

11. DISCUSSION

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The burial assemblage recovered from St Mary's (Leith) matches a catastrophic palaeodemographic cemetery profile consistent with individuals succumbing to a disease epidemic, famine or war. In a typical catastrophic cemetery profile, there are higher proportions of Children (3–12 years) and Young Adults (20–35 years), as opposed to an attritional cemetery population, in which all ages and sexes are represented without bias (Wake, Morita & Wake 1978: 1045–52; Gowland & Chamberlain 2005: 152). This is certainly the case at St Mary's (Leith) which shares its deceased population profile with a 17th-century plague cemetery in Venice, Italy. Another later example of a catastrophic post-medieval cemetery population is McDonagh Station, Kilkenny, in which the effects of famine and disease, as in Leith, were clearly evident. Approximately 900 individuals were interred in burial pits at the site during the height of the great famine in Ireland in the 1840s; there were equal numbers of men and women but between 60% and 70% of the inhumations were Children (Cherryson et al 2012: 113).

This is a very high figure in comparison with the individuals from Leith, in which *c* 32% of the individuals were Non-adults. It would be expected that the number of Non-adult individuals in a cemetery population of this nature would be higher; simply the quantity of the burials within the small site area may be an explanation for this. On the other hand, a disease such as bubonic plague did not target a specific demographic group and it was a case of burying the deceased as and when they died regardless of age.

It should be noted that further victims of the 1645 plague epidemic were uncovered in Leith during drainage operations at Wellington Place, *c* 0.6km to the west of the site at St Mary's (Leith). Originally thought to have been the victims of siege of Leith in 1559–60, the sheer quantity of human remains as well as the presence of Female Adults and Non-adults led authorities to conclude that they were instead victims of the 1645 plague outbreak (Robertson 1861–2: 392).

11.1 Plague policy

In a bid to tackle plague epidemics, national and parochial-level plague policies were introduced which comprised two legislative statutes, namely the Rule of the Pestilence (1456) and the letter of James IV (1513) (Jillings 2018: 58). The former was issued at a national level, while the latter was not. The Rule of the Pestilence (1456) contained four clauses, the first of which stated that any person able to support themselves and their household was to confine themselves to their own house. The second rule involved civic obligation in the care of the community while the third and fourth clauses related to practices undertaken during epidemic outbreaks, including the prohibition of burning houses unless conducted without property damage (ie fumigating walls by burning heather) (Ritchie 1948: 694) and the pardoning of clergymen to process throughout their diocese (Jillings 2018: 59–60). The letter of James IV (1513) reiterated and enforced the legislature set out in the Rule of the Pestilence; civic and communal responsibilities of local governments and their citizens were highlighted and that citizens were culpable for the actions of their servants (*ibid*: 61).

The implementation of quarantine was a rational method of dealing with disease epidemics in England and Scotland throughout the 15th to 18th centuries. It was widely believed that the plague was transmitted as poisonous miasma and through corrupted, contagious pollution (Jones 2016: 110). The treatment of epidemic disease infection through strong odours and the avoidance of touch through quarantine still continued into the late 18th century (Jillings 2018: 63). Whilst strict maritime quarantine policies were brought into effect in urban burghs post-1550, the reinforcement of these policies was hindered by the plague epidemic itself; civic personnel either fled, were laid sick or killed by the disease. There are recorded instances of negligent maritime quarantine incidents and chaotic civil unrest at several Scottish burghs and ports, including St Andrews, Edinburgh (*ibid*: 126; CMB.7.184v 19 May 1585), Inverness, Fife and Aberdeen (*ibid*: 127).

When outbreaks of disease such as plague occurred in cities such as Edinburgh, York and London, strict preventative strategies including health restrictions,

curfews and trade constraints were implemented by magistrates (Mullett 1950: 436; Cherryson et al 2012: 112). These restrictions became more severe as epidemic disease outbreaks worsened. Bubonic plague outbreaks occurred in Leith in 1586 and 1587, with many houses in the district and Edinburgh badly affected by the plague (Shrewsbury 1975: 260). There was some doubt as to whether the disease was the pestilence, so eight commissioners were sent to Edinburgh to: ‘... visy the deid corppsis for their mair certantie’ (Scottish Burgh Records Society 1882: 504; Shrewsbury 1975: 260).

Their visit unfortunately confirmed that the outbreak was bubonic plague. In 1605, plague outbreaks occurred in numerous burghs and towns, including St Andrews, Edinburgh, Leith, Peebles and Roxburgh (Shrewsbury 1975: 288). Several councils brought in restrictive measures; the town council of Peebles brought in a quarantine legislation that decreed that any case of sickness must be reported to the bailies and Glasgow council authorities would impose a fine of £20 on any resident who received any visitor from plague-infected areas, including Lanark, Peebles, Leith, Linlithgow and Edinburgh (Comrie 1932: 219–20).

When the plague outbreak invaded Edinburgh in 1645, a high number of preventative action policies were implemented; Parliament was moved to Stirling and any individual who had contracted plague was to be executed if they attempted to escape (Mullett 1950: 450; Dingwall 1995: 23). Clean bills of health were issued to ships bound for the Spanish port of Cadiz, and quarantine measures were put in place on all ships to ensure that Edinburgh remained plague-free (Jillings 2018: 166; Edinburgh CMB.16.2r (28 Aug 1644); 16.5v (13 Sept 1644)). A similar scenario preventing the migration of infected people into and out of the city is recorded in the *Extracts from the Records of the Burgh of Edinburgh 1403–1528*; one entry, dated 28 March 1498, states:

... and the parochin of Hailles are infectit with this contagious infirmity of pestilence, quhairfore we charge straitly and commandis ... that na manner of personis dwelland within the saidis boundis addrees thame to cum to this toun and enter within the samyn under the payne of deid ... (Anon 1869: 72)

Despite this, as with previous epidemics in 1475 and 1504, all individuals who could flee did so as quickly as they could (Carmichael 1997: 62; ES online 2018: XXV). These included physicians, clerics and magistrates, among others (Jillings 2015: 129). Documents of pre-1645 date record execution by hanging for those who were accused of spreading plague in Edinburgh; gibbets were erected in 1585 and the council employed an executioner to carry out hangings. In contrast, gibbets were erected in Aberdeen in 1585 and 1608 but there is no evidence that they were in use (Jillings 2018; Edinburgh CMB.7.183r, CMB.7.186v 10 & 26 May 1585). Two women were sentenced to death by drowning in Edinburgh in October 1530 for potentially spreading plague (Marwick 1871: 42–3; Oram 2006: 20). As the 1645 plague epidemic in Leith worsened, the strict measures heightened and rapid burial of the diseased corpses was necessary in order to try and contain the epidemic; with large swathes of people having abandoned the district earlier on, this left fewer people available to deal with the increasing dead. Punishment for disobeying the health measures was severe and included the burning of property and goods as well as banishment for life; women were branded on the cheek and men had their hands severed (Worling 2010: 3). People, particularly children, were sent to the stocks and whipped; unlucky individuals were hanged for flouting the regulations, of which crimes included escaping enclosure, avoidance of the cleansing process, bringing goods into the city from infected areas and attending rural markets, among others (Jillings 2018: 132; Aberdeen City and Aberdeenshire Archives CA1/1 (ACR.40.811–816 28 Sept 1602; ACR.42.849 19 July 1606; ACR.42.315 14 Aug 1605)).

The consequences of the restrictions and the disease epidemic would also have included food shortages (Bruce 1840: 67) and the likely breakdown of the limited public health and sanitation services that operated in a 17th-century town (ibid). Urbanisation in Scotland rapidly increased during the 16th and 17th centuries, and the number of town-dwellers directly involved in the growth of their dietary staples fell abruptly. Previously valued horticultural, agricultural and domestic organic waste rapidly became a nuisance to citizens and needed to be disposed of quickly (Oram 2011: 2).

The middens and animal dung-heaps were still of value to the burgesses; many burgh councils enforced uncompensated seizure and disposal of the material as well as heavy fines, which in turn forced better management and clearance of the rubbish dumps and dung-heaps (*ibid*: 12). Many burgh councils met these measures with some resistance during the 16th and 17th centuries; in Leith in 1645, the severely depleted population as a consequence of the plague epidemic would almost certainly have caused waste management and disposal problems, yet another challenge to overcome in the face of a catastrophic disease epidemic.

One document, written by John Hayward in the 17th century, records the desperation of the inhabitants of Leith; the famine reduced many citizens to eating horses, cats, dogs and vermin (Bruce 1840: 67). Outbreaks of different diseases such as cholera, typhus and tuberculosis would also have occurred.

Leith witnessed several periods of famine during the 17th century, including during the 1645 plague. Many in the cemetery population may have had childhoods impacted by malnutrition. The 1620s were a particularly bad period for famine in Scotland, with four recorded episodes between 1620 and 1625 (Mitchinson 2002: 291–3). The physiological stress of malnutrition manifests itself on the skeleton via a number of pathological conditions, including linear enamel hypoplastic lines. In the Leith Links cemetery population, an unusually high number of individuals exhibited linear enamel hypoplasia, indicating at least one, if not several, episodes of malnutritional stress.

The epidemic that swept through Leith in 1645 is referred to by contemporaries as plague or pest but there is no modern medical confirmation that the disease was indeed bubonic plague, with its especially lethal pneumonic and septicaemic variants. The skeletal evidence clearly shows that the epidemic was not a disease that leaves an osteological trace, like tuberculosis, and this is certainly the case with bubonic plague, but such is true of many other epidemic diseases too, like typhus (Cox 1993: 71–9). It was commonly thought that plague was an urban phenomenon during the 16th and 17th centuries (Whyte 1995: 112, 122) and although this view was challenged (Fitch 1987: 33–5), the perception of plague as an urban phenomenon

remained through articles previously published by Mullett (Mullett 1950). However, the impact or incidence of disease epidemics was not considered and relied largely upon parish records from burghs and urban centres (Oram 2006: 7). The spread of plague as an urban disease was dismissed at first, although it was stated that epidemics occurring in the pre-1590s were primarily urban (Smout 1977: 151–3; Flinn 1977; Smout 1978: 19–33).

Smout, writing in the late 1960s, claimed that typhus was a likely alternative to disease epidemics in the winter periods of the early 17th century (Smout 1969: 164). Records of the spread of bubonic plague in rural populations are rarer, although this did not signify a decline in the spread of disease within the rural community; legal and socio-economic documentation and archives were more abundant in urban centres (Smout 1978: 19–33; Oram 2006: 8). It is clear that outbreaks of typhus and plague were common to both rural and urban populations during the 14th to 17th centuries (Oram 2006: 8).

While the archaeological evidence does not confirm the nature of the 1645 epidemic disease, it should be noted that contemporaries were not unfamiliar with cases of bubonic plague and some at least should have been able to identify it. Typhus was usually called the fever, whereas bubonic plague was the plague or the pest. Moreover, 19th-century medical observations, at a time when neither public health practices nor medical interventions were greatly advanced on those of the early 17th century, noted death rates from typhus in Leith that were far lower than those recorded for South Leith in 1645 (Stark 1848: 261).

If, as seems most likely, the epidemic of 1645 was indeed bubonic plague, then the incidences of apparent sudden death outside of the sick bed may be an indicator that the extremely lethal septicaemic variant of the disease was prevalent. This plague variant can cause rapid deterioration and sudden death. The death rate in Leith, recorded as being up to half of the population, is indicative of the pneumonic variant also being present. The pneumonic variant transforms the plague from a largely non-contagious disease transmitted by a flea bite, into a contagious disease readily passed from person to person in a similar fashion to influenza. Pneumonic plague can also cause rapid deterioration and sudden death.

The Leith burials reveal evidence of how the diseased bodies were regarded by those charged with their committal. As stated in the ScARF modern panel report: ‘The treatment of the body after death, and its commemoration, are important sources of evidence for understanding how the modern self was constructed’ (ScARF 2012).

There are a number of different interment methods visible in the Leith cemetery population, including coffined burials, uncoffined burials and shrouded burials in pits. Fear of the diseased corpses would have influenced how the living treated the dead; although the deceased individuals would have been relatives, friends and co-workers, the erroneous fear associated with infection would have overruled any personal relationships. Plague could not be spread from the corpse to the living, but contemporaries were unaware of this. It could, however, be transmitted via fleas in the clothing of the deceased. Fear of the diseased corpse is visible in this excavated cemetery population from Leith. A number of individuals were buried with goods about their person in the form of everyday items such as money, combs, keys and sewing kits, indicating that the bodies were not rifled prior to burial. The quick construction of the coffins and the position of the bodies in the pits would indicate an urgency on the part of the living to dispose of the dead as quickly as possible. This in turn indicates a heightened fear of the diseased corpse on the part of the living. A 19th-century account of the disease outbreak based on the records of South Leith states: ‘Many of the dead were buried in the Links, and even now it is not unusual, when the ground is opened, to find bones, and even, it is said, fragments of the blankets or other material in which the bodies were hastily wrapped and buried’ (Groome 1882: 492).

Whilst some bodies do appear to have been disposed of in this way, especially in the earliest phase of burial on the site, later burials were in coffins. The number of coffined and shrouded burials of Non-adult individuals equates to an almost equal split; it is interesting to note that most of the younger children (<10 years of age) were interred in coffins. This may reflect differing attitudes towards young children in that society: that the bodies of young children had to be treated more reverently, despite the dread of the plague.

The archaeological evidence presented at this site may contradict some historical accounts. Evidence of reverence and respectful burial practices is presented in this cemetery population, while some historical accounts paint a darker picture. A poem penned by Hercules Rollock, *De Peste Edinburgi*, records the mistreatment of bodies for fear of the diseased corpse: ‘The body is committed to the urn ... by a hook, through the shortest route and in the dark of night, a corpse-bearer drags it, boldly he thrusts it into a gaping ditch stinking with foul sulphurous vapours’ (Jillings 2014: 3).

Whilst there is evidence of hasty burial practices with this cemetery population, most of the burials are coffined. Fear of the contagion would have been rife, although there is evidence of the need for respect for the deceased.

The orientation of the burials appears to fall into two groups, including east–west and north–south alignments. The vast majority of the burials are east–west aligned, as would be expected in a Christian burial cemetery, but there are a minimum of 11 north–south-aligned burials. Why these individuals were buried on a north–south alignment remains unclear, although different religious and/or societal affiliations may be an explanation. Another explanation may have been lack of burial space; it may have been a case of burying them in whatever space was available as normal burial conventions were abandoned. This scenario is also documented in Defoe’s *Journal of the Plague Year* (1722) which, although a work of fiction, is based on parish accounts recorded during the plague outbreak of 1665 in London: ‘... they died in heaps, and were buried by heaps ...’ (Defoe 1722: 337).

Unsurprisingly, all of the individuals buried with wooden rosary or paternoster beads are aligned east–west. Strontium analysis conducted on 27 of the bodies has revealed a population largely local to Leith, which presents interesting implications when examined in conjunction with the artefacts, particularly the wooden rosary or paternoster beads. That five individuals in this cemetery population had these beads about their person upon interment indicates their affiliation with the Catholic faith; to be overtly practising Catholicism in a heavily anti-Catholic and pro-Covenanter society would have been dangerous, and the individuals would have been forfeit to a range of penalties if caught. That

these individuals exist in this cemetery population shows that not all inhabitants were supporters of the Covenant petition and that they were continuing to practise their faith, in all likelihood secretly, despite the risks of persecution upon discovery.

The wooden beads are of plain design and are likely to have originated from simple confessional religious apparel. Their basic design is reflective perhaps of the lower social status of some of the individuals, as many rosaries and paternosters would have been crafted from more expensive materials such as carved bone and semi-precious/precious stones. The beads could also have originated as a plain set (ie minus crucifix/tassel/end or gaud bead); given the anti-Catholic sentiment in Leith during

the 1640s, it is feasible to argue that, if the item was discovered on the individual, it would be far easier to explain away a simple beaded necklace than to admit to the object as a personal confessional necklace.

It is more than likely that the individuals interred in the burial pits were members of the same family; analysis of the biological profiles of individuals from the pits shows a number of Older Adults, Children and Adolescents, which may represent parents and their children, siblings and extended family members, particularly in Pits C415 and C491 (Table 9).

Throughout the 16th and 17th centuries, one way of both containing a disease epidemic and

Table 9 Biological profiles of individuals interred in plague burial pits

Pit	Sk no.	Biological profile
415	439	Adolescent/Adult 16–20 yrs
	440	Adult
	441	Adolescent 15–17 yrs
	442	Male Adult 44–47 yrs
	443	Male Adult 45+ yrs
	477	Female Adult 40–50 yrs
	478	Female Adult 40–50 yrs
	479	Adolescent 14–16 yrs
	480	Male Adult 24–30 yrs
	481	Child 11–12 yrs
	482	Female Adult 30–40 yrs
	483	Female Adult 24–25 yrs
	484	Female Adult 20–24 yrs
	491	430
493		Female Adult 30–35 yrs
494		Female Adult 35–45 yrs
495		Adolescent 16–20 yrs
516	518 & 531	Male Adult 18–22 yrs
	519 & 532	Male Adult 17–22 yrs
	520 & 530	Child 6–7 yrs
	527 & 535	Child 5–7 yrs
	528 & 534	Child/Adolescent 12–15 yrs
558	511	Female Adult
	512	Male Adult

treating the infected citizens was to create temporary shanty-town settlements on the outskirts of burghs and urban centres (Oram 2006: 18). The earliest recorded instance of this type of settlement is in Aberdeen in 1514 (Smout 1978: 25–6). A document describes an early 17th-century temporary sick camp in Ayr as ‘the foull mur’ (Pryde 1937: 98, 100, 232). David Aldinstone, in the Register of South Leith Church 1643–60, records that at the height of the 1645 plague outbreak, these temporary camps of wooden huts or ‘ludges’ were built along the Leith Links (or the burgh muirs in Edinburgh); infected people, including members of entire households, were brought to these huts for treatment in isolation, although ultimately the inevitable outcome was death (Dingwall 2010: 112; Aldinstone (*Register of S. Leith Church 1643–60*)). There is a very strong

possibility that this cemetery population was associated with the Leith Links camp.

It is highly likely that, although members of the same family were interred in these pits, the interred individuals were mixed randomly. As stated previously, given the lack of burial space as a consequence of the epidemic, whoever died (be they related or non-related) had to be buried as soon as possible. This is reflected in documents detailing health regulations put in place during the 1665 plague outbreak in London; the Central Board of Health required individuals to be interred within 24 hours of death, wrapped in either cotton or linen cloth (Cherryson et al 2012: 112). Similar measures were enforced in Leith; a 19th-century account records bodies swathed in coarse blankets with blue stripes (Campbell 1827: 147).