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**Mass Burials from   
St Mary Spital, London**

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**Introduction**

This talk focuses on the results of archaeological and osteological analyses of human skeletal remains from an excavation that took place on the site of a large Augustinian priory and hospital in East London. The priory was known as St Mary Spital, although it was originally called St Mary without Bishopsgate.[[1]](#footnote-1)

The first mention of the priory, which was founded by Walter and Roisia Brunus, comes from 1197.[[2]](#footnote-2) It was one of an increasing number of charitable institutions built in response to growing urban populations in England during the 12th century. Chief amongst the functions of the priory were to care for the *s*ick, the poor, the homeless, the elderly and pilgrims. In medieval England it was thought that outward signs of disease reflected spiritual neglect. In other words, those who fell ill were thought to have committed a sin. We would certainly not have recognised anyone we would identify as a medical doctor at St Mary Spital. Unlike modern hospitals, ‘treatment’ prioritised caring for the soul.

The priory was situated on Bishopsgate, a major road running north-south through the city. It lay to the south of Holywell Priory and to the north of St Mary Bethlehem, later better known as Bedlam, an area we are excavating at the moment. St Mary Spital lay outside the city walls in a prime location to attract pilgrims and other travellers entering or leaving London. Those staying at the priory would thus be close to the city but at the same time avoid the densely occupied areas within.

Wyngaerde’s panorama of London provides a view of the city from the south bank of the Thames looking north. It dates to about 1538 and shows The Tower in the foreground and St Mary Spital in the distance, with Bishopsgate leading out from the city walls. The panorama gives us some idea of the density of occupation within the walls and the relatively open spaces beyond. As you can see the priory church was substantial and at its height was one of the largest hospitals in England.

Now, the reason I am talking about St Mary Spital is that it was founded just to the north of a pre-existing burial ground that was used as an overflow and emergency cemetery by the City of London, and although this cemetery was incorporated into the priory precinct, it continued to be used by the city, and later by the priory as well, up to the Dissolution.

**The excavations**

The main excavations on the site of the priory burial ground were carried out by Museum of London Archaeology (or MOLA) and took place between 1999 and 2002, during which time approximately 10,500 human skeletons were recovered. This came as a bit of a shock to Chris Thomas, the archaeologist in charge, as the original estimate was around 4,000. However, this was a very large and well-funded project which included a great deal of redevelopment as the City of London pushes ever eastwards towards Brick Lane, and fortunately we were able to recover all the individuals. Calculations based on burial density and the area of land occupied by the cemetery suggests that the original burial population was about 18,000. Many of the lost skeletons were probably disturbed during the building of the western half of the Victorian market.

As I work for Museum of London Archaeology, I should at this point acknowledge the work of the large number of past and present colleagues who worked on this project, including a large number of archaeologists, human bone processors and osteologists, in particular, Brian Connell, Bill White, Amy Gray Jones and Rebecca Redfern.

Previous excavations to the north-west of the cemetery outlined the plan of the priory church as well as associated buildings within the complex. The north and south ranges of the church were probably utilised as hospital dormitories containing about 60 beds, with one range for men and one for women, divided by curtains. As the hospital grew, a two-story extension was added to the west side of the north range, probably built *c* 1320–50. This increased the number of beds to perhaps 120. The capacity of the hospital would probably have been higher than this as it was common for such institutions to fit two or three patients to each bed. John Stow claimed it had 180 beds, making it the largest hospital in London.[[3]](#footnote-3)

The burial ground itself was furnished with a cemetery chapel in the early 14th century. When excavated, its upper floor had gone but the lower floor which had been used as a charnel house survived. Following excavation, the chapel was preserved in situ so you can still see it behind glass below pavement level in the piazza to the west of the existing market. There was also a pulpit cross to the north of the chapel, where people gathered to hear sermons on religious days.

The burials were divided into four periods of use based on stratigraphic evidence combined with the use of targeted radiocarbon dating. As well as being one of the largest burial ground excavations it is hopefully one of the best dated. It was used for burial for four hundred years and it eventually went out of use at the Dissolution. The burials were then further divided into burial types. ‘Attritional’ burials included all those that were believed to be the result of normal rates of mortality, consisting chiefly of organised, spaced rows of individual burial plots, together with some single horizontal layers often of two or three bodies and some vertically stacked or ‘shaft’ burials, all interred at the same time (usually three or four bodies deep). It has been suggested that the stacked graves were dug in response to small-scale epidemics at the priory. Some of the attritional burials were contained within stone-lined tombs. These clustered on the western side of the cemetery, near the church, and probably contained higher status individuals (though not sufficiently important to qualify for burial within the church itself). Other single inhumations were found with papal bullae, and others, presumably priests, with chalices and patens.

The other main burial type consisted of 497 multi-layered mass burials within large pits, typically containing between eight and 45 bodies. These were interpreted as reflecting high mortality rates during catastrophic episodes. The mass pits were simple earth-cut constructions. They tended to be about 1.9m long (east–west), 1.2–1.6m wide and around 1.5m deep, so dug to approximately the gravedigger’s shoulder level.

As with most of the other burials in the cemetery, individuals in the mass pits were probably dressed in shrouds, with minimal use of coffins. The mass burials appeared well ordered with consistent alignment of bodies and no evidence that individuals were thrown in from the sides of the pit. The majority of bodies were aligned with heads to the west and feet facing east. However, in some cases, children were placed at the foot end of the grave, laid out north-south, apparently to make optimum use of the space within.

**The analysis**

The evidence from the mass burial pits shows that the dead were probably victims of episodes of high mortality. Rapid burial was a priority but bodies were still treated with respect and given Christian rites. The orderly nature of the graves reflects a certain degree of care. Equally there is no doubt that there were pressures of both time and space. The cemetery filled up very quickly reducing the amount of land available for burial. We can see this when we look at two periods of burial in particular, periods 15 and 16. At the end of period 15 a large number of pits were dug in regularly spaced rows. Then, only a short time later, at the beginning of period 16, a new phase of pits was dug, and these were squeezed in between the period 15 pits. I think this reflects the fact that the burial ground was filling up fast and space was at a premium.

The gravediggers were trying to avoid the earlier burials, but were not always successful. Some of the period 15 pits were disturbed by the digging of the later period 16 pits. We see this in both the truncation of the earlier pits and the re-deposition of bone from these into the backfill of the new period 16 pits. Interestingly, the re-deposited bone often took the form of articulated limbs, showing that they were still fleshed when the disturbance took place. This re-enforced the impression that little time separated the mass burials of period 15 from those of period 16, as the bodies had not been in the ground long enough for the soft tissue to fully disappear. Again I don’t believe the disturbance of these burials signified a lack of respect for the dead. It simply reflected pressures of time and space.

The outer areas of the cemetery, to the south and east, were used for the digging of the majority of mass pits. These areas lay away from the priory church, but still within consecrated ground. This reflects a form of sacred geography where the pits were dug in the least sacred part of the cemetery. It also probably served practical purposes, in reducing the amount of disruption to the running of the priory and its burial ground.

Of the 497 mass burial pits, 448 were found in periods 15 and 16, with many falling close to the boundary between the two periods. So what caused such high levels of mortality? Here we can look at the archaeological evidence, including that from the bones themselves. One possible reason for burying large numbers of individuals in a single event is the disposal of the dead following battle. There are precedents at other medieval sites such as Towton[[4]](#footnote-4), where significant evidence of peri-mortem (around the time of death) weapon injury was found on the skeletons. Such evidence is extremely scarce at St Mary Spital, showing that the mass pits did not contain victims of battle. Additionally, if one assumes that the majority of combatants would be men then one would expect a high proportion of male burials within the pits, which is not the case.

We do not have to search far for catastrophic events in medieval England. Most famously, the Black Death killed as many as 30–50% of London’s population, perhaps 40,000 people, from 1348–50. However, the dating from St Mary Spital revealed that only a few small mass pits, containing six or seven bodies per pit (perhaps 200 people in total), were contemporary with the mid-14th century. However, we know that the majority of Black Death victims were sent to new cemeteries at West Smithfield and East Smithfield, opened specifically to deal with the ‘Great Pestilence’. Indeed, recent excavations of Black Death victims at West Smithfield revealed that at least some of the dead were buried in single graves. Mass burial pits may have only have been employed when the plague was at its height.

Radiocarbon dating confirmed that the great majority of mass burial pits at St Mary Spital pre-dated the Black Death. Many more were dated to the second decade of the 14th century, the period of the Great Famine of 1315–17. On average the pits from this period contained about 20 corpses arranged in three or four layers of five bodies. It is estimated that originally there may have been as many as 1400 victims of the Great Famine buried at St Mary Spital.

So how do we go about looking at the effects of famine on populations in the past? As often in archaeology we attempt to employ a holistic approach, working with and combining different strands of evidence to fill in the gaps in our knowledge. We can read contemporary documentary sources and accounts of other historical famines, such as the Great Irish Famine in the mid-19th century. We can study evidence of variations in funerary practice, such as the opening of emergency burial grounds to cope with increased mortality rates. Osteologists can compare attritional burial samples with those of suspected famine sufferers, to investigate whether males or females were most affected, and at what ages. Are there signs of disease or malnutrition prevalent in the famine sample that might show it was the weakest who succumbed first? Bioarchaeology, which embraces recent advances in techniques such as ancient DNA and stable isotope analysis, is an exciting field opening up many different areas of study of these past populations: what did they eat, where did they come from and what diseases were they exposed to? We also look at the effects of modern famine for which, unfortunately, there is ample data. As these events tend to occur in poor agricultural groups there is some validity in looking at the effects of famine on fertility and mortality and investigating whether archaeological evidence reflects similar patterns.

At this point we should look at the reasons why populations suffering food shortages become ill. A reduction in the intake of food can lead to malnutrition, or more correctly, undernutrition, where there are insufficient nutrients to maintain normal bodily function. This can cause a number of somewhat predictable outcomes, such as tiredness, reduced physical energy, mental confusion, impaired immunity leading to increased disease and mortality particularly in vulnerable groups such as the very young. Reduced physical energy and mental capacity can compound any existing problems by reducing effort expended on maintaining adequate hygiene and childcare.

Reduced access to food leads people to resort to poor quality diets, and unfamiliar or improperly prepared fare. Medieval sources report that people ate tree bark, shoe leather and horse. Consumption of spoiled and diseased foods increased, leading to gastrointestinal disease, including dysentery and diarrhoea, major killers in modern famines, particularly of the very young.

So what effect would all this have on a population? Work by Julia Beaumont on stable isotopes at Bradford University has shown that high nitrogen levels in infants’ teeth may reflect the effects of their mother’s starvation during pregnancy[[5]](#footnote-5). In effect, the mothers use their own body’s resources to grow and provide milk for their young. This obviously has consequences for the mother but in times of famine people tend not to die of starvation per se. Most are killed by microorganisms taking advantage of weakened human hosts. The depression of the immune system caused by low nutrition encourages opportunistic infections such as measles. Such infections can spread rapidly in weakened populations and have a catastrophic effect. It is often the case, with any form of population crisis that it is not the initial source that has the greatest effect but rather the diseases that take hold within groups with reduced access to resources.

However, it can be difficult to differentiate famine populations through traditional osteological methods. Many associated diseases are acute in nature, in that they act over short periods of time, too brief for the types of bone changes we look for to occur. It is also true that organisms that can decimate famine populations can also be found in non-famine groups. For example, malnutrition may aggravate pre-existing chronic conditions such as tuberculosis, which we can sometimes identify in bone. But how do we differentiate between famine and non-famine sufferers of the disease? It is hoped that new techniques being applied to the St Mary Spital skeletal assemblage by Jelena Bekvalac and Rebecca Redfern at the Centre for Human Bioarchaeology here at the Museum of London will help us to understand the differences between famine and non-famine groups.

So, to recap, St Mary Spital was found to have a large assemblage of emergency burials, possibly the result of famine in London in the second decade of the 13th century. However, when we received the full radiocarbon dating results we found that while we could attribute about 1400 of the estimated original catastrophic burials to this time, the majority, about 3,500 burials, were at least 50 years earlier, around the middle of the 13th century, effectively right at the end of period 15 and the beginning of period 16, the two largest phases of mass burial use. These pits tended to contain about ten corpses arranged in three layers of three or four bodies.

This was a bit of a puzzle, as it was not something we were expecting. It is true that famine and pestilence were no strangers to medieval London, but to have such a high concentration of burial at this time was a real surprise. So we started looking at documentary sources, some of which were kindly supplied by John Clark Museum of London Curator Emeritus. This bore fruit in that we found some interesting entries from the St Albans monk Matthew Paris in his *Chronica Maiora*. In 1258, he recorded that:-

“the north wind prevailed for several months, and when April, May, and great part of June were over, scarcely a small rare flower or shooting germ appeared, whence the hope of harvest was uncertain”. “Innumerable multitudes of poor people died, and their bodies were found lying all about swollen from want, and livid, five or six together …”[[6]](#footnote-6)

“And when many dead bodies were found, large and capacious pits were made in the cemeteries, in which the bodies of very many people were placed.”[[7]](#footnote-7)

“Nor did those who had homes dare to harbour the sick and dying, for fear of infection,…the pestilence was immense - insufferable; it attacked the poor particularly. In London alone 15,000 of the poor perished…”[[8]](#footnote-8)

Another contemporary source, the Chronicles of the Mayors and Sheriffs for 1257–8 stated:

“In this year, there was a failure of the crops; upon which failure, a famine ensued, to such a degree that the people from the villages resorted to the City for food; and there, upon the famine waxing still greater, many thousand persons perished; many thousands more too would have died of hunger, had not corn just then arrived from (fn. 17) Almaine.”[[9]](#footnote-9)

So had we found historical references to the catastrophe that led to the creation of the emergency burial ground at St Mary Spital, and if so, what could have caused the apparent extremes of weather that had such a devastating effect on crops?

We know that large volcanic eruptions can cause dramatic climatic variation, so I found a very useful website, that of the Global Volcanism Programme, hosted by the Smithsonian. Although the format of the website has changed over the years, it used to have a very neat page where you could type in a date and retrieve information for all eruptions from that year. For example, if you typed in AD 79 you would bring up the Roman Vesuvius eruption. So I typed in 1257 and 1258 and found…nothing.

However, the search only returned information for eruptions with known sources. If it was unclear which volcano had erupted it was not included in the results of any search. It only took a minute to discover that indeed there was geological evidence of an eruption from 1257 or 1258. This evidence was recorded in nine northern hemisphere ice cores and six Antarctic ice cores. It was also found in lake bed sediments from Lake Malawi. The stratospheric sulphate load of the eruption was eight times that of Krakatau (1883) and twice that of Tambora (1815) which we know caused a ‘year without a summer’ and failed harvests in Britain and Ireland. The VEI, or Volcanic Explosivity Index, rating of seven equates to what is known as a ‘super-colossal’ event. These occur about once every thousand years. In fact, this was the largest volcanic eruption of the last millennium and one of the most substantial of the Holocene (*c* 12,000 years).

Such an event would create what is known as a ‘dry fog’ of water vapour and gas in the stratosphere, reducing incoming levels of solar radiation and cooling the surface of the earth. The disruption of atmospheric circulation could cause increased precipitation thereby threatening crops.

It emerged that scientists had been searching for the source of the eruption for over 30 years. Previous suggested locations included El Chichón in Mexico and Quilotoa in Ecuador. Finally, just a year after we published St Mary Spital, the source of the eruption was identified as the Samalas volcano in Indonesia.[[10]](#footnote-10)

So, to conclude, when all the evidence is taken together, it seems that the emergency burial ground at St Mary Spital may have been a localised example of a much greater phenomenon. To a large extent it is only by luck that we could make this connection. St Mary Spital was a very large, well-funded project with the resources to carry out a comprehensive programme of radiocarbon dating. Otherwise, without accurate dating, we may simply have assumed these were Black Death or Great Famine victims. Perhaps with increased dating of medieval burial grounds we will find further evidence of catastrophic assemblages from this time.

This is the first archaeological evidence for the 1257 volcano and is a good example of the unusually broad scope of research with which we can become engaged. It is amazing to think that evidence of such a massive global natural disaster can exist in a small area of London. As for the people of the medieval city, they could never have imagined that their suffering was part of a truly global event originating on the other side of the world.

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1. Thomas et al 1997, 20 [↑](#footnote-ref-1)
2. Thomas 2004,43 [↑](#footnote-ref-2)
3. Ibid [↑](#footnote-ref-3)
4. Novak 2000 [↑](#footnote-ref-4)
5. Beaumont et al, 2013 [↑](#footnote-ref-5)
6. Farr 1846, 160 [↑](#footnote-ref-6)
7. Translation John Clark [↑](#footnote-ref-7)
8. Farr 1846, 160 [↑](#footnote-ref-8)
9. Farr 1846, 160 [↑](#footnote-ref-9)
10. Lavigne et al 2013 [↑](#footnote-ref-10)