

A Lang Park mystery: Analysis of remains from a 19th century burial in Brisbane, Queensland

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Abstract

Salvage excavation of the Suncorp Stadium (Lang Park) redevelopment site in Brisbane revealed almost 400 graves. Originally known as the North Brisbane Burial Grounds, it was the site of Brisbane's principal cemetery between 1843 and 1875. A grave in the Anglican section of the cemetery yielded several teeth and associated non-dental bone fragments, and stature data derived from the coffin indicate a child burial. Observation of the stages of tooth eruption, resorption, and formation revealed evidence for two children, one aged approximately three years old and the other aged 12. An examination of the coffin furniture showed that the coffin was bought by a wealthy Anglican family, and DNA analyses suggest that the older individual was of Eastern European descent. These results suggest the burial of the older child in the same grave as the younger was most likely clandestine, and highlight the importance of post-excavation analyses to the interpretation of Australian cemeteries.

Introduction

Over the past 30 years only a handful of nineteenth century Australian cemeteries have been subject to archaeological investigation. Of these, the findings of excavations at cemeteries such as the Old Sydney Burial Ground (Lowe and Mackay 1992), the Destitute Children's Asylum at Randwick (Austral/Godden Mackay 1997), and Cadia cemetery (Higginbotham 2002), all in New South Wales, and St. Mary's cemetery in Adelaide, South Australia (Pate and Adams 2000; Coussens et al. 2002), have been important in developing an understanding of early Australian mortuary practices. This paper focuses on the study of one of the 391 burials excavated during the archaeological salvage of the nineteenth century cemetery beneath the Suncorp Stadium (Lang Park) redevelopment site in inner-city Brisbane, Queensland, between August 2001 and May 2002. The Suncorp Stadium salvage is by far the largest archaeological investigation of an Australian cemetery of this era (Rains and Prangnell 2002).

An apparent discrepancy in the number of teeth recovered from a small coffin in the Anglican section of the cemetery was investigated. This paper presents the methods and results of an examination of the teeth, supplemented by age and stature estimates and an analysis of the associated coffin furniture, followed by a separate section detailing DNA methods and results. This approach permits the integration of disparate techniques for the study of cemeteries to be focused on a single problem, namely, the 'mystery' of too many teeth in one small grave. The study also emphasises the importance of such integration in gaining important information from poorly preserved burials at nineteenth century Australian cemeteries.

Background

The Cemeteries

The North Brisbane Burial Grounds site was established in September 1843 as the first large cemetery for Brisbane's free settlers, and was the city's principal burial ground between 1843 and 1875 (Fisher 1994:36). Also known as the Milton-Paddington cemetery, the site witnessed the burial of thousands of people of all classes and religious denominations. Estimates based on newspaper reports and other contemporary sources put the minimum number of interments at 10,000 (Fisher 1994:52), although the ongoing archaeological analyses have reduced this figure to closer to 5000 (Rains and Prangnell 2002). The site has had a long and chequered history, involving politics, religion and emotions (Fisher 1995; Hayman 1994). Since European settlement, it has undergone transformations from a swamp to a cemetery to a parkland, been used as a circus venue, garbage dump and war-time camp, and finally as a multi-million dollar sporting facility (Prangnell and Rains 2001). By the 1950s, the site had been completely buried by years of landfill, and until the current redevelopment the cemetery had lain virtually undisturbed beneath the surface for over a century.

The original cemetery was subdivided according to religious denominations, into Anglican (Episcopalian), Catholic, Presbyterian, Jewish, Wesleyan, Independent (Congregationalist) and a separate Aboriginal cemetery (Figure 1). By 1860 the Anglican section had expanded to encompass the area originally set aside for the Aboriginal section. The cemetery rapidly grew overcrowded, however, and amidst health and sanitary concerns, the Burial Grounds were officially closed in August 1874. In 1914, the cemetery was finally converted to parklands, all headstones and monuments were removed and a small number were placed in a special 'memorial reserve' created at the site (Fisher 1994:47). The remaining headstones were destroyed or sold at auction (QSA PRV 9892/1 31 March 1914) and in the intervening years the

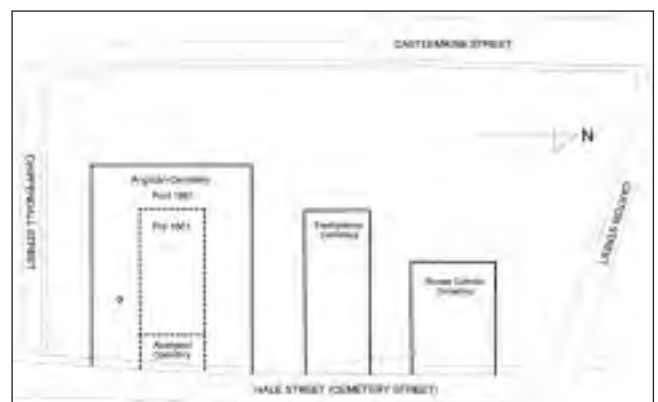


Figure 1 Layout of the North Brisbane Burial Grounds showing the locations of the denominational cemeteries. The location of the burial discussed in this report is marked with a cross.

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majority of headstones from the memorial reserve have also disappeared. At this time, the remains of 99 individuals were relocated to other cemeteries in Brisbane (Fisher 1994:47), although no plot and burial register information could be found. Despite extensive searches during the cultural heritage planning stage of this project, the registers still could not be located, which suggests that they almost certainly no longer exist.

The Salvage

As procedures employed for the detection, excavation, recording and storage of the Lang Park archaeological remains are described elsewhere (Prangnell and Rains 2002; Rains and Prangnell 2002) only a short overview is provided here. Following the removal of surface structures and topsoil, the field crew monitored the shallow scraping of the ground surface by mechanical excavators. Machines were used for their efficiency in removing the largely clay soil/phyllite bedrock of the site, in a similar strategy to that employed at Giddings Cemetery, Texas, USA (Owsley et al. 1997:212), and at Cadia Cemetery, New South Wales (Higginbotham 2002:34). Mechanical scraping was carried out in all areas of the site where the redevelopment was identified as extending below the original 1914 ground levels of the Lang Park cemetery. Following the observation of 'grave stains' (patches of earth differing in colour and texture from the surrounding sediment, and generally rectangular in shape), the sediment comprising the stain would be scraped away until coffin wood or bone was detected. Further excavation was carried out by hand, and any human skeletal material was recorded, collected and transported for storage and analysis in the University of Queensland's Anthropology Museum.



Figure 2 The burial at the completion of excavation.

The Burial

On 19 September 2001, scraping of the bedrock in the south-east of the Anglican section of the Lang Park cemetery revealed a small rectangular stain. This stain was scraped back with a mechanical excavator until the outline of a wooden coffin began to show through the sediment. Over the course of 19-20 September, the coffin and its contents were excavated (Figure 2), revealing very little skeletal material. Apart from 34 extremely fragile bone fragments held together by the clay matrix, there were 36 teeth, all of which were located in the head area of the coffin. The total weight of the non-dental bone was 9.76 g, giving a mean weight of 0.29 g, with the largest fragment measuring 28.2 x 15.5 x 11.3 mm. None of the non-dental bones could be identified to specific skeletal element.

The poor preservation of the remains mirrors that of the vast majority of the burials at the site, and is attributed to acidic groundwater (Prangnell and Rains 2002:25-26) and heavy metal contamination (Loy et al. 2003:22). The coffin itself measured 92cm in length and possessed six metal handles, metal nails, and the remains of a thin metal depositum or plaque. The coffin lid had collapsed inwards, and the remaining internal space was entirely filled with sediment. Apart from the collapsed lid and groundwater movement, no other post-depositional disturbance of the grave shaft or coffin was identified. From the size of the coffin, the burial appeared most likely to be that of a child.

Initial counts and morphological analysis of the teeth raised as many questions as were answered, and it became clear that much more could be learned from this burial by including a variety of different methods in the analysis. By employing this approach, the results of this study may provide information relevant not just to this one burial, but to mortuary and genetic analyses undertaken elsewhere.

Methods

Teeth Identification

Visual identification and assessment of eruption and growth stage was undertaken on all 36 teeth recovered from the grave. The teeth were classed according to tooth type, and whether they were deciduous (primary or milk teeth) or permanent, to identify the minimum number of individuals in the sample. Additionally, the developmental stages of the various teeth were identified (Hillson 1996; Berkovitz et al. 1978; Osborn 1981; Schour and Massler 1941), to provide an age range of the interred individual(s).

Stature/Age Estimation

Owing to the lack of intact skeletal material, age estimation of the individual was inferred from a maximum stature estimate based on the interior length of the coffin (Prangnell 2002). This approach has two main caveats – (1) human heights have gradually been increasing over the past two centuries (Mays 1998:69), and (2) coffin length may not always correlate with height (e.g. Nicol 1985:5); it is possible that the individual was forced into a coffin smaller than necessary or was placed in a coffin too large for them. Having noted these limitations, however, it has been shown that the coffin lengths of other burials from Lang Park do correlate strongly with stature estimations based on osteological measurements, where skeletal preservation was sufficient to allow measurements (Haslam and McKeough 2002a).

Age estimates based on stature can be problematic as most available data come from modern populations, while it is known that these populations are taller on average than those of 150-200 years ago. Broadly speaking, it has been shown that for children, differences in height stem from environmental influences more than any other factor (Eveleth and Tanner 1990; Martorell and Habicht 1986:244). The estimations therefore take into account available data on the heights of children in the 1800s, using three datasets from nineteenth century England. The first of these was collected by the Marine Society of London, a charity which found sea-going jobs for the poor children of London. Between 1770 and 1870 about 50,000 boys were helped by the Society (Floud 1988). The second data set was collected by the Royal Military Academy at Sandhurst beginning in 1806, and differs in one important respect from the Marine Society data in that the Sandhurst

recruits were the children of the aristocracy. The third data set is a compilation of the heights of nineteenth century working class children from a variety of locations across England (Floud et al. 1990:173).

In addition to data on increasing height, there is a possibility that in some cases individuals were placed in coffins of lengths unrelated to their height, effectively skewing stature estimations. This practice is documented historically by Nicol (1985:5) in 1874 at West Terrace Cemetery in Adelaide, South Australia. No evidence for this practice was found at Lang Park.

Coffin Furniture

The six iron coffin handles possessed surface corrosion, but were otherwise well-preserved. No evidence of the handle backing plates survived. Coffin furniture such as handles can be used to provide an indication of the social standing of the family responsible for the burial. In the mid-nineteenth century standard sets of coffin furniture were available for purchase, with cost determined by the elaborateness and weight of the metal pieces (Church and Smith 1966). Nails and handles weighing a total of 10 ounces (283.5 g) were usually the only metal components of a lower-class coffin. As the price increased, items such as a depositum and metal lacing around the coffin were included, and the weight and sturdiness of the handles and nails increased. A standard middle-class coffin therefore carried around three and a half pounds (approximately 1.6 kg) of metal, and an upper-class coffin about nine pounds (approximately 4 kg). Weights of the metal components of child coffins were less, as they often had fewer handles and smaller components overall. For example, standard adult burials recovered from Lang Park had eight coffin handles, whereas those child coffins found with handles had only six.

Results

Teeth Identification

The results of the morphological classification of the 36 teeth recovered from the grave are displayed in Table 1. In certain cases, the classification into deciduous or permanent was unable to be determined due to poor preservation, and these are indicated on the table. There were five fragments, mostly root pieces, which could not be identified to tooth type. Given the lack of pre-molars identified in the sample, there

remains a possibility that some of the unidentified teeth are in fact pre-molars. No evidence of caries, cultural abrasions, or staining was present.

Hillson (1986:190-191) identifies 18 stages of human dental development, from birth to full adult dentition. Two of the tooth types in the sample were particularly informative when classified according to these stages (Figure 3). The latest possible stage represented by the deciduous lower central incisor, which has no evidence of root resorption, is stage 7. This occurs at an age of 3 years \pm 6 months. The lack of root resorption cannot occur in an individual whose deciduous teeth had naturally fallen out, which happens for this tooth type at a later stage. On the other hand the second molars in the sample, which have almost complete root formation, represent at least stage 16. This occurs at the age of 12 years \pm 9 months. There is a discrepancy therefore of some eight years between the two, an irreconcilable divide in the one person. While it is theoretically possible for a child to have over 36 teeth in various stages of development in their arches at the one time, it is not possible for one person to possess the two stages represented in this sample. Dental development stages therefore suggest the teeth of at least two individuals (if not the individuals themselves) were buried in this grave.

As well as revealing dental development stages, the visual analysis demonstrated that there were simply too many specimens of certain teeth to belong to one person. In particular, the number of canines (10 in total), and the number of molars both exceed the maximum number to be expected in normal human dentition. Even taking into account the loss of deciduous teeth, and the possible interment of these teeth with the person who lost them, the numbers recovered from the one grave are still too high.

The conclusions drawn from the visual identification show that more than one individual is represented by the remains. The reasons for this are twofold: (1) there are too many canines and too many molars to belong to one person, even accounting for deciduous and permanent teeth from the one individual; and (2) there is no root resorption of the primary central lower incisor, while simultaneously there is advanced development in the roots of the three permanent second molars. This cannot occur in the same individual. More specifically, it appears that the teeth of both a two to four year old child and an 11-13 year old child have been interred in the one grave.

Tooth type	Deciduous/Permanent	Number present	DNA sample
Lower central incisor	Deciduous	1	1
1st molars	Deciduous	4	2
2nd molars	Deciduous	4	2
Upper central incisors	Deciduous	2	-
Upper lateral incisor	Deciduous	1	-
Upper canines	Indeterminate	5	2
Lower canines	Indeterminate	5	2
Molars	Indeterminate	2	-
1st molars ('6-year molars')	Permanent	4	-
2nd molars ('12-year molars')	Permanent	3	1
Upper lateral incisor	Permanent	1	-
Upper central incisors	Permanent	2	-
Lower incisors	Permanent	2	-
Unidentified fragments	Indeterminate	(5)	(2)
Total (excluding unidentified fragments)		36	10

Table 1 Teeth recovered from the grave by tooth type, number present, and whether or not the tooth was used for DNA analyses.

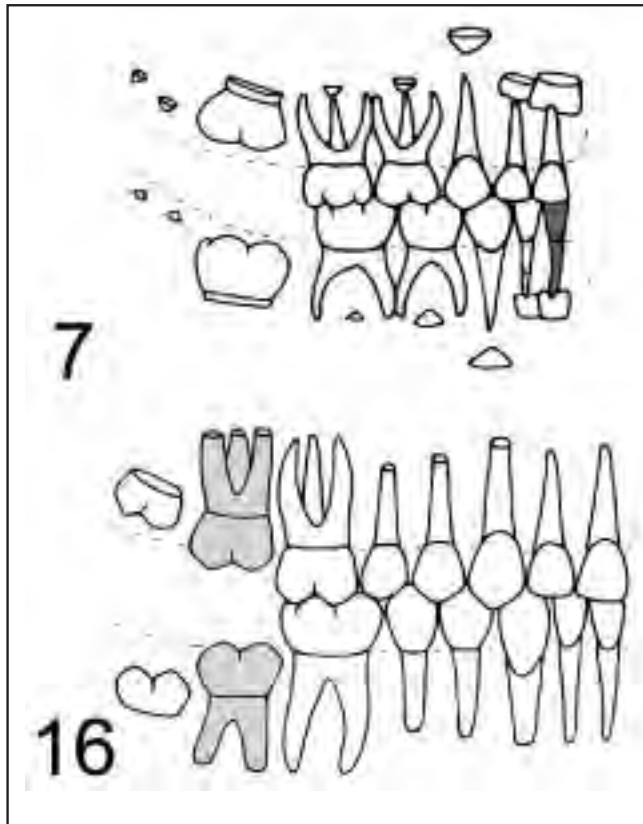


Figure 3 Incompatible stages of tooth development in teeth recovered from the grave. Note the lack of root resorption on the deciduous lower central incisor at stage 7, contrasted with the complete root formation on the permanent mandibular second molars, and almost complete root formation on the maxillary second molars at stage 16.

Stature/Age Estimation

The internal length of the coffin as measured *in situ* was 92cm. Owing to a poor state of preservation, the coffin itself was not recovered. The coffin length and modern child heights were compared with stature data from the three sources outlined above. In most cases, data for modern heights have been sourced from the United States National Centre for Health Statistics (U.S. Department of Health and Human Services 2002), which are recommended by the Australian National Health and Medical Research Council as applicable to Australian children (Hill 2003). The data have also been checked against those supplied by the Victorian Department of Human Services (2002).

Owing to sample sizes, data for both the Marine Society and Military Academy are statistically reliable only for boys aged 13 years and older. At the time of the opening of the North Brisbane Burial Grounds in 1843, the average height for 13 year old Marine Society boys was just over 140cm (Floud et al. 1990:167). In comparison, 13 year old recruits at the Royal Military Academy at Sandhurst averaged over 150cm throughout the second half of the nineteenth century (Floud et al. 1990:176). Plotting these figures against their modern same-age equivalents (boys 156cm and girls 157cm), the Sandhurst children are only 5cm below the modern average, whereas those of the Marine Society are some 15cm below.

Perhaps of more relevance are those statistics drawn from the working-class children of both sexes in the third dataset.

Heights for nineteenth century working-class children show that even at age nine (the youngest age for which statistically reliable data are available), all children averaged at least 120cm tall (Floud et al. 1990:173). Today, children of the same age would stand 133-134cms for both boys and girls. It is therefore clear from all available data that the occupant of the Lang Park coffin should be well under nine years of age. Also based on the above figures, a conservative average of 5-10cm difference in child height between the mid-nineteenth century and today appears reasonable. This means that a child standing, for example, 120cm today is of a similar age to a child standing 110-115cm in the mid-nineteenth century. A modern Australian child of either sex standing 90cm tall would be approximately two and a half years old. Applying the 5-10cm differential, the age of the child buried in this grave was three to four years at time of death.

Coffin Furniture

The aim of the coffin furniture analysis was to determine the socioeconomic status of the burial. The six metal handles were cast iron, weighing approximately 28 g (1 oz) each. Including the depositum and nails found with the coffin, there would have been eight to ten ounces of metal attached to the coffin. These figures suggest the coffin belonged to a middle class child as the total weight of the metal used was equivalent to that of a lower-class adult, whereas a lower-class child would have had less metal due to the scale of the fittings (Aitken 1866:706). Also, the inclusion of a depositum suggests that the family were unlikely to be poor, as all metal coffin furniture of the time was imported from Birmingham in the United Kingdom (Church and Smith 1966), and burying metal plaques with the dead would have been an extravagance.

DNA

Methods

Following confirmation via inspection of the teeth that there was more than one person buried in the grave, a program of DNA analysis was begun using selected teeth and bone samples. Twelve teeth (including two tooth fragments) and two bone samples were included in the analysis, with samples taken from the pulp of the tooth using dental picks and scalpels. This procedure preserved the form of the crown of the teeth for possible future analyses. The initial hope was to recover DNA from each of the individuals present, and to assess their degree of relatedness. Population genetic analyses were also conducted to broadly determine the region of origin of the grave's occupants. No attempt was made to sex the bodies using molecular techniques due to financial constraints.

The recovery of ancient DNA from the Lang Park remains was initially problematic owing to contamination of the site with heavy metals in the soil and groundwater. The presence of certain heavy metals can inhibit DNA amplification reactions causing them to fail (Yang et al. 1997). To counteract the effects of this inhibition, a new extraction process was developed based on a modified silica bead extraction technique (Boom et al. 1990; Haslam and McKeough 2002b; Loy et al. 2003). The differing location of the burials, however, meant that some graves were exposed to much higher concentrations of heavy metals than others, resulting in failure of the extraction process in these cases.

Following extraction, amplification of a 191 base pair section of the hypervariable region 1 (HVR1) of the mitochondrial control region or D-Loop was conducted under

stringent control conditions. Primers developed specifically for eliminating amplification of contaminating DNA were used (Dr. Carney Matheson, Lakehead University, pers. comm. 2001). These primers consisted of two monomers of 20 base pairs each: Mt16210 (5'-CCCATGCTTACAAGCAAGTA-3') and Mt16401 (5'-TGATTTACGGAGGATGGTG-3'). Polymerase Chain Reactions (PCRs) (50µL) containing 1µL template solution (unquantitated), 2mM MgCl₂, 0.2 mM each dNTP, 20 pmol each primer, and 1.5 U QTaq DNA polymerase in 1µL Q Solution (Qiagen) were carried out in a Biorad iCycler thermal cycler. PCR conditions were one cycle at 94°C for three minutes; 47 cycles (94°C for two minutes, 60°C for one minute, 72°C for two minutes); and one cycle at 72°C for two minutes. Negative and positive controls were used and all laboratory technicians and excavators were sequenced to control for contamination.

Results

Of 14 samples extracted from the teeth and bone fragments, only three showed traces of DNA. These three were then sequenced with only one sample (designated LPT15) producing a sequence useful for the population study. The other two sequences returned too many indeterminate bases. Obtaining only one clear sequence prevented the reconstruction of relatedness between the two individuals, but still allowed the population study to proceed. The sequence was aligned with human mitochondrial sequences obtained from the HVR-BASE: mtDNA Database (Handt et al. 1998) using the programs Sequencher 4.1 (Gene Codes Corporation) and Macvector 7 (Accelrys Inc.), with phylogenetic analysis conducted using PAUP 4b10 (Sinauer Associates Inc.).

The LPT15 DNA sample was taken from the best preserved and largest of the non-dental bone fragments recovered from

the burial. Through comparison with skeletal preservation of other child burials at the site, it is extremely unlikely the bone belonged to the three year old child, and it is therefore almost certainly from the 11-13 year old. Preliminary phylogenetic results indicate that the DNA originated from an individual of Eastern European origin, most likely from the Balkan region (Figure 4). This is an extremely interesting result as the grave was found within the Anglican cemetery, yet Eastern Orthodoxy, Islam, and Roman Catholicism were the dominant religious forces in the Balkan states at the time (Hupchick 1994). While there is very little evidence for the spread of Anglicanism within Eastern Europeans in the mid-nineteenth century, the assimilation of Eastern European genetic material into Anglican populations of the time cannot of course be ruled out.

In Australia, Anglicanism has throughout its history displayed a heavy middle to upper-class white Anglocentric bias (Frame 2002:121). Even into the 1990s, the Australian Anglican church was still coming to terms with members from non-English backgrounds (Hilliard 2002:144), and nineteenth century church leaders advocated a proto-White Australia Policy (Fletcher 2002:307). If any nationality other than British was represented in a nineteenth century Anglican congregation, it would likely have been Irish or Scottish (Fletcher 2002:296). It is therefore highly improbable that an Eastern European child would have been part of the Anglican community in nineteenth century Brisbane. Of course, it must be stressed that these results are preliminary, and further DNA work must be done before more definitive conclusions can be drawn.

The Anglican Cemetery

Several important pieces of information can be added to this puzzle by a brief examination of the Anglican cemetery at Lang Park, and the burial practices carried out within it. First, the location of the child's grave provides a date-range for the burial. As noted above, the Anglican cemetery was expanded on all four sides in 1860 (Fisher 1994:38). The location of the burial clearly falls into the southern expanded region of the cemetery (Department of Natural Resources CS7, 1860), thus providing a *terminus post quem* of 1860 for the burial, and a *terminus ante quem* of 1874, the date of closure of the cemetery.

Second, consideration needs to be given to the practice of burying multiple bodies in the one grave shaft. Although no historical documents have been identified which demonstrate that multiple burials were carried out specifically within the Anglican cemetery at Lang Park, there is evidence for the practice being used at the site in general. Commenting about the unhealthy crowding of the cemetery in 1864, the *Brisbane Courier* (23 September 1864) reported that, "any shallow hole there suffices for a grave, and coffins are piled one upon another, and covered with only a few inches of earth in a manner revolting to humanity." In addition, the salvage excavation uncovered five multiple burials in the Anglican section. Two of these cases involved children buried in separate coffins one atop the other in the same grave shaft, the others involved adult burials or coffins of indeterminate length.

Evidence does exist for multiple burial at other contemporaneous Australian cemeteries. For example, during an 1854 parliamentary enquiry into West Terrace Cemetery, South Australia, evidence was given that ditches were filled with the bodies of the poor and then covered over (Nicol 1985:5). This situation arose because undertakers were contracted by the government to inter the deceased who could

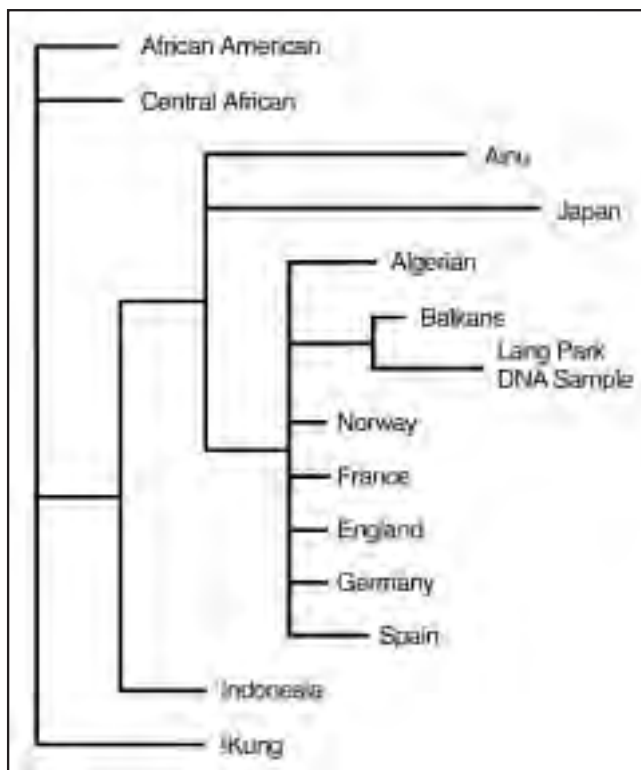


Figure 4 Phylogenetic tree displaying the results of the DNA population study. The Lang Park DNA sample is genetically most similar to people from Eastern Europe.

not afford private burials. Similar practices could have taken place at the Lang Park cemetery, where there is evidence of improper burial due to the lack of a regular undertaker, and at times, no Anglican minister to conduct services (Fisher 1994:40). As another example, multiple burial in the one grave shaft was noted on twelve occasions at Cadia Cemetery (Higginbotham 2002:36).

Multiple burial of Anglicans was also practised at East Perth cemetery and at St. Mary's in Adelaide (Tim Anson, PhD. Candidate, University of Adelaide, pers. comm. 2003). The Church of England notice establishing the East Perth burial ground in December 1843 explicitly states that, in the case of free graves, spaces are "to be used in the order numbered on the plan [until all graves are occupied]... after which a second tier is to be placed over the first, commencing at No. 1 and proceeding in same order as before, completing as many tiers as super-soil will admit" (*The Perth Gazette and Western Australian Journal* 23 December 1843:4). Clearly the Anglican church of the time both accepted and employed the practice of multiple burial, although no records exist officially sanctioning the practice at the North Brisbane Burial Grounds.

Discussion

By drawing together the varied strands of the study a picture of the occupants of the grave begins to emerge. From both the age/stature estimation and the identification of teeth development, it appears that a three to four year old child was buried in his/her coffin, sometime between 1861 and 1874, on a hillside in the southeast corner of the Anglican cemetery at the North Brisbane Burial Grounds. In Australia in the late nineteenth century, infant mortality rates stood at well over 100 deaths per 1000 births (Whitwell et al. 1995:27), so the burial of an infant child would have been an all-too-common event. What was not common, however, was the set of circumstances leading to the mixing of the remains of that three year old with, at least, the dentition of a 12 year old child. What could lead to this situation?

Several possibilities can account for the facts, although many are implausible in practicality. For example, two children may have been buried in the same coffin. No known records from any nineteenth century cemetery record this practice, and in the case of Lang Park, several cases were found of children buried in separate coffins side-by-side in separate grave shafts, suggesting this was the preferred option. A second possibility is that the remains of one or both of the children were cremated, then placed together in the coffin. This is not considered a realistic possibility as (1) the teeth and bone fragments showed no sign of blackening created by carbonisation of collagen, or whitening formed by subsequent oxidisation of the carbon (Lyman 1994:385), and (2) cremation was not introduced into Australia until after 1900 (Church and Smith 1966), well after the North Brisbane Burial Grounds closed.

Other possibilities unsupported by the evidence include the prospect that both children were injured in an accident, and only portions of the bodies were recovered; that only the teeth and cranium of a 12 year old were interred with the three year old for whatever reason; that the remains of the older child were exhumed, then placed into the younger child's coffin; or that the remains of a legitimately buried 12 year old have migrated downwards through taphonomic activity to end up in the coffin of the younger child. None of these are considered to be legitimate possibilities.

The most likely explanation is that the older child was buried surreptitiously and without a coffin in a grave already

containing the three year old child. It is important to note here that there is no archaeological evidence of a second coffin in the grave shaft. In addition, the size of the grave shaft was not sufficient to have held a larger coffin, which would have been almost 140cm in length for a 12 year old child. Despite the evidence mentioned previously for multiple child burial at Lang Park, in those cases there were clear remains of both coffins and no mixing of skeletal material between the two individuals. All skeletons found in coffins during the excavation were horizontal, and did not show any downward movement. There is abundant evidence, however, of coffin lids collapsing inwards due to the weight of the soil above them. It is possible, therefore, that the 12 year old child was placed on top of the smaller coffin, and as the coffin disintegrated, the older child's bones fell into the coffin. In this scenario it is pure chance that all the dental remains have settled in the same area, confusing the interpretation of the burial during excavation.

The evidence showing the coffin belonged to a middle to upper-class person compliments the above scenario. If the grave shaft had been a family plot, it could reasonably be expected that all burials in the shaft would display a similar level of wealth through their coffin and its fittings. The complete absence of any coffin materials for the older child lends weight to the conclusion that the two children were most likely unrelated, and that the burial of the older child was in fact clandestine. This conclusion is similarly supported by the DNA study showing the older child to be of Eastern European descent. Given the remote likelihood of Eastern European involvement in the Anglican church of the time, the case for illegal burial of the older child is strengthened.

Conclusions

This study highlights the importance of post-excavation analyses to the study of burials from Australian cemeteries, particularly in cases where poor skeletal preservation hinders interpretation in the field. Initial assessment of attributes even as seemingly simple as the number of occupants of a coffin should be checked following excavation. The seemingly innocuous discovery of several teeth in one small grave has led to the reconstruction of a plausible scenario, in which a 12 year old of Eastern European descent has been buried illegitimately in the grave of the child of a well-off Anglican family. It is only through the variety of approaches applied to the one grave that such a detailed picture has been established. While each of the pieces provide only a small piece of the mystery, together they create a picture which can be used as a means of comparison with historical records, and to other archaeological studies of Australian cemeteries.

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