

Fig. 1: site location, showing areas of excavation, extent of burial ground (light green) and area of excavation where burials were excavated (dark green)

Excavations at Royal Mint Square

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Introduction

Museum of London Archaeology (MOLA) was commissioned by the London Borough of Tower Hamlets to undertake an archaeological investigation into the landscaping of an open space at Royal Mint Square (National Grid Reference TQ 34000 80730; site code RMI05; Fig. 1). The archaeological work took place between October and December 2005.

The work involved the creation of two large ovals, with areas of hard landscaping in the west and the north-east corner. During the removal of the topsoil and underlying subsoil by machine, a number of human burials were uncovered, relating to the former Aldgate burial ground. A total of 238 burials were recorded, of which 210 were analysed, formed of 187 articulated burials (from 192 contexts) and 34 redeposited or mixed contexts.

The new churchyard

The burial ground belonged to the parish church of St. Botolph, Aldgate, whose existing churchyard was too small. The Vestry secured land in Rosemary Lane for the new burial ground. The New Churchyard was consecrated on Tuesday 18 April 1616.

There was initially considerable reluctance on the part of the

parishioners to use the new burial ground, old associations having made them prefer the churchyard, and in November 1616 it is recorded that 'at this time the ground in the old churchyard was raised dearer for Burialls, because the parish would have dead corpses buried at the new buriall place in Rosemarie Lane'.¹

The ground went out of use at the end of the 18th century. The burial ground was built on, first by a warehouse in 1819, and then tenement housing and a school were built in the mid-1800s. Mrs Basil Holmes, writing in the 1890s, notes that 'At the beginning of this century it was covered with small houses, the Weigh House School being built on it in 1846. The rookery was cleared by the Metropolitan Board of Works, and Darby Street was made, gravestones and remains then being discovered. The Metropolitan Public Gardens Association informed the Board of the former existence of a burial ground, with the result that what remained of the ground was not built upon, but was made into an asphalted playground, about 1/8 acre in extent, for the children of the adjoining block of tenements'.² Later large-scale development of the area in the early 1980s saw the park being used as a

builder's yard during the construction of the current housing estate. The site was then landscaped as a public park for local residents.

The excavation of a service trench at the western side of the park sited at the Cartwright Street entrance showed that the burial ground extended at least that far west, with the possibility of it extending beyond the confines of the current park's boundary wall.

The burial registers and other parish records are held in the Guildhall Library. The burial ground is referred to in the St Botolph parish clerk's memoranda book for 1617 (the first that survives after the burial ground was opened) as the New Churchyard. The first burial which took place in the burial ground in this book is that of Christopher Dent, a servant of East Smithfield, on 7 January 1617. However, location of burial is only recorded sporadically in the memoranda books from 1617–25,³ so it is not possible to determine what percentage of the buried population were using this ground. They do note that parish burials were taking place in the ground, that is those of the poor paid for by the parish, although they were not being buried there exclusively, as parish burials also took place in the Old Churchyard. The burial registers for

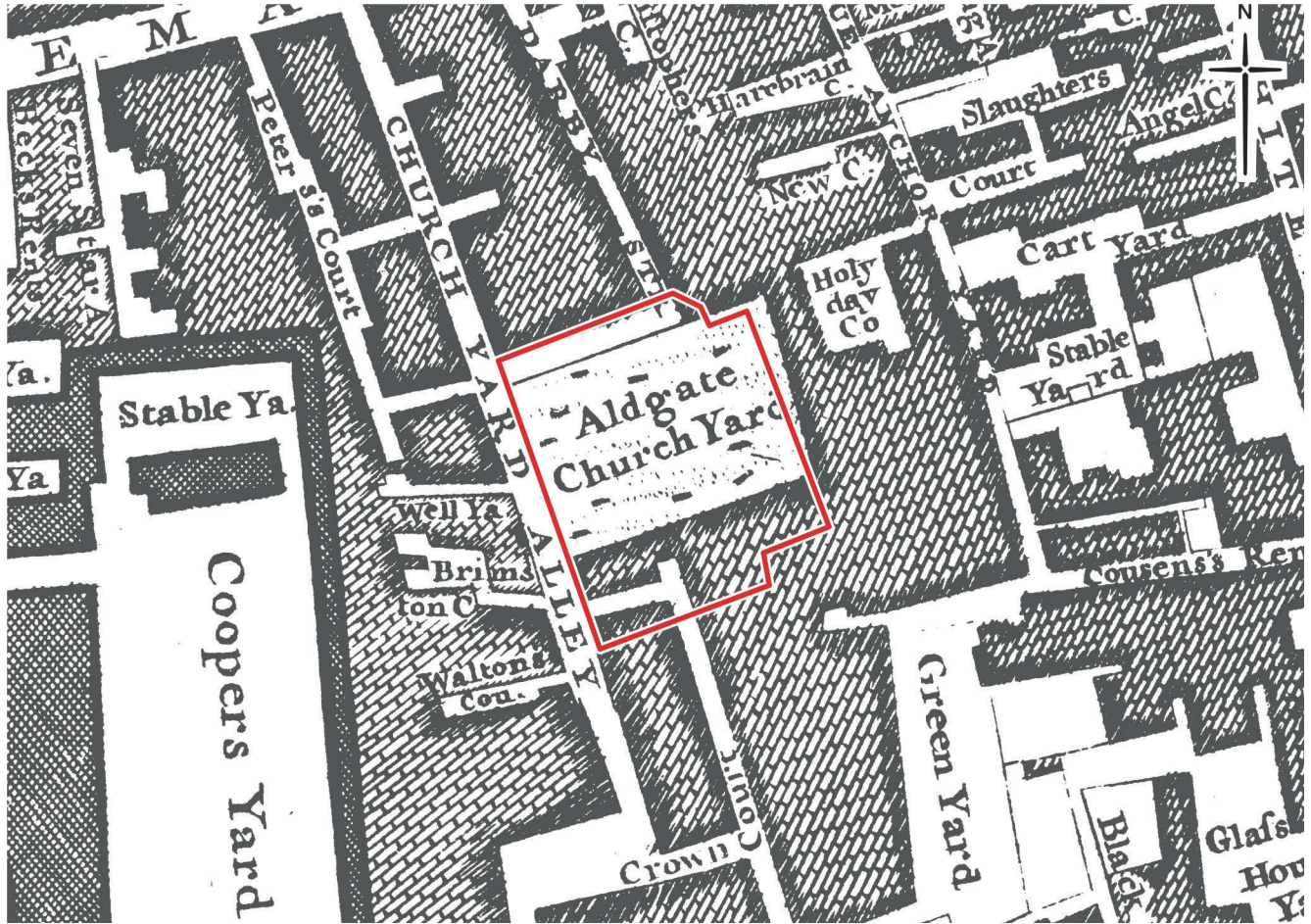


Fig. 2: John Rocque's map of 1747, showing the burial ground

1673–1812⁴ do not include place of burial. However, a rough burial register for 1745–9 survives,⁵ which does include place and cost of burial (see Table 1). January and February 1746 were examined, when 75 burials took place. Of these, 30 (40%) took place in the New Churchyard, 36 (48%) in the North (Old) Churchyard, 2 (3%) in the church vault and 7 (9%) where no location was given. The fees to be buried in the New Churchyard can be seen from the following examples:

- 9 January 1746 Sarah Comber, child of Gilbert, Coopers Court, East Smithfield, New churchyard, paid 5s 6d.
- 26 January 1746 Elizabeth Dangerfield, a woman from Workhouse, Gravel

- Lane, New churchyard, paid 8s.
- 14 January 1746 Elizabeth Squires, a woman, Rosemary Lane, 4 bearers, 3 pall New churchyard, paid 14s 6d.

The skeletal sample

A sub-sample of 88 individuals excavated from the site were fully osteologically analysed and recorded onto the Wellcome Osteological Research Database (WORD). The complete osteological analysis and data can be accessed by contacting the Museum of London.⁶

The environment in which people live has significant consequences for an individual's health and well-being, and the skeleton is a physical reflection of

the susceptibility of individuals to the vagaries of disease and social change.

They frequently provide direct evidence for the often dramatic effects in a changing social environment and are a rich repository for gaining information about the past. They provide an invaluable glimpse into the lives of our predecessors and the dangers of the times they lived in.

To enable an osteologist to observe many of these changes in the skeletal remains, the conditions suffered by the individuals regrettably need to be chronic or traumatic to alter the integrity of the bones from their normal condition. Fast-acting and acute diseases cannot be readily observed by an osteologist.

The 88 individuals analysed provided an insight to the population living in the environs of the parish of St Botolph without Aldgate and revealed that they had suffered an interesting array of diseases and accidents.

The assemblage comprised 76 adults (86%), and 12 sub-adults (14%), sub-adults being less than 18 years old

	New Churchyard	North (Old) Churchyard	Vault under church	Vault under steeple
Child	5s 6d	10s 4d		
Adult	8s	15s 6d	£2 5s 10d	£4 4s
Non-parishioner		£1 0s 6d		

Vault costs include all funeral extras, such as bells, prayers and bearers

Table 1: cost of burial, St Botolph Aldgate, 1746



Fig. 3: skull from individual with metastatic osteoblastic carcinoma [605]

at death. Of the 76 adults where it was possible to determine sex, there were 37 males and 33 females, with six individuals not having the criteria present to determine sex. The proportion of sub-adults was rather small compared to the similarly-dated London sites at Chelsea Old Church⁷ and St Marylebone,⁸ but most notably to the Cross Bones ground,⁹ where 98 of the 148 burials were sub-adults; there could be many factors involved, including burial practices, preservation and retrieval. In post-medieval cemeteries infants were not infrequently placed uppermost in stacked graves, and in any subsequent disturbance would potentially be the first to be removed and lost, thereby giving a false representation of the actual numbers in the buried population.

The sub-adults were aged when possible using diaphyseal (long bone) measurements, epiphyseal fusion and dental development data.¹⁰ Of the 12 sub-adults, five were under 1 year with three (25%) neonates aged in weeks, five (41.6%) died in the age category 1–5 years and two died in the 6–11 year age category. Only one poorly preserved neonate [375] showed any discernable traces of disease or trauma. This suggests that the sub-adults died from acute diseases or disorders that were too fast acting to affect the bones. Infant mortality was a common occurrence and the high rates continued throughout this time period,

with the younger individuals of society being highly susceptible to infectious diseases, gastroenteritis and diarrhoea.¹¹

Adults were aged and sexed following standard guidelines and placed in age categories with a 10-year range.¹² The age at death profile for this assemblage found that the peak of deaths for males was in the 36–45 year category (45.9%) and for the females more evenly spread between the 26–35 and 36–45 year age categories (both 30.3%). The youngest adults (18–25 years) were all females, which could possibly be related to childbirth and the dangers involved in child-bearing during this time.

Health and disease

The pathological profile of the individuals from this assemblage provided some interesting results, not only in comparison to other post-medieval assemblages but also from their own unique perspective. Three individuals were of particular interest.

Prostate cancer

A male [605] exhibited skeletal lesions in his skull, right pelvis and vertebrae (spine) that had the characteristic bone changes and distribution of metastatic osteoblastic carcinoma (Fig. 3). Furthermore, from the type of lesions (producing rather than



destroying bone), affected areas of the skeleton, and the sex of the individual, the most probable diagnosis was prostate cancer.

Prostate cancer is a primary carcinoma and seen to commonly metastasise to the bone and particularly to the spine.¹³ The estimated age for this male was only possible to base upon dental attrition, placing him in the age category of 26–35 years. However, dental attrition has been shown to significantly under-age adults from post-medieval sites¹⁴ with the changes in diet from one of attrition to softer food



Fig. 4: amputated and atrophied right humerus of female [341]

stuffs and increasing rates of dental decay. This type of metastatic cancer generally affects males over 50 and rarely those under 50 years.¹⁵ Cancers did affect past populations and were recorded on Bills of Mortality, but the seemingly lower prevalence rates than those seen today could be attributed to several factors,¹⁶ but more probably to a lower life expectancy.

Surgery

The right arm of a female [341] (aged 26–35 years) had been amputated at the mid-point of her right humerus (upper arm) (Fig. 4). Amputations may be seen to be as a consequence of surgical intervention, accident, interpersonal violence or punitive punishment.¹⁷ They are recorded in archaeological assemblages but not with a notably high frequency.

What remained of the bone of the right humerus had been damaged in the

burial environment making examination of the amputated area difficult and particularly in relation to establishing the degree of healing and stump formation. The humerus was markedly reduced in size from bone atrophy (waste), indicating lack of use and demonstrating that amputation had occurred some considerable time before death.

The two most probable explanations for this would be as an act of surgical intervention if she had suffered from an infection or injury or a work-related accident. To have suffered an amputation is a serious trauma and particularly so in the past with the rudimentary surgical and medical techniques available and the biggest risk of contracting an infection ultimately leading to your demise. For this woman to have survived is testament perhaps to the success of a skilled barber-surgeon and well-

appointed medical procedure or her own natural resilience. The presence of such surgery adds not only further insight to the life of the individual themselves but potentially in a wider perspective to the understanding and development of medical practice.

Accident or execution?

Probably the most intriguing osteological discovery from the assemblage was noted in a redeposited adult male skull [427] that was found in isolation with no associated post-cranial elements or any other skeletal remains. The dentition that was present in the maxilla (upper jaw) did not have marked wear, suggesting a younger adult, although this interpretation should be treated with caution as no other criterion for ageing was present.

The presence of two particular features on the skull raised the question: accident or execution? There was a peri-mortem (around the time of death) fracture that affected the base of the occipital bone (back of the skull) and trepanation, a single drilled bore hole that was superior to the fracture site. The fracture emanated on the base of the skull from the foramen magnum on the right side and the missing area of fractured bone produced a 'V' shape (length 37.9mm on the inner side and 40.5mm on the outer side). The edges to the fracture were smooth on the outer edge with a sharp edged projection to the inner fracture line. The indication that it was a peri-mortem fracture as opposed to post-mortem damage was based upon the edges of the fracture and the coloration of the edges that were compatible to the skull as a whole. There was also a radiating fracture following from the base of the 'V' ending at the left lambdoid suture (Fig. 5). Radiating fractures are a feature observed in cranial trauma and so it is perhaps not surprising to see one associated to this trauma, but it could also be because the base of the affected area was weak and the fault line was post-mortem damage.

This type of fracture (a basilar fracture), is rare and generally caused by blows to the back of the head or sudden deceleration of the body but not the head. If survived they can have serious consequences with brain injury. In the present day they are a common



Fig. 5: skull (male) [427] with peri-mortem fracture and trepanation on occipital bone

cause of death in modern auto-racing accidents.¹⁸

Trepanation, removal of an area of skull, was carried out far back in antiquity with evidence of a variety of methods used but also, perhaps surprisingly, a high rate of survival for those operated upon.¹⁹ The uniform nature of the trepanned hole in this skull indicated that it had been produced by a drill. The bore hole was sharply defined and circular in shape measuring 20.8mm x 20.9mm with an internal lip. Trepanation using a drill (trephine) has also been recorded in individuals excavated from the cemetery at St Pancras and in dissected remains at the Royal London Hospital excavated in 2006.²⁰ The edges of the trepanation did not exhibit any evidence of healing and so, if this was an attempt to alleviate pressure within the skull resulting from the head injury, unfortunately this man did not survive.

An alternative explanation for the cause of the trauma at the base of the skull could possibly be attributable to an execution by hanging. The drilled trepanation could then be related to surgical practice which was known to be carried out on criminals.²¹ The fact that the skull was found redeposited and in isolation also adds further to the intrigue and raises questions. In terms of attempting to be more conclusive as to hanging being the cause of the trauma is problematical. There was no indication of a dislocation of the cranial sutures that has been noted as being a feature of individuals hung,²² and as there were no post-cranial elements it was not possible to establish if there had been a 'hangman's' fracture of the second cervical vertebrae. The skull and its compelling features will no doubt raise continued discussion.

The health of the population

An overview of the diseases and trauma affecting the other individuals found within this assemblage was that the most common amongst the adult individuals were non-specific infections, generally affecting the lower legs. 14.5% of adult individuals had non-specific infection of either one or both tibiae and degenerative joint disease, including osteoarthritis. Osteoarthritis was observed to affect the main load bearing joints of 13 adults

(four males, eight females and one individual of indeterminate sex), and two males suffered from secondary osteoarthritis caused by trauma. The vertebrae of the males were affected more by osteoarthritis and Schmorl's nodes (depressions in the vertebral body) than the females (males 7.4%, females 4.3%), which was also seen to increase in prevalence with age. This difference between the males and females could possibly indicate a difference in load-bearing stress and activity. Non-specific infections and joint disease are frequently observed in archaeological skeletal assemblages, with osteoarthritis today being the most common joint disease.²³ In this particular population other observed changes to the joints were predominantly located in the upper body with Rotator cuff disease of the shoulder affecting eight adults (10.5%) five males (13.5%) and three females (9.1%).

Trauma such as fractures to the bone, soft tissue injury and surgical intervention are often detected in archaeological skeletal remains. Incidences of trauma were identified predominantly in the upper extremities, ribs and vertebrae and were generally well healed. Three individuals had fractures in the upper post cranial, two with fractures in the lower legs, one nasal fracture, eight (10.5%) with rib fractures and vertebral fractures – three (3.9%) with compression and eight (10.5%) with avulsion (clay shoveller's). Dislocation was also observed in five adults and three males appeared to have suffered dislocation to the elbow. One male had a serious head injury from a massive blunt force blow to the left side of his head which produced such a force that it had a contra-coup effect, consequently causing trauma to the right side as well. Unfortunately, the skull was fragmented post-mortem but with reconstruction it was possible to establish information in relation to the trauma and that the impact of such an injury would no doubt have killed this man.

Diseases associated with excess and deficiency in the diet are often observed in the skeleton and one of the more commonly observed diseases of deficiency in skeletal remains is rickets, the result of a lack of vitamin D. The

condition is both dietary and closely associated with a lack of exposure to UV light, and became a problem in the polluted atmosphere of London.²⁴ Softening of the bones may lead to bowing of long bones, particularly the legs, and amongst these individuals there was an indication in five of the adults that they had suffered from rickets as children, resulting in the scarring of their long bones with bowing deformities. The number affected was small and may suggest that these people although living in the environs of London were living at a time not yet so markedly exposed to the problems of mass urbanisation.

The more notorious infectious diseases tuberculosis (consumption) and syphilis were known to be rife at the time with the former killing vast numbers.²⁵ Syphilis or the Great Pox is still a disease hotly debated and posed significant health problems across all social strata. Interestingly, although both of these diseases were prevalent at the time that the burial ground was in use there were no individuals with indicative bony changes to signify tuberculosis, and only two males who may possibly have exhibited bone responses symptomatic of syphilis. The seeming lack of tuberculosis and very low prevalence of syphilis could be attributed to a number of factors including the nature of the disease, burial sample size and excavated area.

For the time in which these individuals lived dental health and hygiene were pretty poor and, even though there were advances made, there did not appear to be a marked improvement in dental practice or health.²⁶ The dental disease calculus (mineralized plaque) was the most commonly observed and similarly affected both males and females. The decay of teeth (caries) amongst these individuals affected the females more than the males. Defects of the enamel, linear enamel hypoplasia, indicate a disruption to the enamel formation and signify a deficiency in the diet or childhood disease.²⁷ Such enamel defects when observable were more prevalent in the males, which was also the same for the presence of abscesses. Dental anomalies recorded were rotation, crowding and impaction, seen

in the third maxillary molar of the redeposited skull [427].

Lifestyle evidence

The interpretation of the skeletal analysis in relation to the archaeology and historical evidence provides an opportunity to place the individuals back into context, producing a richer and more complete impression of them as individuals. There are of course complications and pitfalls to be aware of which can often lead to certain aspects only being made as tentative suggestions.

Attempting to associate particular skeletal changes to an activity or occupation is problematical but it has on occasions been possible to make a link to an occupation.²⁸ Therefore, although only conjecture the observation of changes in three males where there was an enlargement recorded on one side at the elbow may suggest archery. This similar bony response was also found in some of the individuals from the mass grave from the Battle of Towton.²⁹ Equally the location and proximity of these individuals to the river may even allude to some of the traumatic responses in the upper extremities, such as the rotator cuff joint changes, being from the actions of working boatmen. This would have been a physically demanding role and the action of

rowing would have placed considerable strain upon the shoulders and arms.

The occurrence of non-pathological change in some adult individuals with alteration to the teeth and bones, notably the ribs and feet, signified changes with a more direct social connotation. For two women with deformity to the ribs, the most probable cause was from corset-wearing. Deformities observed in the foot bones such as Hallux valgus, a deformity of the big toe that leads to bunions, are an indication of restricted footwear and have been observed in post-medieval assemblages.³⁰ Although no cases of Hallux valgus were recorded, there were two individuals with alteration to the metatarsals and bony outgrowths on the plantar (base) surface, possibly indicating footwear that was too small and restrictive. With the introduction of tobacco in the 16th century,³¹ smoking became a popular habit and scooped facets in the enamel of the teeth of seven men are testimony to their habitually holding a pipe. One male [334] had pipe facets on both sides which were probably due to the presence of caries in his right teeth making drawing air to keep the pipe alight painful.

As a skeletal assemblage, the individuals from Royal Mint Square produced some notable and intriguing results and provided an interesting

insight into the environment and lives of some of the people living in the parish over three hundred years ago. The overall impression from the analysis of their skeletons would seem to suggest that they were relatively healthy, with a status indicating individuals associated with a more manual lifestyle rather than a higher social status. The impacts and insults affecting their lives was for some more graphically demonstrated, but taken as a whole it was possible to achieve an invaluable glimpse into their time and a better sense of them as individuals.

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