire de la nuit: XVIIe–XVIIIe siècle* (Paris, 2009), and Craig Koslofsky, *Evening's empire: a history of the night in early modern Europe* (Cambridge and New York, NY, 2011).

[20] LMA COL/SJ/02/029–031, 6 Anne c. 31, §3, 8 June 1708, reissued by Court of Common Council, 24 Mar. 1725 and 19 Apr. 1748; LMA ACC/0076/0334, poster concerning the negligence of servants, issued by County Fire Office, n.d. [early nineteenth century], advertising Building Act, 14 Geo. III, c. 78, §84; Pearson, *Insuring*, p. 84. On arson, Dickson, *Sun Insurance*, pp. 141–3; Pearson, *Insuring*, pp. 35–6. The classic study is Robert Scribner, 'The *mordbrenner* fear in sixteenth-century Germany: political paranoia or the revenge of the outcast?', in Richard J. Evans, ed., *The German underworld: deviants and outcasts in German history* (London, 1988), pp. 29–56.

Yet if we suppose that more small fires did occur in the seventeenth and eighteenth centuries than in the sixteenth, did they inevitably produce more large ones? In the earlier period, small fires are very poorly recorded, but there were undoubtedly many that destroyed one or two houses, and yet hardly any of them spread. The key question remains, therefore, why after the 1630s, some small fires were becoming large ones when before that they did not. The focus must be on the reasons why a fire in a single house or workshop was able to spread to adjoining buildings and eventually consume an entire neighbourhood.

Historians have focused on what we might call endogenous factors, forms of construction, of preparedness, and of urban government. Derek Keene argues that the medieval fire regulations were very effective and that they largely explain the absence of large fires after the early thirteenth century. They encouraged construction in stone, mandated the use of fireproof materials for roofing, and required flammable materials on the walls to be plastered over, particularly in high-risk locations such as kitchens, bake-houses, and breweries. Keene emphasizes the construction of stone party walls between adjoining houses, which prevented fires from spreading so easily. Subsequently, though, it became common to pierce holes in the firewalls, and dangerous wooden buildings again multiplied as the population of London began to grow rapidly. Whereas the population had fallen at the end of the middle ages, reducing pressure on housing, after the late sixteenth century, the number of inhabitants in the metropolis again grew rapidly, from around 120,000 in the late sixteenth century to at least 400,000 by the mid-seventeenth century, once more increasing population densities.[21] Demand for housing often led to poor-quality construction in the courtyards of the old City and along the river. This is borne out by both archaeological and documentary evidence. By the mid-seventeenth century, much of London was again built in wood, with jetties and wooden projections, and in the centre, the houses were taller than ever before, up to six storeys, which put the upper floors beyond the reach of the fire pumps. Thousands of buildings were condemned by the authorities for their poor construction, including (in the words of the royal proclamation of 1620) 'Sheds of Timber, with Reeds, Faggots, Hay, Straw, Boards, or other materials', but it seems that many were allowed to subsist after payment of a fine.[22] If this was already the case in 1620, we might wonder why it was another thirty years and more before bad fires began breaking out. Perhaps the fact that much of the construction was in oak, which does not catch fire easily, that many of the house roofs were tiled, and that plaster probably covered many external walls,

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[21] Keene, 'Fire in London', p. 193; Porter, *Great Fire*, pp. 16–19. On population figures, Vanessa Harding, 'The population of London, 1550–1700: a review of the published evidence', *London Journal*, 15 (1990), pp. 111–28.

[22] William C. Baer, 'Housing the poor and mechanick class in seventeenth-century London', *London Journal*, 25 (2000), pp. 13–39, at pp. 17–18, see also pp. 20–2; Guillery, *Small house*, pp. 40–8.

at least in the main streets, helps explain why there were few large fires before 1666.[23]

Nevertheless, the continued proliferation of shoddy timber constructions is without doubt one reason why fires were able to spread after the middle of the seventeenth century. Evelyn's observation about the 'deformed' nature of the buildings has already been quoted. Since the Great Fire destroyed only around one quarter of the total built-up area of the metropolis, many areas remained unaffected by the rebuilding. The 1667 Rebuilding Act applied only to the City, and insurance records show that outside that area large numbers of wooden buildings existed, and indeed continued to be constructed, until at least the end of the eighteenth century. They were the norm in much of the area south of the river and in many of the suburbs. The regulations did not apply to the entire metropolis until the Building Act of 1774, whose text noted the disregard of earlier legislation and condemned the common practice of adding upper storeys of timber to brick buildings.[24] The poor design of many houses, as well as the materials of which they were constructed, led to growing insurance losses across the 1700s. The most serious fires after 1666 occurred in the areas outside the City, although even there bad fires still occurred. Eighty houses burned in Thames Street in 1682 and perhaps 100 in 1715. Large areas around Cornhill burned in 1748, 1759, and 1765, no doubt in part because the much-trumpeted regulations were often ignored, as Elizabeth McKellar and Peter Guillery have shown. And even houses rebuilt in brick continued to have frames, floors, roofs, internal furnishings, and panelling, and sometimes rear walls of wood. There is in fact evidence of increasing use of timber in some buildings up to the 1780s. The wood used, furthermore, was generally now pine or fir, rather than the more fire-resistant oak that had become scarce by the late seventeenth century. These houses burned almost as well as the older timber-clad ones. Although brick outer walls might better contain a fire, so that it did not spread so easily to adjoining houses, the bricks used were often shoddy and easily toppled. Furthermore, even in the central areas outbuildings were frequently made of wood. As Nicholas Hawksmoor complained in 1715, London was 'a Chaos of Dirty Rotten Sheds, allways Tumbling or takeing fire'.[25]

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[23] Schofield, *London, 1100–1600*, p. 241; Neil Hanson, *The Great Fire of London in that apocalyptic year, 1666* (London, 2001), p. 9.

[24] Pearson, *Insuring*, 58–60; Robin Pearson, 'The impact of fire and fire insurance on eighteenth-century English town buildings and their populations', in Carole Shammas, ed., *Investing in the early modern built environment: Europeans, Asians, settlers and indigenous societies* (Leiden, 2012), pp. 67–93, at pp. 74–8, 90–2; Schofield, *London, 1100–1600*, pp. 242–9; Guillery, *Small house*, pp. 70, 127, 65, 282–3, see also figs. 48, 109, 110, 112, 141, 145.

[25] Pearson, *Insuring*, pp. 60, 85; Hawksmoor to George Clarke, quoted in Elizabeth McKellar, *The birth of modern London: the development and design of the city, 1660–1720* (Manchester, 1999), p. 30; Guillery, *Small house*, pp. 52, 70–3. For an example where wooden outbuildings contributed to a fire in St Bartholomew's Close (next to today's Barbican) in 1768, LMA ACC/1017/1029.

If the forms and density of construction and the disregard for building regulations provide one explanation for the long-term pattern, we also need to consider the efficacy of fire-fighting. Admittedly, the equipment was primitive by modern standards. Yet fires did break out between 1212 and the 1630s, and the records indicate that small ones could be extinguished with the help of leather buckets, hand-held metal syringes, and later of small, portable fire-pumps, especially when all the neighbours mobilized to supply water. For example, Holinshed's *Chronicles,* originally published in the late sixteenth century, speak of 'a perillous fier at the signe of the panier upon London bridge, neere to saint Magnus church', in 1504 and tell us that 'six tenements were burned yer the same could be quenched'.[26] Henry Machyn's *Diary* records another fire in Watling Street in 1563, commenting that 'yf that ther had not bene good helpe yt had done myche hurt'.[27] I have already mentioned the fire at St Paul's in 1561, which was prevented from spreading to the entire roof or to the surrounding buildings. On that occasion, the authorities resorted to pulling down some of the nearby houses to create a firebreak.[28] Here, too, the form of construction was again important, since before the seventeenth century the houses in the City were smaller, and in serious cases more easily demolished. But in general, house fires were controlled before they did too much damage.

The evidence from the seventeenth and eighteenth centuries suggests that fire-fighting continued to be effective in many cases, particularly for smaller house fires. After the 1670s, new types of pumps, better training of fire-fighters, and new forms of organization designed to facilitate earlier intervention, particularly with the introduction of the insurance company fire brigades after the late seventeenth century, certainly improved the capacity to contain and extinguish fires. In 1768, John Eliot described how a fire engine eventually extinguished a nasty fire in Bartholomew Close that destroyed and damaged a number of houses, fuelled by 'a great Deal of slight Timber Building'.[29] Even the much-maligned parish fire engines were prompt to attend some fires, and seem to have been effective. Improved fire-fighting is the most likely explanation for the apparent sharp drop in the average size of all fires that Pearson observes in the second half of the eighteenth century.[30]

On the other hand, fire-fighting was sometimes hindered by shortages of water. As the population grew and demand for water with it, the London

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[26] *Holinshead's Chronicles of England, Scotland, and Ireland* (6 vols., London, 1807–9), III, p. 532.

[27] *Diary of Henry Machyn,* p. 309, 13 June 1563. Machyn also records a fire at Holborn in 1559 and at Barbican in 1563 at pp. 211, 308.

[28] Entick, *New and accurate history,* II, p. 50.

[29] LMA ACC/1017/1029; Brian Wright, *Insurance fire brigades, 1680–1929: the birth of the fire service* (Stroud, 2008).

[30] Pearson, *Insuring,* p. 34. On parish fire engines, LMA Q/SHR/91, LMA P69/EDK/B/032/MS20396.

water table fell, leading some wells to dry up. At the same time, following the shift in the late seventeenth and eighteenth centuries to piped water provided by private companies, it often took time to find the turncocks who could provide access to the pipes. This was further complicated by frequent interruptions to the flow in the pipes. An Act of Parliament of 1707 stated that many recent fires could have been prevented or limited if water had been available, and in the big Southwark fire of 1785, when several acres of housing and warehouses were destroyed, it was two hours before the fire engines could obtain any water. This remained an issue even in the early nineteenth century. In this and other respects, there were certainly suggestions that London's fire service did not compare favourably with that of Amsterdam.[31]

III

Alongside the nature of the buildings, the inadequacy of preventive measures, and the mixed record of fire-fighting, there were other factors that contributed to the likelihood of big fires. John Strype's *Survey of London* (1720) suggests what some of these might be. He offers ten key reasons why the Great Fire of 1666 occurred in the way it did, and subsequent histories have largely repeated these, although with varying degrees of emphasis. In addition to the type of building – the densely packed wooden buildings and the jettied houses overhanging already narrow streets – Strype mentions several short-term, contingent causes, such as the time of day and of the year, the nonchalance and even incompetence of the authorities, and the unexpected failure of the water supply.[32] Yet none of these explains the longer-term pattern of serious fires described above. He also points to the hot, dry weather, 'which had so dried the Timber, that it was never more apt to take Fire'. This too was a short-term factor, but in the light of recent work it is worth considering the impact of climatic change. The period of increasingly serious fires, from the mid-seventeenth to the late eighteenth century, coincides with the final stage of

[31] Metropolitan Water Board, *The water supply of London* (London, 1949), p. 32; Blackstone, *British fire service*, pp. 61, 78, 158; Rosemary Weinstein, 'New urban demands in early modern London', in W. F. Bynum and Roy Porter, eds., *Living and dying in London* (London, 1991), pp. 29–40, at pp. 34, 39; Pearson, *Insuring*, pp. 79, 83–4; W. S. Lewis, ed., *The Yale edition of Horace Walpole's correspondence* (48 vols., London, 1937–83), xxv, p. 577 and n. 5, Walpole to Mann, 7 May 1785. The best study of London's water supply is Carry van Lieshout, 'London's changing waterscapes – the management of water in eighteenth-century London' (Ph.D., London, 2012). I am grateful to Carry van Lieshout for allowing me to read her excellent thesis. Mark S. R. Jenner, 'From conduit community to commercial network? Water in London, 1500–1725', in Paul Griffiths and Mark S. R. Jenner, eds., *Londinopolis: essays in the cultural and social history of early modern London* (Manchester, 2000), pp. 250–72. On Amsterdam, the best source, despite its self-promotional tone, remains Jan van der Heyden, *A description of fire engines with water hoses and the method of fighting fires now used in Amsterdam*, trans. and introd. by Lettie Stibbe Multhauf (Canton, MA, 1996; orig. publ. 1690).
[32] John Strype, *A survey of the cities of London and Westminster* (2 vols., London, 1720), i, pp. 227–8.

the so-called 'Little Ice Age', which seems to have produced not only colder conditions overall, but also considerable climatic instability, what climate historians refer to as 'anomalies'. Recent work by Cornel Zwierlein has revealed that in the German-speaking cities the exceptionally hot, dry summers of 1540 and 1666 witnessed the worst fire disasters of the entire millennium, if those caused by wars are excluded.[33] The 1680s again experienced fairly warm summers, and this might have contributed to the two bad fires in London in that decade, although one of those took place in November. The first half of 1794 was, in much of Europe, unusually hot, so may have prepared the way for the terrible Ratcliff fire of July that year. However, other bad fires do not appear to coincide with particularly hot or dry periods, and the first decade of the nineteenth century, which in much of Europe experienced unusually warm summers, saw no particularly bad fires in London.[34] At the other extreme, in 1633, 1678, 1838, and possibly on other occasions, freezing conditions contributed to some fires by making water hard to obtain and clogging the fire pumps with ice.[35] Climatic conditions were clearly important contributing elements in some fires, and go some way to explaining the sudden increase in serious fires, but do not account for them all.

Some historians have noted, but rarely given much weight to, another explanatory factor offered by Strype. 'The nature of the Wares and Commodities stowed and vended in those Parts', he says, 'were the most Combustible of any other sold in the whole City: As Oyl, Pitch, Tar, Cordage, Hemp, Flax, Rosin, Wax, Butter, Cheese, Wine, Brandy, Sugar, &c.'.[36] Contemporary accounts confirm this, describing how the fire 'laid hold on Thames-Street, the Repository of all Combustibles, as Butter, Cheese, Wine, brandy, Sugar, Oyl, Hemp, Flax, Rosin, Pitch, Tar, Brimstone, Cordage, Hops, Wood, and Coals'. When the fire reached Thames Street, wrote another eye-witness, it met 'with nothing by the way but old paper buildings and the most combustible matter of Tarr, Pitch, Hemp, Rosen, and Flax which was all layd up thereabouts so that in six hours it became a huge stream of fire at least a mile long and could not possibly be approach'd or quencht'.[37] It was not only the building materials that put this

[33] Cornel Zwierlein, *Der gezähmte Prometheus: Feuer und Sicherheit zwischen Früher Neuzeit und Moderne* (Göttingen, 2011), p. 108.

[34] Joyce Macadam, 'English weather: the seventeenth-century diary of Ralph Josselin', *Journal of Interdisciplinary History*, 43 (2012), pp. 221–46, at p. 237; Christian Pfister, *Klimageschichte der Schweiz: 1525–1860; das Klima der Schweiz von 1525–1860 und seine Bedeutung in der Geschichte von Bevölkerung und Landwirtschaft* (3rd edn, 2 vols. in 1, Bern and Stuttgart, 1988); Gordon Manley, 'Central England temperatures: monthly means 1659 to 1973', *Quarterly Journal of the Royal Meteorological Society*, 100 (1974), pp. 389–405; Emmanuel Le Roy Ladurie, *Histoire humaine et comparée du climat* (2 vols., Paris, 2004–6), II, p. 197 and passim.

[35] Gideon Harvey, *An historical narrative of the great and terrible Fire of London, September 2nd 1666* (London, 1769), p. 74; J. Bruce Williamson, *History of the Temple* (London, 1924), p. 525; Wright, *Insurance fire brigades*, p. 31.

[36] Strype, *Survey*, I, p. 227.

[37] Quoted in William Maitland, *The history and survey of London from its foundation to the present time* (2 vols., London, 1754), I, p. 437. Unknown correspondent to Lord Conway, undated

part of London at risk, therefore, but also the contents of the houses, warehouses, and cellars. Already, the fire that started in a baker's shop in a crowded neighbourhood had been dramatically accelerated by the explosion of barrels of tar stored in the cellar of a ship-chandler in Pudding Lane. Once it spread into the dockside area, it 'took deep root', as Roy Porter notes. It became a Great Fire, against which even the measure of last resort, blowing up houses to create fire-breaks, worked only after the wind had dropped.[38]

The presence of flammable goods reflects the long-term vocation of this part of London. Derek Keene stresses the continuities, pointing out that the shipping-related trades and goods along the waterfront and around the end of London bridge had made this the most likely place for fires to occur ever since the middle ages. In this sense, the Great Fire conforms to a long-established pattern. Nevertheless, the recent growth in trade meant that by 1666 the quantities of flammable goods were far larger.[39] This is clear if we consider the items in Strype's list of 'Wares and Commodities'. Flax and linen, for instance, were imported to London in growing quantities, in the second half of the seventeenth century, from Germany and Holland. Much was for the domestic market, but a steadily increasing volume was re-exported to the rapidly expanding North American and Caribbean colonies.[40] Yet flax was also used for sailcloth, and indeed many of the other products mentioned by Strype and others were linked to shipping. Rope for the rigging and moorings was made from hemp. Tar was produced from the sap of pine trees, and was painted on ropes to stop them rotting. Pitch was made by boiling down tar and was applied to the hulls of ships and boats to waterproof the timber. It was also used to waterproof timber used for houses, and some of the poorer housing on Fish Street was coated with it.[41] Mixed with hemp fibres, it served to caulk the seams of wooden boats and ships, as well as to waterproof wooden barrels that were used to store or transport liquids. Tar, pitch, hemp, and flax, but also rosin and turpentine (both also used for waterproofing), were stored near the river because they were primarily for the building and maintenance of shipping, but also simply because that was where they arrived, being mostly imported from northern Europe, along with timber for masts and yards.[42]

[Sept. 1666], in Marjorie Hope Nicolson and Sarah Hutton, eds., *The Conway letters: the correspondence of Anne, Viscountesse Conway, Henry More, and their friends, 1642–1684* (revised edn, Oxford, 1992), p. 276.

[38] Hanson, *Great Fire*, pp. 49–50; Roy Porter, *London, a social history* (London, 1994), p. 85; Porter, *Great Fire*, p. 54.

[39] Keene, 'Fire in London', pp. 194, 199.

[40] David Ormrod, *The rise of commercial empires: England and the Netherlands in the age of mercantilism, 1650–1770* (Cambridge, 2003), pp. 143–4.

[41] Robert B. Outland III, *Tapping the pines: the naval stores industry in the American South* (Baton Rouge, LA, 2004), pp. 5–6; Bell, *Great Fire*, pp. 329, 331.

[42] Ralph Davis, *The rise of the English shipping industry in the seventeenth and eighteenth centuries* (London, 1962), pp. 19–20, 219; Jacob M. Price, 'What did merchants do? Reflections on British overseas trade, 1660–1790', *Journal of Economic History*, 49 (1989), pp. 267–84, at p. 274.

With the huge expansion of British overseas trade in the seventeenth century, shipbuilding boomed and demand for all these flammable substances multiplied. The tonnage of England's merchant fleet more than doubled between 1582 and 1629, then almost tripled again by the 1680s, and almost half of the new shipping was London-owned. The growth was perhaps helped by the Navigation Acts of 1650–1, 1660, and 1663, which required all trade with English colonies to be undertaken by English ships. The Royal Navy too, independently of the merchant ships that were commandeered in time of conflict, had begun to expand during the wars with the Dutch in 1652–4.[43] A significant proportion of all these ships was built and maintained on the Thames, and the areas of the metropolis that specialized in this industry were particularly fire-prone. Significantly, Wapping experienced its first really big fire in 1657, then two more in 1673 and 1682.[44]

Also linked to colonial shipping, although closely aligned with the demands of war, were gunpowder and its constituent elements, most of which were imported. Gunpowder had already caused one of the few major City fires before 1666, when seven barrels stored at a ship-chandler's shop exploded in January 1650. Central to the manufacture of gunpowder was saltpetre from Asia: the first supplies from India arrived in London in 1626 and growing quantities were imported in the following decades, though the greatest expansion came after the Civil War. In the 1630s, the East India Company was shipping some 200 tons a year, but in 1665 it brought 659 tons to London. Saltpetre was also used in medical treatments and for dyeing and engraving, and in larger quantities by gold refiners and, during the Restoration, by glass-makers.[45] The East India Company's saltpetre warehouse was, according to one author, one of the casualties of 1666, contributing directly to the inferno. Certainly, in the seventeenth century saltpetre was stored in the City, close to the river.[46] So too was the 'brimstone' mentioned above, which we know as sulphur. It was almost certainly imported from Italy and was also used in gunpowder, as well as for the fireworks whose availability and popularity are demonstrated by repeated bans (especially in the lead-up to what was later called Guy Fawkes Day).[47]

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[43] Davis, *Rise of English shipping*, pp. 10, 15, 27, 304; Bucholz and Ward, *London*, p. 87.

[44] Jones, Porter, and Turner, *Gazetteer*, pp. 16–26, 40.

[45] Redstone, *All Hallows Barking*, p. 45; K. N. Chaudhuri, *The English East India Company: the study of an early joint-stock company, 1600–1640* (London, 1965), p. 189; David Cressy, *Saltpetre, the mother of gunpowder* (Oxford, 2013), pp. 31–2, 91, 140. On continuing imports of saltpetre from India, see K. N. Chaudhuri, 'The English East India Company', in Jaap R. Bruijn and Femme S. Gaastra, eds., *Ships, sailors and spices: East India companies and their shipping in the sixteenth, seventeenth and eighteenth centuries* (Amsterdam, 1993), pp. 49–80, at pp. 61–3.

[46] Bell, *Great Fire*, p. 81. I have been unable to confirm the location of the East India Company's saltpetre warehouse. In the early 1670s, significant stocks were kept both at Woolwich and in the Minories, just outside the area burned in the Great Fire: Cressy, *Saltpetre*, p. 139.

[47] Gerald Kutney, *Sulfur: history, technology, applications & industry* (2nd edn, Toronto, 2013), p. 44; LMA COL/CA/01/02/004, fo. 2 (1630). After 1666, squibs were banned almost every year: LMA COL/SJ/27/002–008.

Several other products mentioned as contributors to the Great Fire were also imported in growing quantities. The oil may have been olive oil from France and Italy, while brandy came via Holland. Ever-larger quantities of both, together with other spirits, butter, and cheese, were imported both for domestic consumption and for re-export to the colonies.[48] Rum, of course, came in the other direction. All of these liquids were less flammable than hemp or gunpowder, but once vaporized by the heat of a fire would explode and contribute greatly to its intensity. Other types of oil – mainly from rape, linseed, and flax – had burned in the 1655 fire in Southwark, along with pepper from the East Indies, and in 1666 Samuel Pepys wrote of the 'oil-cellars' he saw still burning after the houses were gone, when he climbed the church tower of All Hallows Barking in order to view the destruction. The cellar of the Clothworkers' Hall continued to burn for three days because it was full of stores of oil.[49]

But the change that had taken place across the sixteenth and early seventeenth centuries was not simply one of scale. The mid-seventeenth century saw huge growth in new commodities and industries. The most important was sugar, also highly flammable. Demand exploded as prices fell following British acquisition of Bermuda (1612), Barbados (1627), and Jamaica (1655). Imports into London increased sevenfold between 1640 and the 1660s, from 26,355 to 183,578 hundredweight.[50] Refining of sugar grew rapidly in London after the 1640s, although a significant proportion of the raw sugar was re-exported to Europe, which meant that it too was warehoused close to the docks. Since the sugar ships arrived mainly in late summer, there may have been larger quantities there at the time of the Great Fire than at other times of the year.[51]

Along with sugar, and small but increasing quantities of cotton, by far the most important Atlantic import was tobacco, whose consumption had also risen dramatically in the middle decades of the century. In 1622, some 61,000 pounds of tobacco arrived in the port of London, and by the 1660s over eight million pounds were coming in each year, eleven million by the mid-1670s. Like sugar, it arrived mainly in summer, and it too burned easily: the leading importer was said to have lost 20,000 pounds of it in the Great

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[48] Chaudhuri, *English East India Company*, p. 189; Nuala Zahedieh, *The capital and the colonies: London and the Atlantic economy, 1660–1700* (Cambridge, 2010), pp. 253–5; L. M. Cullen, *The brandy trade under the ancien regime: regional specialisation in the Charente* (Cambridge, 1998), pp. 4–5.

[49] *Diary of Samuel Pepys*, ed. Richard Griffin Braybrooke (2 vols., London and New York, NY, 1879; orig. publ. 1825), 5 and 6 Sept. 1666.

[50] Ben Coates, *The impact of the English Civil War on the economy of London, 1642–1650* (Aldershot, 2004), p. 182; Bucholz and Ward, *London*, p. 87; also Robert Brenner, *Merchants and revolution: commercial change, political conflict, and London's overseas traders, 1550–1653* (Princeton, NJ, 1993), p. 43.

[51] Zahedieh, *The capital and the colonies*, pp. 142, 218.

Fire.[52] Another valuable overseas product was silk, one of the most flammable fabrics, and it too was part of a growing industry during the Restoration. Around 120,000 pounds came up the Thames each year around 1620, but over 302,000 pounds by the early 1660s. Again, it was sold partly into a growing domestic market, but much of it, having been processed and sometimes woven in London, was exported to Spain, Portugal, and the colonies.[53]

A relatively new import was hops, which were more and more often added to beer. The brewing industry itself was growing fast: the number of brewers in London and Westminster went from around thirty in the late 1500s to nearly 200 by the end of the following century. Many of the breweries were located along the Thames, where the dried hops and malt they contained, both flammable, contributed to the disaster of 1666.[54] So, of course, did stores of wood, charcoal, and coal. These had long been used in London for domestic and industrial uses, but 'sea-coal' – brought mainly from Newcastle – was now in demand for an ever-growing range of manufacturing processes, including brewing, dyeing, and sugar refining, and for making bricks, soap, candles, and glass, all industries that expanded rapidly during the seventeenth century. Imports of coal therefore grew from under 30,000 tons in 1580 to 340,000 tons in 1670–1. It was not so much the burning of coal that represented an increased fire risk, but the extra fuel it provided if a large fire did break out: nearly two months after the Great Fire, coal was found still burning in London cellars.[55]

Very significant economic changes had thus taken place before 1666, yet the growth in maritime trade and associated industries was just beginning. London's imports and exports boomed in the late seventeenth and across the eighteenth century, and with them the shipping industry and all its associated hazardous materials. The weight of imported flax and hemp, which were not only for ships of course, increased by 70 per cent between 1699–1701 and 1752–4, while that of pitch and tar, now from North America rather than the Baltic, had tripled. The silk industry flourished as Huguenot refugees settled in East London and Kent, fuelling further large increases in imports of raw silk. Saltpetre arrivals boomed in times of war, which included much of the eighteenth century and the early nineteenth, with imports by the East India Company averaging 943 tons per year in the late 1750s, over 1,600 tons per year in the 1760s and 1770s, and 2,285 tons per year in 1780–9.[56] Demand

[52] Coates, *Impact of the English Civil War*, pp. 10–12, 87; Zahedieh, *The capital and the colonies*, pp. 57, 64, 143; Brenner, *Merchants and revolution*, p. 113.

[53] Zahedieh, *The capital and the colonies*, p. 267; Brenner, *Merchants and revolution*, p. 25.

[54] Ian S. Hornsey, *A history of beer and brewing* (Cambridge, 2003), p. 371; Steve Rappaport, *Worlds within worlds: structures of life in sixteenth-century London* (Cambridge, 1989), p. 143; John Hatcher, *The history of the British coal industry*, I: *Before 1700: towards the age of coal* (Oxford, 1993), pp. 439–41; Bell, *Great Fire*, p. 227.

[55] Hatcher, *British coal industry*, pp. 440–502; Bell, *Great Fire*, p. 175.

[56] Christopher J. French, '"Crowded with traders and a great commerce": London's domination of English overseas trade, 1700–1775', *London Journal*, 17 (1992), pp. 27–35; Davis, *Rise of*

for sugar went from 26·2 million pounds a year in the late 1660s to 92·6 million
by the late 1720s, and continued to grow after that. Distilling too became a
major industry, particularly after the trade was thrown open in the early eight-
eenth century, and according to the London magistrates the many stills caused
frequent serious fires.[57] Tobacco was imported in ever-larger quantities. More
and more coal was used by a wider range of industries. Even the manufacture
of tallow candles boomed, both for domestic use and initially for the new
street lighting introduced in the late seventeenth century, though it was soon
supplanted there by oil. The cotton industry, of course, flourished in the eight-
eenth century, and imports of raw cotton grew exponentially. Glass-making and
soap manufacturing, minor industries before the Great Fire, became very sign-
ificant in the following century.[58]

   The growth of many of these industries was fuelled by rising consumer
demand both in London and elsewhere in Europe and the colonies. That
demand also increased the number of flammable items to be found in domestic
interiors. By the 1690s and early 1700s, growing quantities of wooden furniture
and of fabrics 'crept into our Houses, our Closets, and Bedchambers', as Defoe
later observed: 'Curtains, Cushions, Chairs, and at last Beds themselves were
nothing but Callicoes or Indian Stuffs'.[59] The evidence of inventories indicates
the growing presence, in the homes of 'the middling sort', of a wide range of
new items, including curtains, as well as a variety of imported products that
were readily obtainable in London.[60] The accumulation of furnishings, the pro-
liferation of wooden panelling, and the stocks of sugar, tallow, oil, spirits, coal,
and wood in households all provided additional fuel for house fires.

I V

Some of the many serious conflagrations that London now experienced arose
within the hazardous industries, through careless manipulation of flammable
products or faulty furnaces. The huge fire at Ratcliff in 1794 began when a

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English shipping, pp. 183–4; K. N. Chaudhuri, *The trading world of Asia and the English East India
Company, 1660–1760* (Cambridge, 1978), pp. 343–53; Cressy, *Saltpetre*, p. 147.
   [57] Bucholz and Ward, *London*, p. 89; M. Dorothy George, *London life in the eighteenth century*
(Harmondsworth, 1966; first publ. 1925), pp. 42–3.
   [58] Hatcher, *British coal industry*; Randall Monier-Williams, *The tallow-chandlers of London* (4
vols., London, 1970–7), III, pp. 90–112; Beverly Lemire, *Fashion's favourite: the cotton trade and
the consumer in Britain, 1660–1800* (Oxford, 1991). See the survey of the London economy,
1680–1730, in Peter Earle, *The making of the English middle class: business, society and family life
in London, 1660–1730* (London, 1989), pp. 17–51.
   [59] Daniel Defoe, *A review of the state of the British nation*, IV, p. 606, 31 Jan. 1708.
   [60] Lorna Weatherill, *Consumer behaviour and material culture in Britain 1660–1760* (2nd edn,
London and New York, NY, 1996), pp. 8, 25–8, 48–51; Earle, *Making*, pp. 292–300. See also
Guillery, *Small house*, p. 9. This was not confined to London: Jan de Vries, *The industrious revo-
lution: consumer behaviour and the household economy, 1650 to the present* (Cambridge, 2008),
pp. 122–85.

pot of pitch boiled over and set alight a barge loaded with saltpetre. Over 600 houses were destroyed, as well as other buildings, including the new East India Company saltpetre warehouse constructed in 1755.[61] More typical was the smaller but still dangerous fire in Wapping in 1718, which started in a pitch and tar warehouse and destroyed fourteen houses, damaging several more. Another conflagration, in Southwark in May 1785, started in a turpentine warehouse and burned four dwelling-houses and six adjacent warehouses filled with tar, pitch, and rosin.[62] Further big fires between the 1740s and the 1760s began in a dye-house, an oil shop, a glass manufactory, a distillery, at least three in breweries, and two more in shipyards following accidents with pitch.[63] Among the insurance claims paid by the Fire Office Union between 1716 and 1730, distillers headed the list, followed by tobacco merchants, bakers, and brewers, while some of the highest payments went to sugar-bakers. Sugar refining required boiling and drying the product, so it was a dangerous business.[64] Not surprisingly, some fire insurance companies refused to issue policies to high-risk industries and others imposed special conditions.[65] In May 1721, the Sun Insurance Office announced it would charge higher premiums for sixteen 'hazardous' trades that included, in addition to predictable ones like bakers, pastry-cooks, and roasting-cooks, mainly those that dealt in products whose use and importation had increased significantly since the mid-seventeenth century: apothecaries, brewers, 'chymists', colourmen, tallow chandlers, distillers, dyers, flax-warehousemen, hemp-warehousemen, oilmen, ships'-chandlers, soap-boilers, sugar-bakers. Two months later, they added pitch-and-tar-men, china-glass and earthenware, and malthouses.[66] This decision was based on bitter experience.

Of course, many of the large fires of the eighteenth century began in exactly the same way as the innumerable smaller ones that had occurred throughout London's history as a result of overturned candles, overheated bakers' ovens, or cloth hung to dry too close to an open fire. In the new environment, however, these banal fires could only too easily be accelerated by flammable

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[61] Jones, Porter, and Turner, *Gazetteer*, table 12; Margaret Makepeace, *The East India Company's London workers: management of the warehouse labourers, 1800–1858* (Woodbridge, 2010), p. 19.

[62] Entick, *New and accurate history*, II, p. 375; Lewis, ed., *Walpole's correspondence*, XXV, p. 577, Walpole to Mann, 7 May 1785.

[63] Entick, *New and accurate history*, II, p. 516, III, pp. 30, 127, 161, 221.

[64] *Fire Office Union, kept in Gutter-Lane by Cheapside, for insuring goods and merchandizes by mutual contribution, on the same easy terms with the Hand-in-Hand office for houses* (London, Apr. 1735), Guildhall Library, Broadside 11.91; Clive Trebilcock, *Phoenix Assurance and the development of British insurance*, I: *1782–1870* (Cambridge, 1985), pp. 334–42.

[65] LMA MJ/SP/0/001; *Fire Office Union*, Guildhall Library, Broadside 11.91; see also Broadside 32.66, *Abstract of the deed of settlement of the amicable contributionship, or, Hand-in-Hand Fire Office*, 'May 30, 1772'; Liliane Hilaire-Pérez and Marie Thébaud-Sorger, 'Risque d'incendie en milieu urbain et "industrious revolution": le cas de Londres dans le dernier tiers du XVIIIe siècle', *Le Mouvement Social*, 249 (2014), pp. 21–39, at pp. 26, 27.

[66] Dickson, *Sun Insurance*, p. 83 n. 1.

stores in the vicinity. In May 1755, a boy entered a stable with a naked candle, and by the time the fire was extinguished it had destroyed the adjacent brewhouse, a wharf, and twelve warehouses. Stocks of sugar, among other products, fuelled the big fire in Thames Street in 1715, in which (depending on which report one believes) between 50 and 120 houses and warehouses were destroyed. Another blaze at Wapping was caused by the lantern of a passing link-boy, which set fire to some stables that in turn ignited a brewhouse and its storehouses, then a hemp warehouse, and finally at least twenty-five neighbouring warehouses and granaries filled with linen, grain, brandy, and other products.[67] Some of the hazardous industries were scattered across the entire urban area, but the neighbourhoods along and behind the ports were particularly at risk because refining and processing was generally concentrated close to where the raw materials arrived. Sugar refineries, for example, were concentrated in the area south of St Paul's and in the East End, not far from the docks.[68] According to the *Gazetteer of English urban fire disasters*, Wapping experienced thirteen significant fires in the eighteenth century, more than any other place in England, and there were to be three more in the nineteenth. Shadwell too had eight such fires in the eighteenth century, while the largest London fire of that century took place in Ratcliff. Limehouse experienced its first bad fire in 1698, then five more in 1716, 1747, 1775, 1811, and 1814. On the other side of the river, Rotherhithe had eight sizeable fires in the eighteenth century, Bermondsey two.[69]

In all these areas, houses of uneven quality – although even there, more and more built of brick – were interspersed with warehouses and factories.[70] In 1719, a petition from the inhabitants of Wapping, Stepney, and Aldgate expressed concern that their parishes contained at least twenty storehouses for gunpowder and that some of these were adjacent to warehouses used for melting tar. A fire at Shadwell in 1746 that destroyed ten houses and damaged many others also consumed a wharf and warehouses containing 'great quantities' of brandy, rum, sugar, pepper, linen, and other goods.[71] The Hand-in-Hand insurance office figures for all fires, analysed by Robin

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[67] *The British chronologist, comprehending every material occurrence, ecclesiastical, civil, or military, relative to England and Wales, from the invasion of the Romans to the present time* (3 vols., London, 1775), III, 1 May 1755; LMA CLA/047/LJ/13/1715/005; *The case of the merchants-sufferers in the late dreadful fire, by the burning of sugar, ginger, oil, and sarsaparilla* ([London],1715); Entick, *New and accurate history*, II, p. 878, 15 Mar. 1720.

[68] Trebilcock, *Phoenix Assurance*, I, pp. 57–9, 335. On the distribution of many industries that posed a significant fire risk, see David Barnett, *London, hub of the Industrial Revolution: a revisionary history, 1775–1825* (London, 1998).

[69] Jones, Porter, and Turner, *Gazetteer*, pp. 16–26, 44; *British chronologist*, II, 4 Dec. 1716.

[70] M. J. Power, 'East London housing in the seventeenth century', in Peter Clark and Paul Slack, eds., *Crisis and order in English towns, 1500–1700* (London, 1972), pp. 237–62, at pp. 237–46.

[71] LMA inventory 60.225, 'Middlesex County Records, Calendar of Session Rolls', followed by 'Middlesex Sessions Books', nos. 769 (Jan. 1718/19), 1039 (Jan. 1746/7).

Pearson, show clearly the greater damage done by fires in the south and east of London, a result not only of more timber buildings and less adequate fire-fighting in those areas, as Pearson notes, but also of the stocks of hazardous materials there.[72]

We do not always know whether particular big fires began in the houses and spread because of poor building and inadequate firewalls, or whether they started in the industrial buildings and spread to the houses. In a sense, it does not matter. The fact is that the huge expansion of maritime trade with Asia, the Mediterranean, and in particular across the Atlantic had greatly increased the fire risk. London had become a world trading city, importing new products for its own use and for that of the kingdom as a whole, but also for processing and re-export. This was part of the transformations of both the 'consumer revolution' and the 'industrious revolution' that it drove, in which long-established industries grew in scale and intensity while major new industries appeared, based on new products such as sugar and tobacco. Of course, while I have emphasized economic changes, as noted above, these in turn arose partly from shifts in social practices that created greater demand for such products and that in some cases, such as tobacco smoking and the multiplication of furnishings, themselves increased the risk of fire.

V

The period from the mid-seventeenth century to the first half of the nineteenth thus represented a new era in London's fire history. After several centuries when the city had experienced only small fires, usually involving the loss of only one house, or a handful at most, quite suddenly it suffered a series of far larger conflagrations. If 1666 was by far the greatest catastrophe, the factors that produced this new era of large fires were broadly the same. Poor-quality housing, taller buildings, overcrowding, and a frequent disregard for fire regulations, all aggravated by population growth, were key elements. Anomalies related to climate change contributed to some large fires, and so did poor access to water that prevented small fires from being controlled before they spread. But an important new variable was the growing quantities of highly flammable materials stocked on the ports and in the warehouses and houses of the metropolis. This catastrophic era in London's fire history thus resulted from a frequently fatal combination of factors. Small fires became large ones when they set fire to adjoining wooden houses and warehouses, while the explosions and intense heat generated by highly flammable substances spread them still further.

The decades that followed 1666 witnessed an acceleration of the changes I have described, as London grew. Hazardous products were imported and stored in ever larger quantities, timber continued to be widely used in

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[72] Pearson, *Insuring*, pp. 79–80.

construction, and housing was still closely interspersed with industrial establish-
ments and warehouses, particularly in the southern and eastern suburbs and in
some parts of the old City. One of the key consequences was that older strategies
of fire prevention and fire-fighting were no longer adequate. Modern accounts
of the Great Fire are often condescending about the ignorant complacency of
Londoners. Yet early modern methods had apparently been quite effective in
controlling fires until the 1630s. They ceased to be so as the metropolis
expanded, as population densities increased, and as new industries developed
and larger quantities of flammable materials were stored in proximity to
housing. Certainly, the new building codes and other efforts at fire prevention,
together with improvements in fire-fighting, probably explain the decline in the
gravity of fires across the eighteenth century (with some notable exceptions).
Yet many dangerous factories and warehouses were not subject to the ordinary
building regulations until 1774, and even in the late eighteenth and early nine-
teenth centuries new constructions containing ever-larger quantities of
imported goods often had no party walls or fire doors. On the contrary, they
had open stair-wells and hoist shafts that facilitated the spread of fires.[73] It
was only in the middle of the nineteenth century, when there was tighter regu-
lation of such buildings, greater separation of housing and industrial facilities,
and further major advances in fire-fighting, that the problem was largely
controlled.

   The Great Fire, then, certainly did indeed mark a turning point in London's
fire history. But rather than being the end of a phase in which 'London was
always burning', it represented (along with the increasingly serious fires that
had been taking place since 1630) the beginning of a period of intensified
fire risk and repeated disasters. If Londoners were complacent before 1666,
they soon realized that they could no longer remain so, as further serious confl-
agrations showed the increased fire danger to be permanent, not a once-off co-
incidence. The new reality persuaded Londoners and governments that they
needed to respond to the threat of fire more vigorously, with new methods
and new forms of investment. Yet it took some time to work out which ones
were most effective. In the face of risks that continued to grow as the metropolis
did, and as its economy was transformed further, nearly 200 years were required
to (largely) master the fire danger. The key point here is that the problem of
urban fire had changed: it was not simply a matter of modern people finding
new and better solutions to an age-old problem. The risk was present through-
out London's history, but it was not static. Fire was a natural event, but in the
human-made environment of the city its nature and its consequences were
largely determined by changing human activity.

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[73] Ibid., pp. 59–60; Blackstone, *British fire service*, p. 90; James Braidwood, *Fire prevention and
fire extinction* (London, 1866), p. 40.