Reconstructing the demography of medieval London from studies on human skeletal material: problems and potential

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SUMMARY

Since the 1970s a number of medieval cemeteries have been excavated within the Greater London Area. This paper offers a brief introduction to the demographic information that the analysis of this material has revealed to date.

INTRODUCTION

The impetus for this paper came from the large number of human skeletons, recovered from archaeological sites in London, the subject of recent study. The organisers of the CBA Medieval Conference concluded that it should be possible to discuss the demography of medieval London, drawing on this substantial body of data.

Details from around 2,500 medieval skeletons have been recorded at the time of writing. Another 2,000 from this period are held in the Museum of London archive awaiting analysis, and there is the strong likelihood of something approaching the same number requiring excavation in the near future. First impressions would therefore certainly seem to suggest that it should be possible to infer some impression of the demography of medieval London from this analysis, where demography is taken to mean any statistics that illustrate the condition of the community. However, interpretation of the data is not quite so straightforward. This paper aims to illustrate the problems associated with trying to reconstruct the demographic profile of medieval London from evidence provided by skeletal samples, using case studies from a number of current projects. Secondly, the paper also outlines the type of information that the research can more reliably provide, with some of the more notable findings highlighted.

THE DIFFICULTIES IN EXTRAPOLATING FROM CEMETARY SAMPLES TO THE LIVE POPULATION

In an ideal scenario, in order to make reliable inferences regarding the whole population of medieval London using data gathered from skeletal analysis, the study sample should be randomly collected across all the geographical and social divides of that population. Realistically, this situation is a long way from being achieved. It might be proposed that some educated guesswork or licence is allowed, to enable at least some impression of the population to be arrived at, but the available sample is so biased that this is not possible.

The sample recovered is not usually a random selection for several reasons. Excavation organisations cannot generally choose where to dig since excavation locations are usually dictated by building works taking place. Consequently, the skeletons recorded to date were excavated from 14 sites, 11 of which had monastic connections. Such specialised sites cannot provide a random sample as the sample is culturally, rather than biologically determined. Rules governing who could be buried in these cemeteries are likely to have been in force, so the burial sample does not provide a true cross-section of the population as a whole. In addition, the building works may not

include the total area of the cemetery, or permission may not be granted to remove all burials from the excavated area, only a specific portion. If there was any segregation practised in the layout of the cemetery with regard to what type of people were buried in certain areas, there is again a danger of recovering a skewed sample. This is known to have happened at more than one of these 14 sites.

In addition to being randomly selected, a sample needs to be of sufficient size to be representative of the population from which it is drawn. Estimates of the population of medieval London vary, but taking what could be regarded as a consensus opinion (*Times Atlas of London*), the population was already substantial by the 12th and 13th centuries and, with rapid growth, reached a peak of around 80,000 in the 14th century. The originally impressive number of 2,500 skeletons studied accounts for just 3% of a population this size, and in fact represents an even smaller proportion, as those skeletons included in the analyses derive from sites dating from the 12th through to the 16th century, rather than from the 14th century exclusively. This is not, therefore, a reliably representative sample.

The preservation of the remains also varies between sites. This is important as the condition of the skeletons determines the amount of information that can be recovered during analysis. Burials may have been disturbed by post-burial activities to varying degrees at different sites, or the differing soil conditions may have affected adversely or, alternatively, preserved the bone. Again this may skew the data, with more information recovered from one site, where a particular type of person may be represented, than from another.

Finally, the apparent characteristics of a dead population are different from the same population in life, as only those characteristics that are evident from the skeleton are available to us. Hence we are left with a very fragmented picture of the whole. For example, only chronic pathologies tend to leave evidence of their presence on the skeleton. The majority of acute conditions, other than trauma, would not have had time to cause bone remodelling. Taken at face value, therefore, the skeletal pathology present in a sample would give a very odd impression of the range of diseases and other conditions affecting the living population. In addition, this base range of pathology could differ between the groups of people from each of the excavated sites, as the pathology each group is exposed to will reflect the environment in which they live, geographical and climatic influences, and their interaction with the environment and with competing or co-existing forms of life (Manchester 1992, 8).

Perhaps this misrepresentation of the true picture is most clearly illustrated in that the demographic characteristics of a dead sample in London, in terms of age profile, will rarely be the same as the probable profile of the living population from which it is drawn. Fig 25 shows three age-at-death curves, the first two diagrammatic, the third illustrating actual data. The first, that of an affluent society with access to modern medicine such as modern Britain today, has the appearance of an exponential curve. A very small proportion of the population dies before 45 years of age, and relatively few die in childhood. The second, that of a relatively poorer society without access to modern medicine, presents a very different U-shaped curve. Many children die before the age of five years, fewest die in young adulthood once they have survived childhood, and then the death rate increases again with age. Many factors contribute to this picture; poor sanitation, diet, living conditions, medical care *etc*. The final curve is derived from data collected from the skeletal remains from St Brides Lower Churchyard, Farringdon Street, London (Conheeney and Miles in prep). This site has been selected, despite the fact that it is of post-medieval date, because it is known that 95% of those who died in the parish it served were buried in this cemetery. It is therefore probably as close to a representative sample of that parish as it is possible to obtain. Note that this curve corresponds to the death curve for the poorer, pre-modern medicine society, as may be expected. The deviations from the diagrammatic curve probably reflect the widely acknowledged problems associated with estimating the age of adult skeletal material with any degree of precision.

Fig 26 presents the data from six medieval samples in the same way. It is immediately apparent that none of these curves correspond to either of the diagrammatic curves, whereas it may have been predicted that they would all conform to the curve postulated for a poorer pre-modern medicine society, as in the case of St Brides Lower Churchyard. Five of the six are monastic sites (St Nicholas Shambles, a parochial cemetery (White 1988; Schofield 1997), being the exception), so an initial conclusion may be that

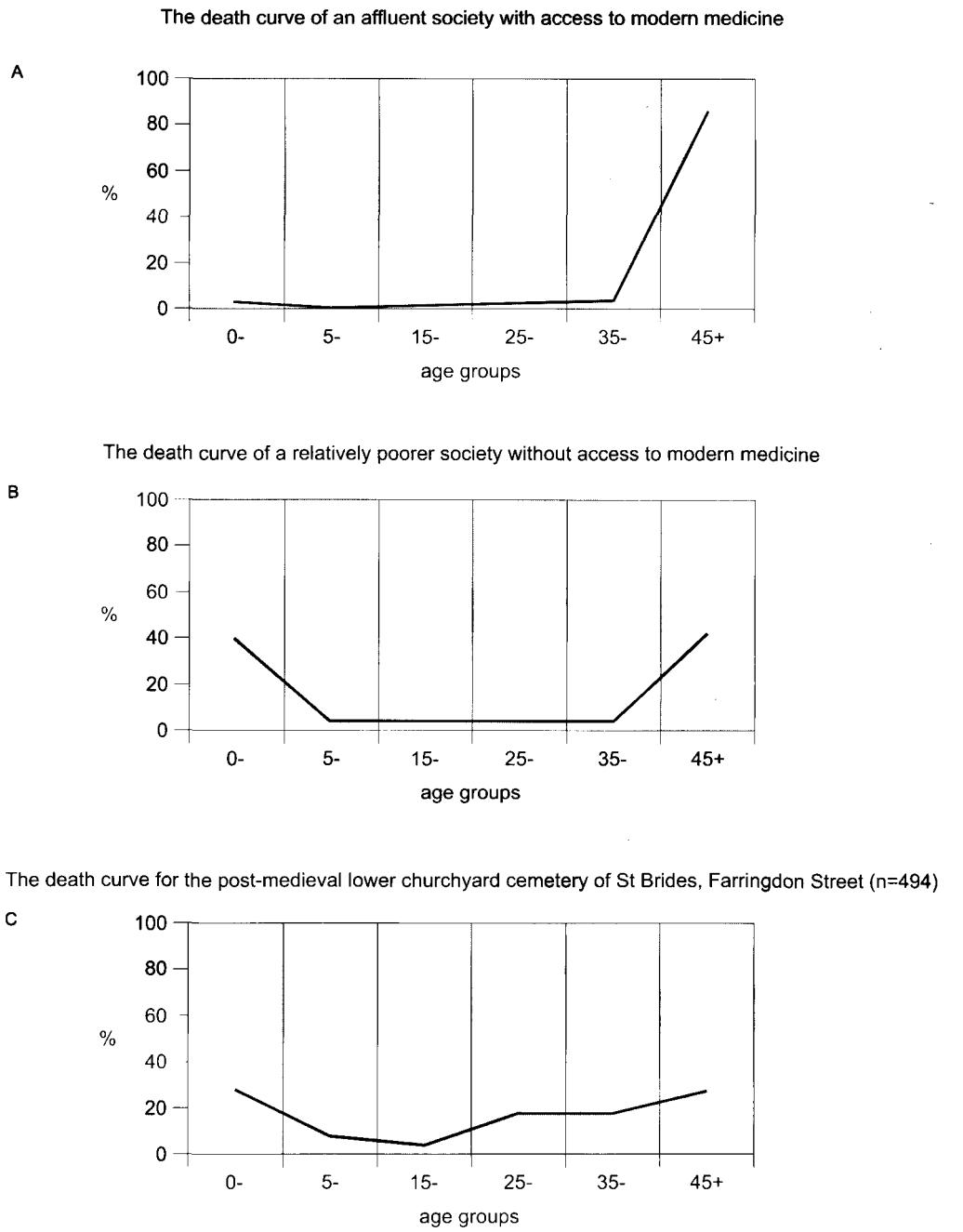

Fig 25.

the curves demonstrate that the samples are all hopelessly skewed and non-representative of the London population as a whole and therefore worthless. Whilst it is true that it would be unwise to make population-wide inferences based on this data, the curves are in fact valuable on a site-specific level because of their deviations from the expected. That is, the deviations from the predicted can be used to suggest particular uses of specific sites, according to the composition of the people selected for burial in that cemetery.

For example, the data illustrated in the St

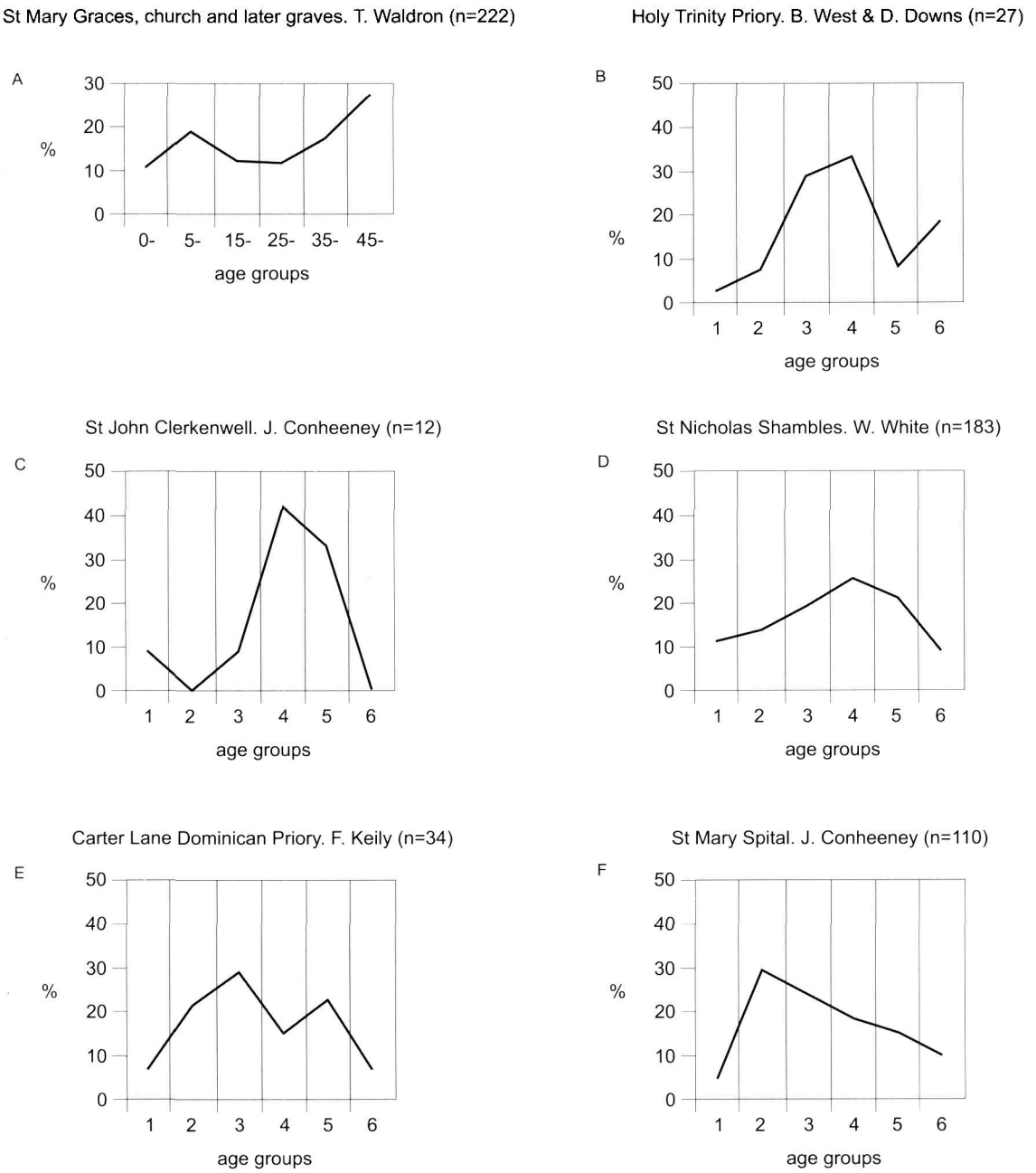

Fig 26.

Mary Spital (see Fig 1, **30**) curve can be broken down to produce three curves corresponding to those buried inside the church and two phases of the external cemetery (Fig 27). Bearing in mind that the first and second of these curves are based on very small sample sizes, it is nevertheless interesting that the three curves take on very different appearances. Discussion with the archaeologists supervising this site revealed that the differing curves could well have corresponded to the changing role of this monastic hospital over time. The first curve, that for those buried within the church, revealed a majority dying in older age and no infants (they were also predominantly

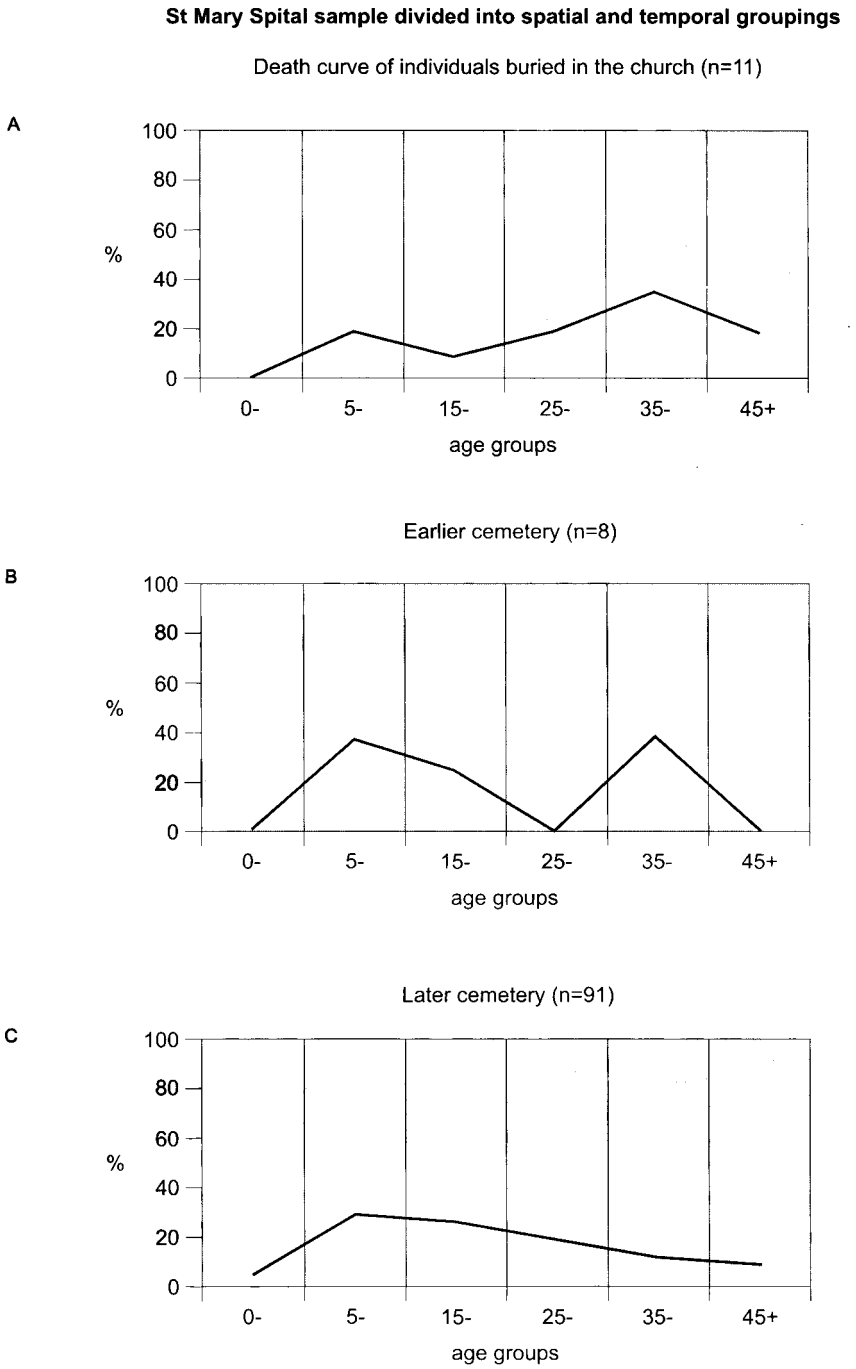

Fig 27.

male). Documentary evidence suggests that the higher ranks of the monastic inhabitants and wealthy lay patrons were accorded burial in this location (Thomas *et al* 1997 115–121). The remarkable shape of the curve for the early phase of the cemetery may well be a product of the small sample size, but it is of note that the hospital had a charter in this phase to care in

particular for women and children. The second peak was mainly composed of females. The later phase of the cemetery coincides with a massive increase in the size of the priory, which it has also been suggested may coincide with a change in the charter directing that the priory should care for all needy individuals. The peak of the third curve indicates that the majority of those dying were adolescents or young adults, an unusual occurrence in most societies under normal circumstances. Together with the fact that there was a preponderance of males in these groups, it has been suggested that this phase may reflect the many pilgrims or migrants who came into London (Conheeney 1997). They would have been particularly vulnerable to urban diseases on their initial exposure, and thus required the ministrations of the monastic hospital.

These case studies have illustrated that archaeological samples of human remains can generally provide evidence of the pattern of age at death present at a particular site, and hence a basis for conjecture about the environmental or cultural influences at play in that sample which could have produced such a pattern. Samples of this kind are known as attrition samples, where the cemetery population is composed basically of the vulnerable, those dying off, rather than a true cross-section of the living population. One possible exception to this, in the Museum of London archive, is the sample recovered from the Black Death burials of 1349 at the Royal Mint site (see Fig 1, **24**). This is a tremendously valuable skeletal collection, as it is unique in Britain and probably the world, since no other confirmed plague burials have been excavated to archaeological standards and retained for study (Grainger *et al* 1988; Hawkins 1990). Rather than the normal attrition sample, this collection represents a catastrophic event, where a large swathe of the population was killed off in a relatively short, definite time span under epidemic conditions. This may therefore be one case where the age at death of the burial sample may be expected to reflect the age composition of the living population of medieval London to some degree.

Fig 28 presents diagrammatic life curves for a wealthy industrialised country and a relatively poor country without access to modern medicine. The latter indicates a population made up of many young people with few surviving into old age. The former represents fewer young people, with a more gentle decline in numbers into old age. The third curve shows the age-at-death curve from the Royal Mint plague pit sample superimposed on the life curve for a pre-modern medicine society. The general trends of the two curves do appear to correspond. The only notable deviation is that fewer 15–25 year olds were present amongst the plague burials than might have been predicted from the proportion of the population this age group represented in the living population. There could be any number of explanations for this, ranging from problems with ageing skeletal material (although this age group is one of the more reliably recognised), through to the possibility that any correlation between the two curves is purely coincidental. It is very tempting to speculate that this is perhaps the most mobile age group; of sufficient maturity to move out of London and, in addition, still young enough to have relatively few ties to hold them there. However, the most likely explanation is that even in an epidemic situation, there is still a tendency for greater numbers of the old and very young to die rather than a truly random sample of the population (Platt 1997, 10, 15; Bolton 1980, 64). If it is accepted that the plague burials may be the nearest thing to a cross-section of the medieval population of London that could be hoped for, the sample is of enormous research potential.

INFORMATION FROM THE ANALYSIS OF MEDIEVAL SKELETAL MATERIAL

With the possible exception of the Royal Mint Black Death burials, this paper has demonstrated that the majority of samples from medieval London are best used to interpret activity at particular sites, and inferences based on this evidence concerning the entire medieval population of London should only be attempted with extreme caution. The database holding the collected information is expanding daily as new samples are worked on, or sites excavated. Hence, as more sites of different geographical, social or cultural types are included, it will become possible to provide some wider based conclusions. In the meantime osteological analysis can still make a very valuable contribution to the understanding of the archaeology of a site, such as in the following areas of research:

- An understanding of burial practices of the period.

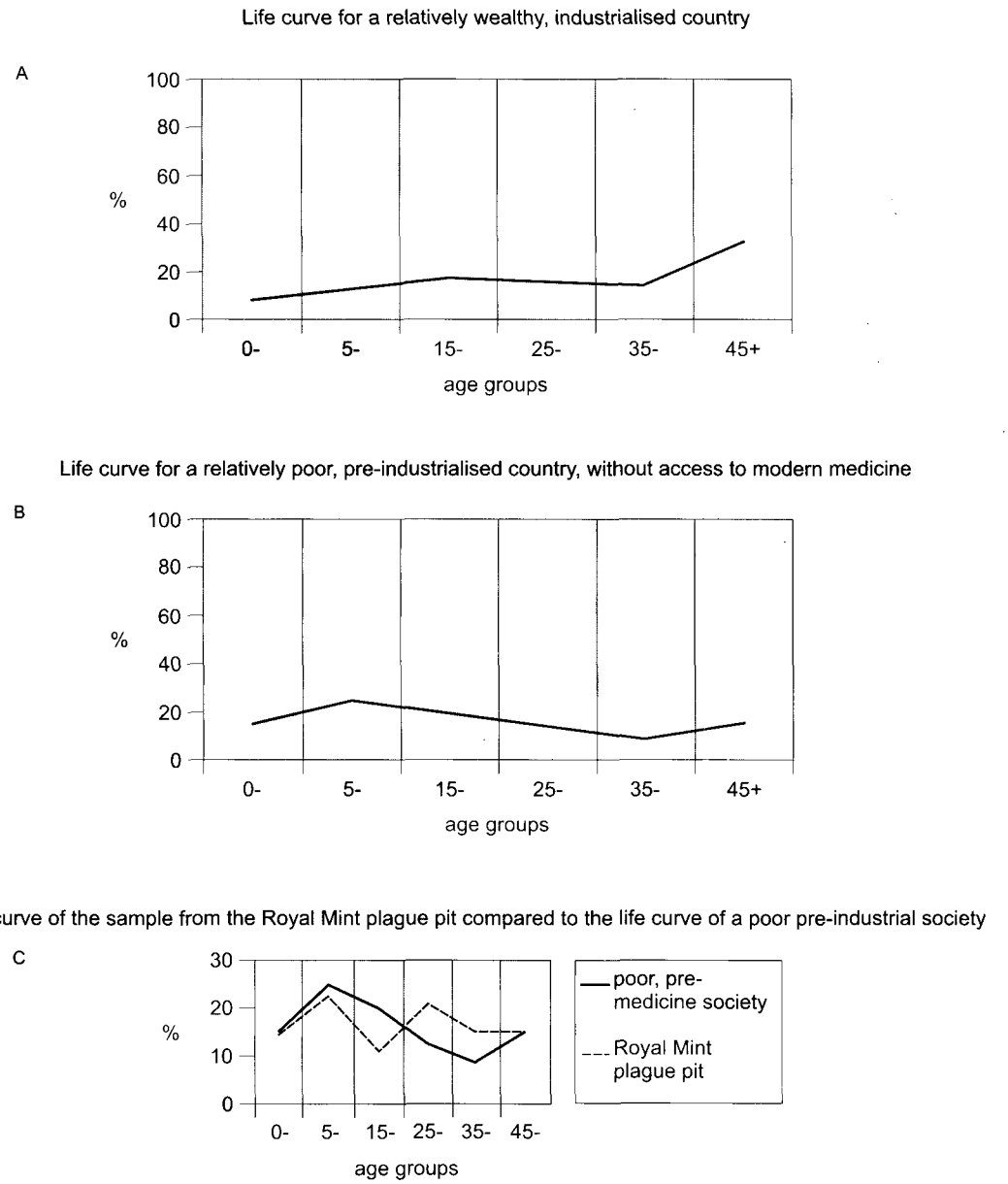

Fig 28.

- An insight into the customs or beliefs of the society that created the cemetery based on who was selected for burial in the cemetery and the form of any segregation present.
- Corroboration of the archaeologist's or historian's interpretation of the use of particular areas or phases of the site.
- The physique, and as such the physical appearance, of the burial population.
- The type of diet eaten and possible abundance and deficiencies.
- Differences in activities undertaken by different groups, and possible indications of division of labour.
- The effects of certain fashions on the skeleton.
- The level of personal hygiene generally practised by the individuals within a sample.
- Some of the diseases present at this time. As

remarked above, not all pathology is evident on the skeleton.
- Evidence for support of those with disabilities within society, which implies a certain degree of social cohesion.
- Indications of the level of violence within sectors of the society.

Examples of these points have been included in a variety of reports on medieval skeletal assemblages, held in the Museum of London archive, awaiting publication in many cases. Detailed discussion of each would overrun the space allocated for this paper. Instead, three of the most notable findings have been selected for expansion.

Attribution of status to individuals based on skeletal evidence is a controversial subject. Generally it is accepted that status cannot leave any skeletal indicators on the individual. While this is undoubtedly true, differences in status between different groups can perhaps be revealed by differences in several lines of evidence when they are considered together. For example, documentary sources indicated a difference in status between those buried inside the church and those outside at St Mary Spital (Thomas *et al* 1997, 123). Analysis of the two groups of skeletons showed differences in the patterns of skeletal and dental pathology, and differences in the achieved growth that appeared to corroborate this distinction (Conheeney 1997). Those buried within the church had less trauma of a general wear and tear nature and less pathology indicative of possible dietary deficiency than those outside. The former also had a greater prevalence of possible cases of a condition known as diffuse idiopathic skeletal hyperostosis (DISH), which it has been suggested could be associated with an affluent lifestyle. Those within the church had greater levels of severity of all categories of dental disease, except hypoplasia, than those outside, which may indicate that the former had access to a more affluent diet. The lesser degree of hypoplasia is interesting, as this condition reflects episodes of severe stress in childhood, which may result from serious illness, dietary deficiencies *etc*, possibly indicating that those outside were more exposed to such episodes. The individuals buried within the church were clustered at the higher end of the range of stature for the whole site, while those without were more scattered along the range. This could be significant, as attained height can reflect the adequacy of the available diet. These lines of evidence taken together, and

Table 1. Stature figures drawn from medieval London sites (in metres)

Site	Male average	Male range	Female average	Female range
St John Clerkenwell	1.73	1.59–1.87	1.58	1.50–1.74
Royal Mint church	1.72	1.50–1.80	1.62	1.55–1.70
Royal Mint later graves	1.67	1.50–1.80	1.60	1.50–1.70
Royal Mint plague pit	1.67	1.50–1.80	1.58	1.45–1.70
Holy Trinity Priory	1.73	1.62–1.85	1.64	1.54–1.76
Carter Lane Dominican Priory	1.73	1.60–1.82	1.56	1.49–1.63
St Mary Spital church	1.73	1.69–1.77	1.62	1.61–1.65
St Mary Spital early cemetery	1.71	1.71	1.59	1.50–1.63
St Mary Spital later cemetery	1.71	1.63–1.78	1.59	1.49–1.68

considered alongside the documentary evidence would appear to be clear osteological evidence of varying status.

Looking at the stature of the groups studied to date, an interesting trend is becoming apparent. Not only are those buried within churches attaining generally taller growth than those buried outside, but there also appears to be a greater difference in height between medieval men and women relative to the modern average heights of males and females. The figures in Table 1 illustrate this point. The nearest medieval average male height to the modern male average is only 1cm less; the furthest is 7cm less. However, the nearest medieval female average to the modern female average is 6cm less and the furthest is 10cm less. If this trend is borne out in further analyses, we could perhaps begin to infer differences in the social and environmental influences on men and women in the medieval population.

Finally, earlier observations on the increased prevalence of DISH in monastic populations, relative to non-monastic, (Waldron 1985) continue to be supported by evidence from each of the London monastic sites undergoing analysis. White, in another paper in this volume goes into more detail on this topic.

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This paper would not have been possible without the use of data collected by Barbara West, Deborah Downs, Fiona Keily, Bill White and Tony Waldron. With the exception of the published St Nicholas Shambles report by Bill White and the unpublished Carter Lane report by Fiona Keily, all the relevant reports are awaiting publication (timetabled over the next two years) in the Museum of London archive. The author wishes to acknowledge the contribution of Tony Waldron's Royal Mint report in particular. The reworking of his data is one of the key components of this paper and was believed to be necessary to raise the profile of this little known yet potentially, immensely important assemblage.

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