The medieval hospital of St Nicholas, Lewes, East Sussex

EXCAVATIONS 1994

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During the spring/summer of 1994 excavations were undertaken at the former site of the medieval hospital of St Nicholas, Lewes, East Sussex prior to redevelopment works. Two areas were excavated but little structural evidence for the hospital buildings was located. One area revealed part of the hospital cemetery and 103 burials were excavated. Also within this area were two large quarries thought to have been dug during a construction phase at the hospital, probably in the twelfth century. The second area contained yet another quarry, used for the disposal of large quantities of domestic refuse, particularly pottery, in the early thirteenth century. This area also contained the remains of a sill wall for a timber-framed building, which may have served the hospital.

INTRODUCTION

The hospital of St Nicholas, Lewes lay to the west of the medieval town, outside the circuit of the town wall in the parish of St Peter and St Mary Westout (Figs 1 and 2). The site is now a triangular plot of land bordered by Western Road to the south, Spital Road to the north and the A275 to the west (NGR TQ 405 101). The area is sited at approximately 48 m OD, on an Upper Chalk ridge, which slopes down to the north and south and continues west on to the South Downs (Lake *et al*. 1987). The site is marked on Victorian Ordnance Survey maps, although nothing of the hospital remained above ground by this time and a terrace of cottages occupied part of the area. St Anne's school was established on the site in 1909 and further school buildings were erected on the site of the terrace of cottages after their demolition.

After the school's closure, East Sussex County Council (ESCC) planned to adapt the site to become an urban resource centre. As the proposed building works would obviously impact upon any buried archaeological remains at this sensitive site, Archaeology South-East (a division of the Centre for Applied Archaeology, University College London) was commissioned by ESCC to undertake an archaeological evaluation of the areas to be disturbed by construction works.

This work, undertaken in 1993, established the presence of medieval and post-medieval deposits as well as a number of fragments of human bone (Machling 1993). Consequently, the two areas that were to be subjected to extensive groundworks were archaeologically excavated by Archaeology South-East between April and July 1994 (Fig. 1, areas A and B). The finds and archive of both the evaluation and subsequent full excavation are housed at Barbican House Museum, Lewes.

Although much is known of the function of medieval hospitals and their general plan is clear from surviving examples, very few have been subjected to archaeological excavation (Godfrey 1959; Prescott 1992). The principal room of the hospital was the infirmary hall, which was usually aisled and adjoined the chapel. The services and kitchens were housed in adjoining buildings that may have been set around a courtyard, and hospitals usually possessed a cemetery. It was hoped that the excavations would provide an insight into the position and layout of the main hospital buildings at the site, as well those of the associated ancillary structures. The hospital cemetery, if it could be located, might provide an assemblage of human remains with physical disabilities and diseases. Medieval populations are still poorly understood and a group from a hospital, because atypical, may be of particular interest for the study of human health and ageing.

Fig. 1. Site location map and trench location plan.

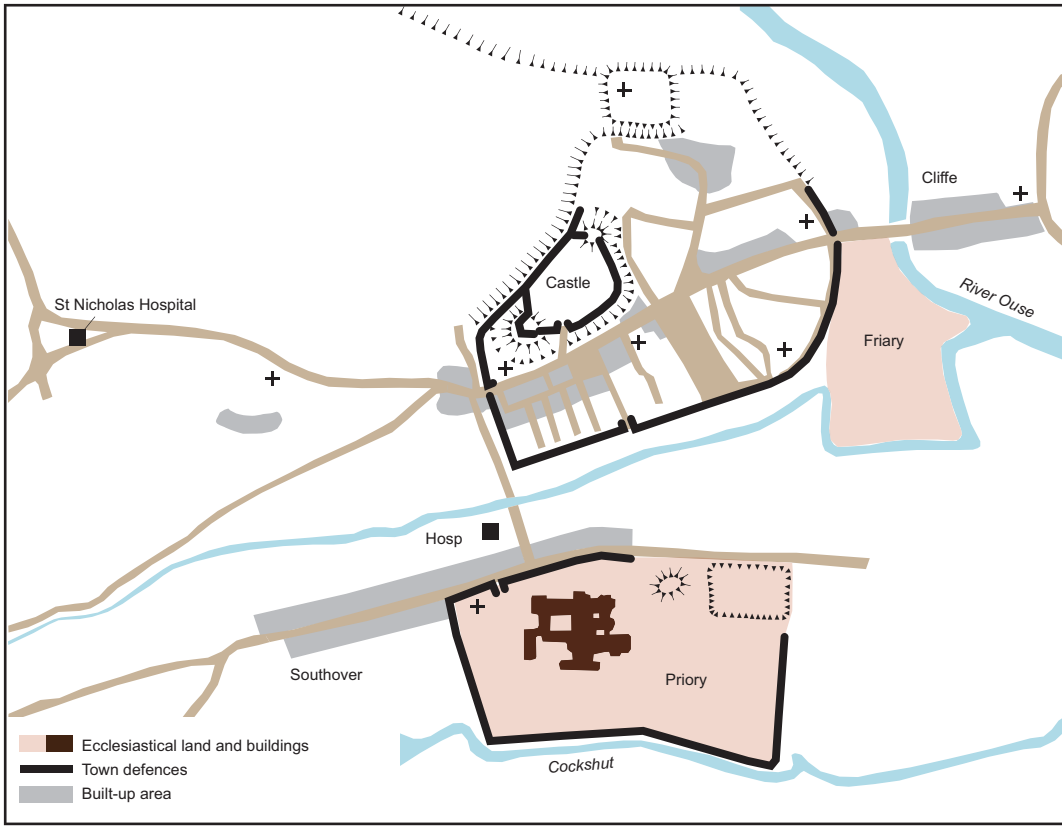

Fig. 2. Map of medieval Lewes (taken from Aldsworth & Freke 1976).

HISTORICAL SUMMARY
by Christopher Whittick

A full account of the site based on documentary, pictorial and cartographic sources is presented in the following article in this volume. However, a brief summary of the key points is included here in order to outline the context of the excavations.

There is little documentary evidence for the medieval history of the Hospital of St Nicholas. However, although the exact foundation date is not known, it seems probable that the de Warenne family founded the hospital as an infirmary for the poor, since it was endowed with rents from their demesne manors of Falmer and Swanborough, and was placed under the control of the prior of Lewes. The Priory also controlled the other hospital in Lewes, that of St James at Southover (Godfrey 1959). The first reference to the hospital of St Nicholas is from a contemporary account of the battle of Lewes, where it is described as a leper-house. Leper hospitals in the patronage of monastic houses were often short-lived, and all but one of the later sources refer to the poor people of the hospital. It can only be concluded that, although serving as a leper hospital for some of its life, the establishment was primarily concerned with the generally infirm of the area. It is known that many non-leper hospitals began to take lepers into their care in the later thirteenth century (Prescott 1992, 5). Illustrations of the site from the second half of the eighteenth century (see Whittick this volume, Figs 1 and 2) show cottages grouped by a masonry gable wall of apparent twelfth-century construction. These are the only representations of the medieval hospital buildings which have been located.

At the time of the dissolution there were 13 inmates, and after 1547 the site is often referred to as an almshouse. Certainly by this time, if not

before (as the archaeological evidence suggests), both men and women were in residence. After the Reformation until 1810 the whole site remained an almshouse or poorhouse repaired and administered by St Anne's parish, though before 1810 the north-west corner, now The Windmill pub and three cottages, had been sold off (ESRO AMS 5809).

Early seventeenth-century maps show a row of cottages on excavated Area A. Spital Houses or Cottages appear to have continued in use, though with substantial remodelling in the late eighteenth century, into the early part of the twentieth century, but were demolished between 1933 and 1938. Most of the site to the west of Spital Cottages was purchased in 1909 by Lewes Borough Council for the site of St Anne's School. As a result of the 1944 *Education Act* the land came into the ownership of East Sussex County Council, which subsequently purchased the Spital Cottages site for an additional school classroom/dining block.

On 23 July 1770 the *Sussex Weekly Advertiser* reported that 'numbers of bones and skulls' had been dug up at the Spital by workmen digging the Lewes–Brighton turnpike, now Western Road, which abuts the southern boundary of the site as a cutting. The same event seems to be reported 25 years later, when it was recorded that most of the slain after the Battle of Lewes were interred in the field or croft adjoining the hospital, and 'a few years ago', as they were making the new turnpike road from Lewes to Brighton through St Anne's parish, the workmen dug into one of those pits and threw up a great quantity of human bones (Dunvan 1795, 369). Further bones seem to have been found in 1810, when three pits filled with skeletons were discovered at Spital Crossroads (the gaol was not built until the 1850s) while lowering the Brighton turnpike. 'Each pit was estimated to hold quite five hundred bodies, and carts took several days to move them to the grounds of Saint Anne's poor houses where they were re-buried.' (Carpenter 1987, 28–9).

EXCAVATION RESULTS

The following text is an abridged version of the original report; the full version of all specialist reports can be found in the ADS supplement. In the text and illustrations that follow, numbers associated with artefact illustrations are consistent with those allocated in the specialist report catalogues.

THE PRE-MEDIEVAL DEPOSITS

The only pre-medieval deposits on the site were located in Area B, where the natural chalk sloped down moderately toward the south. The earliest deposits consisted of two thin layers of colluvium covering the southwestern corner of the trench ([22] above [42] not illustrated). These deposits thickened as they ran southwards but produced no pottery, but [42] produced a single Iron Age coin (an Atrebatic inscribed 'E' type silver Unit attributed to Commius, *c.* 45–30 BC). A natural gully [39] was located in the southeast corner cut by the quarry to the north (see below & Fig. 3).

THE MEDIEVAL QUARRIES

Area A

Two large chalk quarries were located in the northern half of Area A (Fig. 4). Although both were excavated down to the base of the lowest burial horizon, due to their size, the lower deposits could only be sampled by excavation. Due to health and safety considerations neither quarry was fully bottomed. To the east, the quarry [443] extended outside the eastern edge of the trench. It had stepped vertical sides with a steep slope at the base of the vertical edge (Fig. 5, S3). Of all the chalk rubble fills only [441] produced two pottery sherds of eleventh- to twelfth-century date. A few smaller chalk pieces in [440] showed signs of having been burnt.

To the west was a further deep pit cut into the chalk [430] (Fig. 5, S2). This may reflect an extension to the partially backfilled quarry [443] or may represent a totally separate quarry cut. Within this cut was a tunnel-like gallery driven westwards into the vertical face of the quarry [425] (Fig. 5, S1). Due to safety considerations the gallery was not fully investigated and its length remains unascertained. However, judging from its position and orientation it would undoubtedly have emerged in quarry [75] to the west. The section of gallery examined showed signs of sooting on its roof and within its chalk-rich fill [426] there was a noticeable quantity of charcoal pieces (<50 mm). It is possible the charcoal was originally from timber props to support the roof of the gallery, which were subsequently burnt out in order to collapse the chalk above and thus facilitate its removal. However, the precise function of this gallery must remain uncertain and its presence does not prove whether quarries [75] and [443]/[430] were in contemporary usage or not. Sealing the gallery

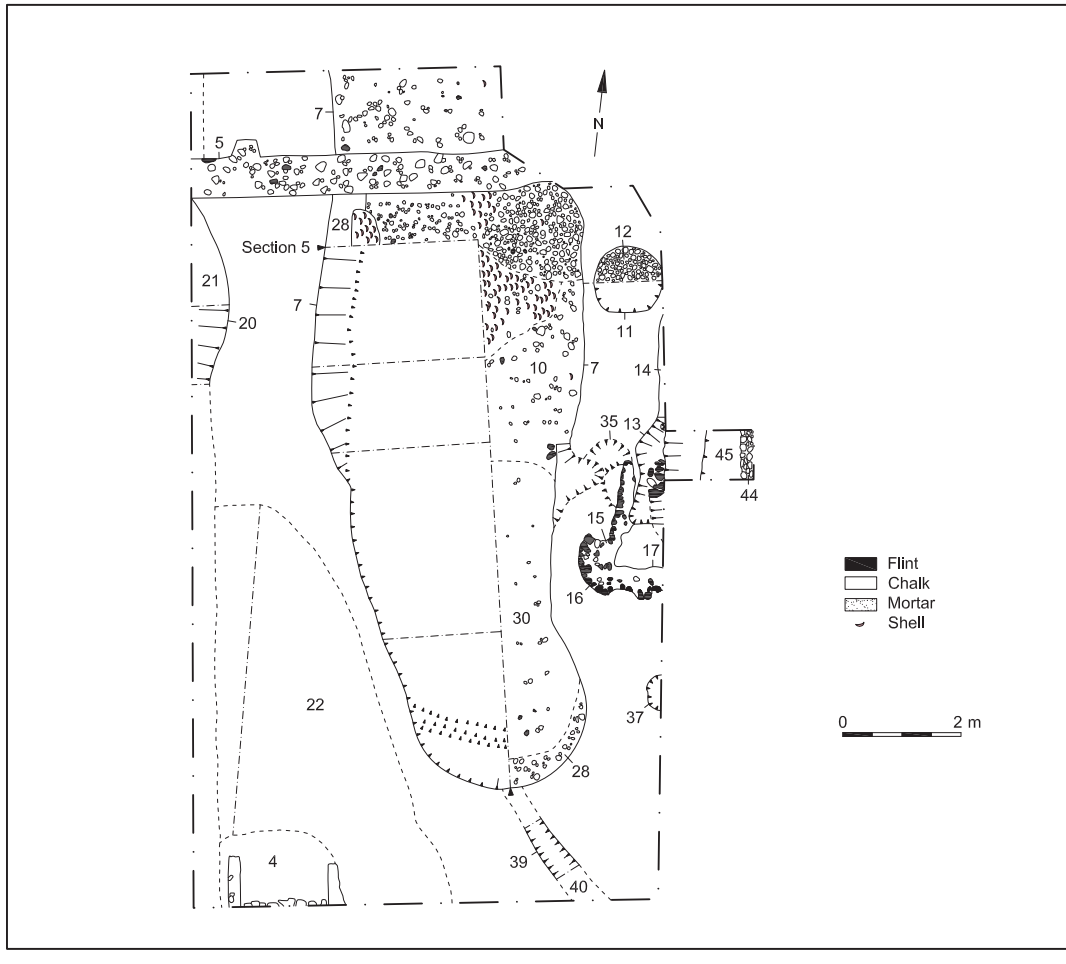

Fig. 3. Plan, Area B.

were two undated chalk rubble fills [432] and [431] (Fig. 5, S2).

Above this there appeared to be a further cut [433] into the earlier quarry. Two chalk rubble fills were associated with this: [434] and [435], [434] also containing some burnt chalk. The pottery from these fills suggests a slight chronological progression but both have been dated to the twelfth to thirteenth century.

The western quarry [75]/[418] (Fig. 4) was excavated below the burial horizon (see below) at its western and eastern ends. As correlation of the quarry fills between the two ends proved impossible with certainty, different context numbers were used in each area (Figs 5, S1 and 6, S4). The overall plan of Quarry [75]/[418] was oval with steep sloping sides. A series of steps cut into the chalk descended into its western end.

Fill [400] (Fig. 6) showed signs of trampling on its upper surface but contained no datable material. Eleven sherds of probable twelfth-century pottery were located in the fill above [397]. Fills [399], [398], [396] and [395] represent continued infilling of the quarry with unwanted quarry waste, and were all sealed by a dense deposit of larger chalk pieces, perhaps representing unused chalk from wall construction on the site [394]. This context also produced a few sherds of twelfth-century pottery. The uppermost fill [392] had been slightly disturbed by grave-digging and produced intrusive pottery dating as late as the seventeenth century.

The eastern end of the quarry [418] (Figs 4 and

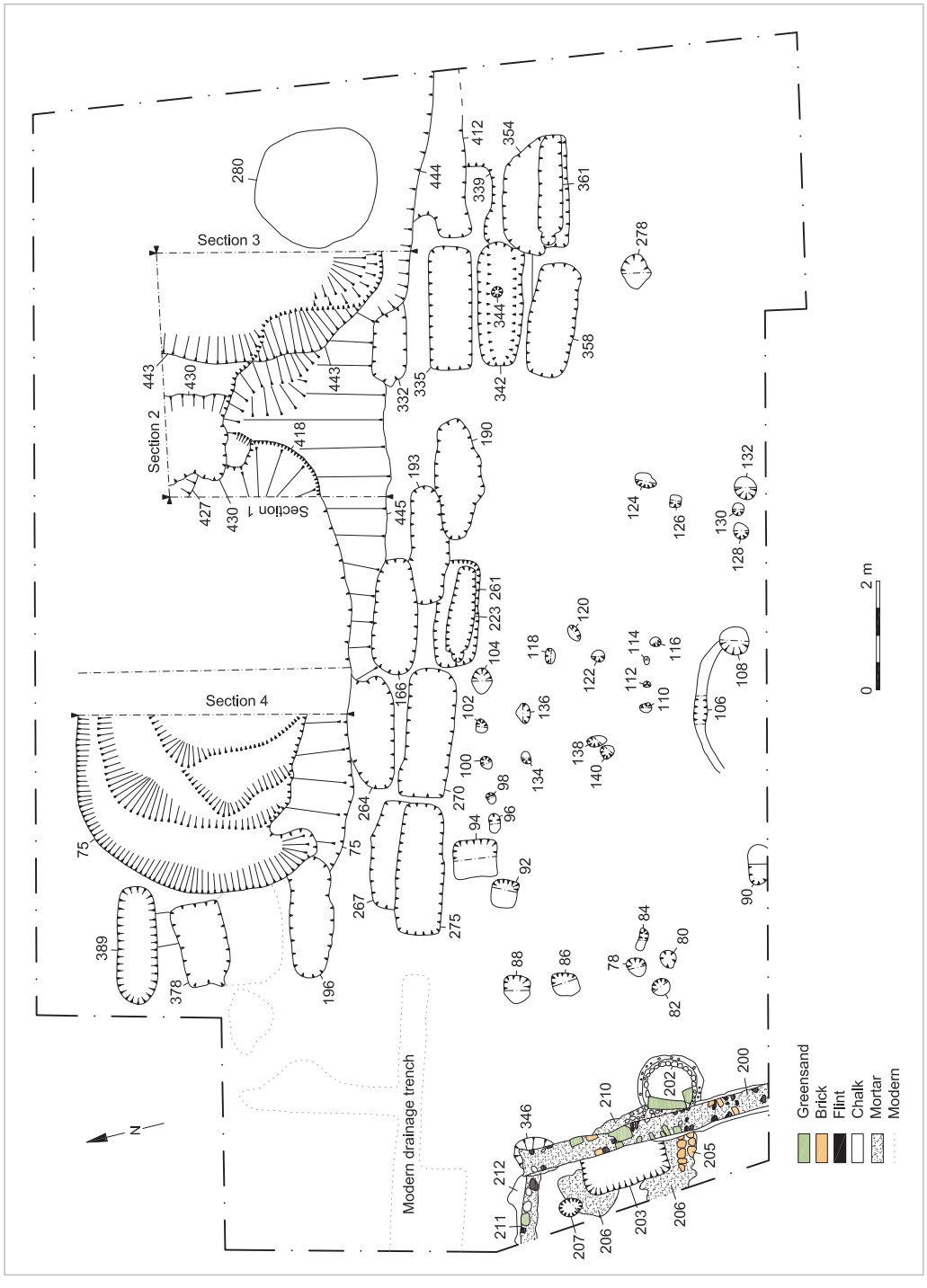

Fig. 4. Plan, Area A.

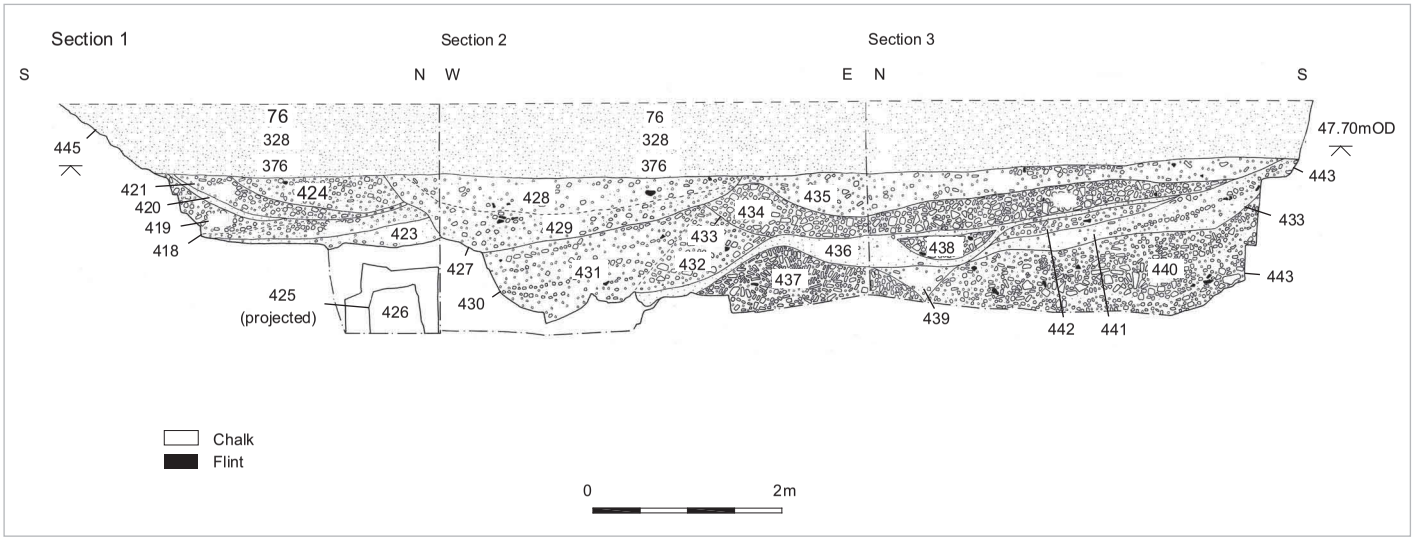

Fig 5. Sections, Quarry 418, 430, 443.

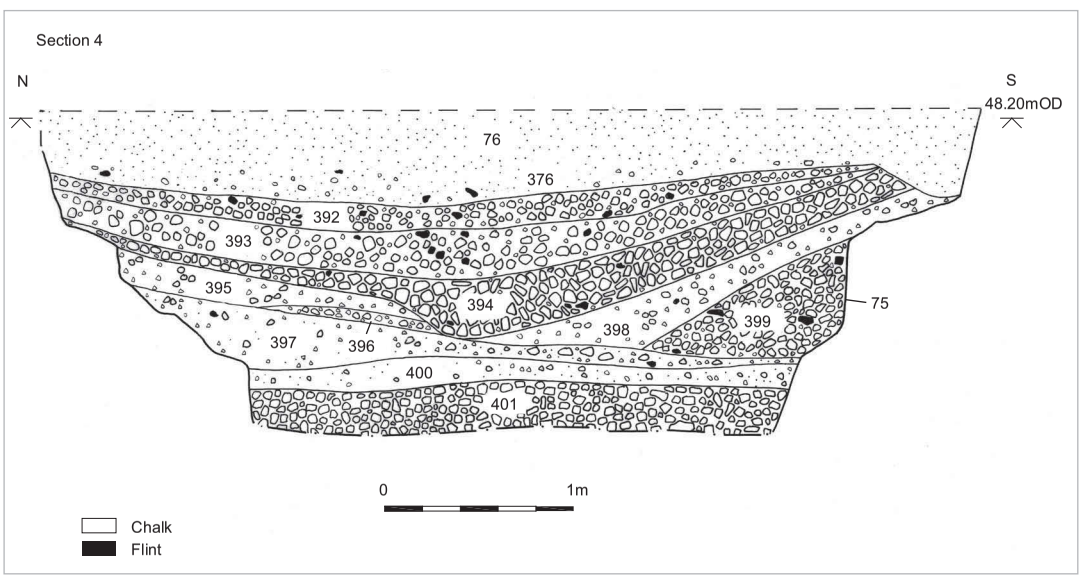

Fig. 6. Section quarry 75.

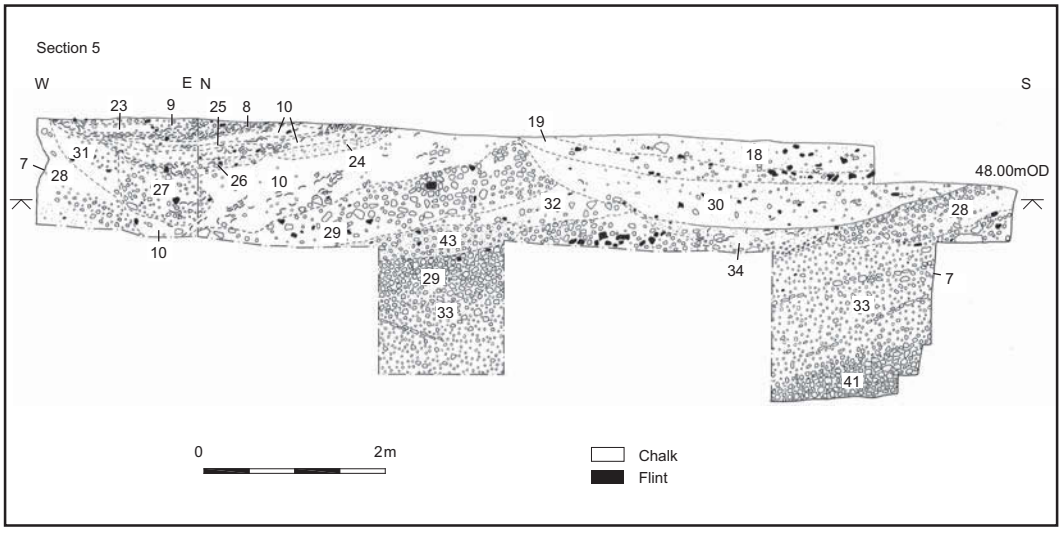

Fig. 7. Sections, Quarry 7.

5, S1) contained a sequence of undatable chalk rubble fills similar to those at the western end [75]. It is impossible to be certain which of the two quarries [75] and [443] was cut and backfilled first. The ceramic evidence suggests that [443] may be earlier, but too little material is present to draw firm conclusions. It is quite possible that both were infilled at the same time, although one is more likely to have been used as a depository for waste from the other.

Following the infilling of both quarries, a further cut was made at their junction [427] (Figs 4 and 5, S2). Its function is uncertain, and its full extent could not be ascertained as it ran outside the trench to the north. Its undated fills were similar to those of the quarries.

The southern edge of both quarries [75] and [443] had been eroded to form a steeply sloping weathered face [445] (Fig. 4). The quarries, which up until now had been partially filled with quarry waste, were finally filled to the level of the surrounding undisturbed chalk, with a grey-brown silt clay with notably less chalk rubble. This material was excavated as three spits ([76], [328] and [376], Figs 5 and 6), all representing the same stratigraphic unit and containing all the burials located within the quarries. Some post-medieval and modern disturbance was also encountered in this burial deposit.

Area B (Fig. 3)

The dominant feature in Area B was a large quarry [7] cut 2.8 m into the natural chalk and extending outside the limits of the trench to the north. The visible part of the quarry consisted of a relatively narrow north–south orientated cut, which broadened toward the north. The sides were vertical or near vertical in most places, although some steps in the chalk were noted at the southern end of the pit (Fig. 7). The faces of the exposed chalk sides of the quarry were very irregular and it was obvious where chalk blocks had been removed in relation to the natural bedding and jointing of the rock. Easy access was not possible into the quarry within the excavation area and it is likely the original access was from the unexposed northern end. Due to the depth of the quarry and the unstable nature of its fills, it was only possible to reach the base of the quarry in two test-pits.

Its primary fill [41] consisted of an intermittent deposit composed of 50% loose chalk rubble. Above was fill [33] composed of 40% loose chalk rubble and containing visible tip lines (Fig. 7). It is probable that [28], a finer deposit around the quarry edge, represents a period of natural weathering after the initial partial backfilling of the quarry. A few sherds of late twelfth- or early thirteenth-century pottery were recovered from [28] and [33].

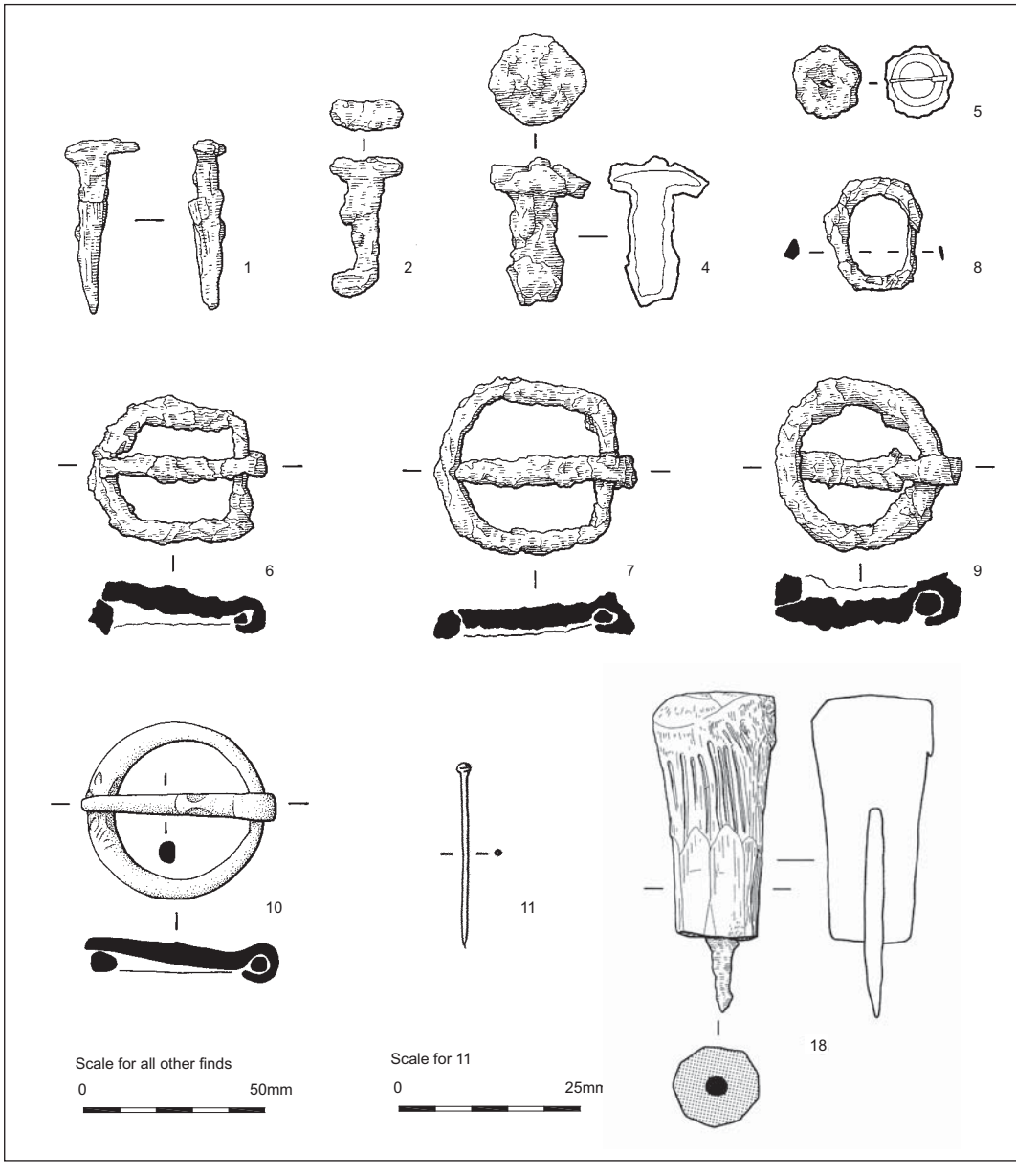

Fig. 8. Coffin nails, dress accessories, antler-handled bradawl.

Above this, [29] was also chalk-rich (40%) but contained pottery in reasonable quantities, suggesting the start of refuse disposal into the pit. Within [29] were two further deposits [43] and [32]. The nature of [32], along with the presence of large quantities of pottery, suggests that it represents a dump of kitchen refuse into the quarry as [29] was forming. The pottery suggests that [29], [32] and [43] were deposited at the same time. This group is likely to span the late twelfth or early thirteenth century and is similar in make-up to those stratigraphically above.

After the deposition of [29] the quarry was filled with two separate sequences of deposits, although

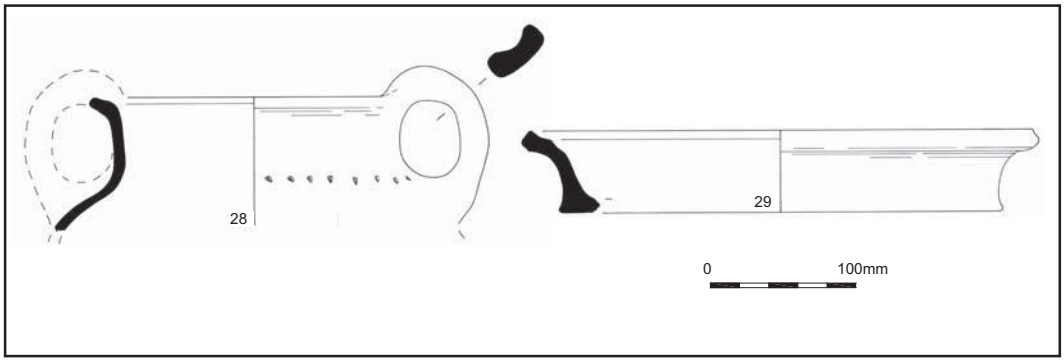

Fig. 9. Pottery, contexts 29, 32 (Cat. no. 28, 29).

the pottery suggests that both were laid down at a similar date. Towards the north was a thick midden deposit [10] containing large quantities of pottery, shell and other food refuse. The lower part of this context consisted almost entirely of late twelfth- to early thirteenth-century pottery and sometimes lacked any soil matrix between the sherds. Within [10] were distinct but contemporary chalky deposits [27] and [31], both likely to represent either a further dumping of quarry waste or natural erosion of the quarry edge.

Distinct thin tip-lines were also present within [10], although they are all thought to be of the same general deposition event, and this is borne out by the ceramic evidence. The lowest consisted of an off-white loose sandy mortar [24] and two dense concentrations of oyster shells [26], [25]. Above was [8], similar to [10] but differentiated from it by the presence of large quantities of oyster and mussel shells. Deposits [8] and [10] produced a similar pottery assemblage, and conjoining sherds between the two deposits indicate that they were deposited together.

The southerly sequence of fills in the quarry began with dished deposit [34]. Its consistency varied considerably, but in many places it took the form of a hard concretion in which the soil inexplicably adhered firmly to any artefacts within it. The presence of large quantities of pottery, oyster shell and some eggshell fragments would suggest that it was not derived from cess material. It is possible, therefore, that the concretion was due to fats from kitchen refuse. The general similarities in fabric and form would suggest [10] and [34] were probably deposited at a similar date.

The final fill of the quarry was [30]. This context produced another similar assemblage to [34], although better quality sandy jugs appear more common, suggesting a slightly later date. This suggestion is supported by the associated metalwork including copper-alloy dress accessories, an antler-handled bradawl (Fig. 8:18) and a silver Penny of Edward I, II or III, *c.* 1279–1335, indicating a later thirteenth-century date. However, the presence of some transitional sherds, along with its stratigraphic position in relationship to post-medieval [19] makes the degree of intrusive material difficult to ascertain. A mid thirteenth- to early fourteenth-century deposition date is likely.

Domestic refuse deposits

Perhaps the kitchen waste deposits in Quarry [7] provide the best insight into life at the hospital. The earliest suggestion of deliberate refuse disposal comes from [29] and [32] (Fig. 7), containing large quantities of pot. Where discernible this is mainly from plain cooking pots, although handled cooking pots, shallow bowls and skillets are also present (Fig. 9:28–9). Most other sherds in this combined assemblage appear to be from jugs.

Later deposit [10] produced the largest group of pottery from the site, providing a late twelfth- to early thirteenth-century date. The assemblage consisted mostly of undecorated cooking pots with either plain or flanged out-turned rims (Fig. 10:3 & 6). The limited decoration normally consists of 'pie-crust' rims, simple finger-impressions on the rim or around the shoulder (Fig. 10:5, 6, 13). Similar vessels have been noted at Lewes Castle (Gardiner 1992). Further cooking pots have simple flaring rims of twelfth-century type (Fig. 10:9) but more developed rims are also present (Fig. 10:8 &

Fig. 10. Pottery, context 10 (Cat. no. 3, 5, 6, 8, 9, 12, 13, 14, 16, 17, 18, 20, 46).

12). Decoration on these is rare and similar to that described above, although applied thumbed strips are also present.

Although not in large quantities, handled cooking pots/storage vessels and skillets are represented, as well as a single curfew (Fig. 10:14, 16, 17, 46). Jugs are rare, but both unglazed and glazed examples are present (Fig. 10:18 & 20). The source of some of these is likely to be the Ringmer and Rye kilns.

Deposit [34] produced another large assemblage in similar fabrics to those from [10], dominated by cooking pots. Although the rim forms of these are similar to those from [10], wide-flaring rims are more common and some of these are of 'pie-crust' type. Shallow bowls, some of which may be undiagnostic skillets sherds, are present, but jugs are rare. Two sherds of Saintonge-type ware are present, along with a little intrusive transitional pottery.

In addition to the pottery, [10] also produced the largest quantities of food refuse from the hospital. Analysis of the animal bone suggests that cattle were the main meat provider but that sheep/goat and pig all played an important part. Approximately 82% of the animal bone display butchery marks associated with general food preparation. The representation of all parts of the cattle, sheep/goat and pig skeleton suggests that entire carcasses were butchered at or close to the hospital. Butchery marks present on horse and fallow deer bones suggest that these too were a food source. Fowl, including geese, were also present.

This diet seems to have been supplemented by fish, with [10] producing approximately 500 grams. With the exception of eel, all species identified (including cod, haddock, gurnard, grey mullet and herring) are marine species. Although many could have been caught locally, the hospital seems to have benefited from the extensive medieval trade networks. Oyster and mussel shells were also found in large quantities. They were most abundant in [8] and [10], which contained approximately 15 kg and 16 kg of oyster and 700 g and 1.8 kg of mussel shell respectively. Approximately 6 kg of oyster shell were also produced by both contexts [30] and [32].

OTHER MEDIEVAL FEATURES

Protruding from the eastern trench edge in Area B was a circular twelfth-century post-hole with almost vertical sides [37]. Due to limited space, the full depth of this feature could not be ascertained although it was in excess of 700 mm.

To the north was a small circular late thirteenth-century pit [11]. At the eastern edge of the quarry was an irregular, shallow scoop cut into the chalk [35]. The fill contained pottery of a similar date to that from the quarry and additionally two fifteenth- to early sixteenth-century sherds. Whether these are indicative of the true date of this feature or are intrusive from post-medieval layers [18]/[19] above is uncertain. The relationship of scoop [35] to wall [15] (see below) could not be established with any certainty.

THE HOSPITAL BUILDINGS

The sparse evidence for the hospital buildings themselves consists of both structural remains and associated artefacts.

Protruding from the eastern edge of Area B was the southwest corner of a masonry structure consisting of two walls [15] and [17] strengthened by a curving corner buttress [16] (Fig. 3). All were constructed of flint nodules set in a dull yellow fine sandy lime mortar. None of these walls had associated foundation trenches, but this is not surprising considering the solid geology beneath. Their narrow width suggests they were probably sill walls for a timber-framed structure. Wall [15] effectively faced a slight terrace cut in the chalk with a single thickness of roughly faced flint nodules, presumably to limit the weathering of the chalk and thus undermining of the building. At the top of the wall mortar had been spread across the flint on to the natural chalk, making the wall look much thicker in plan than it actually was. This would undoubtedly have helped to key the flint to the terrace face. As it ran down-slope it increased from one course of flint at the northern end of the wall to three courses at its junction with [17]. This compensated for the natural slope, creating a level upper surface for the building's timber soleplate. Although the wall appeared to have been removed to the north, it is probable this was not the case, with the soleplate resting directly on the natural chalk north of this point.

Wall [17] was similar to [15] in both construction and dimensions. It consisted of a single thickness of roughly faced flint nodules revetting the chalk terrace on its southern side. Three courses of flint were present, and the upper surface was on a

level with that of [15]. Mortar had been spread northward across the natural chalk in a similar fashion to [15]. The buttress [16] tapered slightly in elevation. It was constructed with a flint and chalk core with coursed roughly faced flint surfaces, some of which still showed traces of a mortar rendering. The buttress and both walls appeared to have been built contemporaneously.

Within the area of this building was the edge of a steep-sided cut [13]. The upper fill [14] produced a few sherds of seventeenth-century pottery, but it is possible this deposit had slumped into the cut at a later date. It is probable that this feature may be a cellar or undercroft associated with the building represented by [15] and [17]. Whatever the case, this area lay outside the area of development and survives *in situ* at the site.

In Area A, to the east of [202] and south of the chalk-cut graves, was an area containing some post-medieval post-holes and pits possibly associated with the early post-medieval almshouses, but devoid of medieval features, which had been the site of the terrace of cottages. The lack of medieval features in this area, along with the apparent respect of this area by the graves, suggests that a medieval building had stood on this spot. The lack of evidence for such a building is not surprising, considering the disturbance caused to this area by the Spital cottages, as well as the fact that the chalk negated the need for substantial foundations.

Excluding chalk and flint, the two most common stone types at the site are Upper and Lower Greensand/Horsham Stone. Most occur as irregular undiagnostic broken pieces, but six fragments of Upper Greensand have worked faces, frequently showing diagonal tooling. Although the worked fragments are small, ashlar blocks and window mullions appear to be present. These fragments strongly suggest that the other irregular examples are also from architectural elements and that Upper Greensand was brought to the site specifically for this purpose, almost certainly from outcrops at Eastbourne. This stone type, which is relatively easy to shape, would have been used for cornerstones and window and door openings. Most of the diagnostic worked material is from medieval contexts, in particular the quarry in Area B.

The Lower Greensand/Horsham Stone from the site is present in five variants, presumably representing different outcrops. The majority of the fragments are split along their bedding plains, resulting in thickness varying between 6 and 11 mm. All these types are undoubtedly fragments from stone roofing slates, and indeed a few examples still have circular fixing holes surviving. No complete dimensions are present. These roofing slates were located in medieval deposits in both areas of the site, although the majority were from the quarry in Area B. West Country slate was also recovered, but the relatively small quantities suggest it was not the primary roofing material. The presence of ceramic peg tiles in [30] provides evidence of another material in use.

The end and corner of a chalk ashlar block were located in [32] (Area B). One complete dimension is present (200 mm), as well as the remains of a probable tapering lewis hole (maximum diameter 40 mm) for lifting the block. The presence of this piece is important in that it demonstrates that the quarries were being excavated to provide chalk blocks for internal construction rather than just providing chalk for lime-burning. This would also explain the huge quantities of small chalk rubble in their in-fills.

Fragments of at least six chimney pots were recovered, virtually all from the fills of quarry [7] (Fills [8], [10] and [27]). All pieces come from 'Sussex type' chimneys and are similar to pots found previously in Lewes (Dunning 1961; Gardiner 1992). The reason why so many chimney pots should be incorporated into these deposits is unclear, but they may represent damaged materials left over from construction activity, disposed of at a later date (Fig. 11:1–6).

Fragments of medieval glass were also recovered during the excavations. One small, badly degraded fragment of window glass was recovered from the grave fill associated with Skeleton [340]. In Area B, all the medieval glass fragments were from quarry [7]. The pieces are all badly degraded and vary in thickness between 3.0 and 3.6 mm. The presence of this material, although not in large quantities, suggests that at least some glazed windows were present within the hospital complex.

Discussion

The digging of the quarries appears to date to the ?early to mid twelfth century, with perhaps the quarry in Area B being dug later in the same century. Their marginal positions suggest they were sited to avoid the main building area. Chalk would have been extracted for the creation of

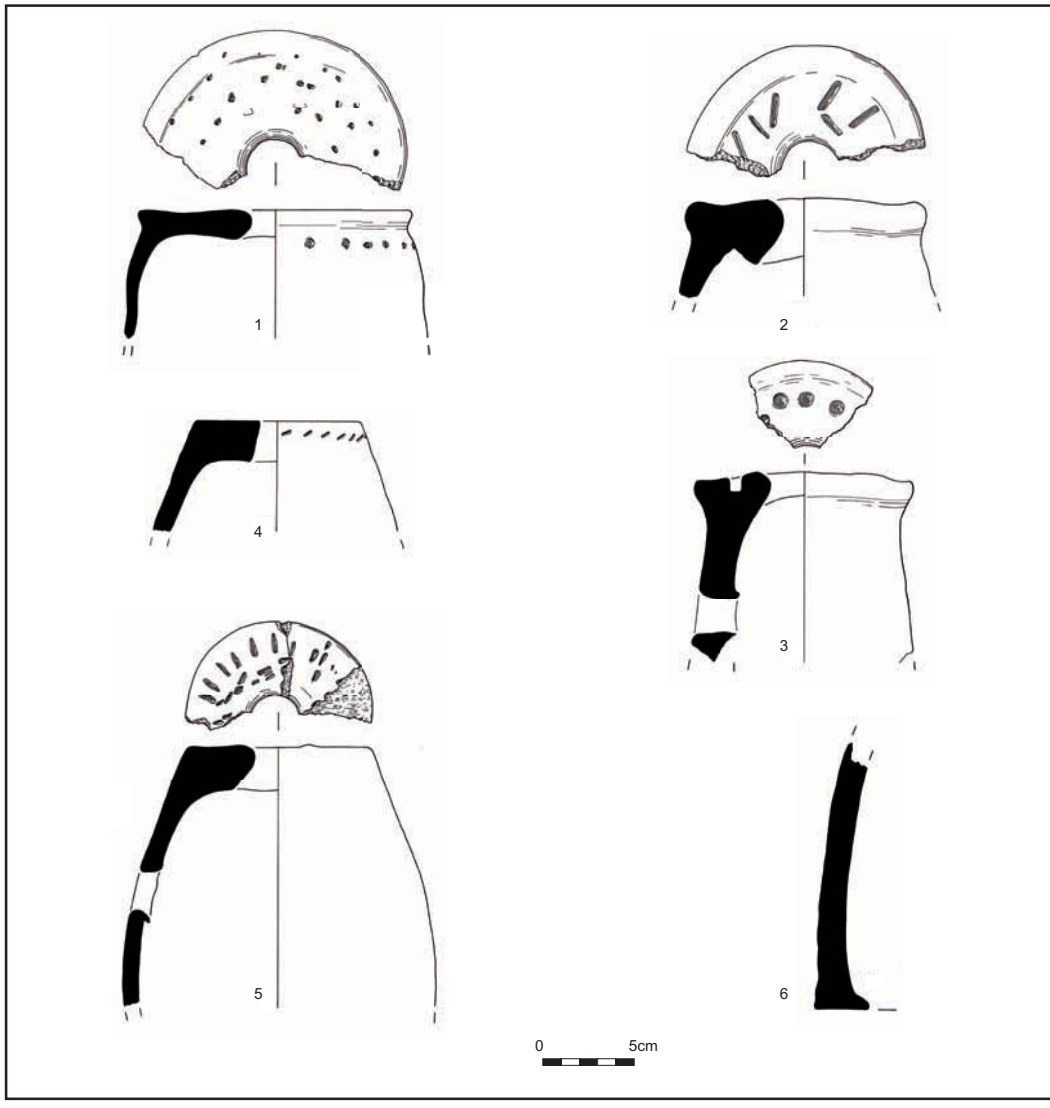

Fig. 11. Chimney pots.

lime mortar as well as building blocks for internal walling. The fact that the quarries were initially partly infilled with chalk-rubble shows that their primary purpose was not simply for the extraction of chalk for mortar production (or field dressing). The site therefore appears to have seen a major phase of construction during the twelfth century. Further evidence of this comes from the presence of a few fragments of Quarr stone from the Area B quarry and the eighteenth-century representations of a massive masonry gable wall of apparent twelfth-century build (Whittick, this volume; Figs 6 and 7). Although chalk and flint are likely to have constituted the main masonry elements of the buildings, the presence of dressed Greensand and Quarr stone indicates good finishing for at least doorways and windows, some of the latter being glazed. The illustrated gable wall suggests ashlar masonry, but this may be artistic licence.

A fairly standard plan for medieval hospitals would be a large infirmary hall with an attached chapel (Prescott 1992), often referred to as the nave

and chancel respectively. Ancillary buildings may then be grouped around an adjoining courtyard. The building located in Area B is assumed to be a timber-framed ancillary structure, perhaps the kitchen, but its extent and indeed its date are far from clear. The position of the southwest corner of the building suggests that the existence of the quarry was known. It therefore seems probable that the building was established at the edge of the partially infilled quarry due to restricted space at the site. The presence of pit [11] to the north suggests this building may have been of later thirteenth-century date, but the infill of the cellar/undercroft suggests that it had gone out of use by the sixteenth to seventeenth centuries.

The area devoid of graves in Area A is undoubtedly the site of a medieval hospital building. The location of Skeleton 444 to the south of Area A (Fig. 12) indicates that at this point the building could be no more than 6 m wide. The absence of medieval foundations probably results from their being built directly on to the surface of the natural chalk, combined with later robbing and ground disturbance relating to Spital cottages. The eighteenth-century illustrations of the site indicate what may have stood in this area, but interpretations drawn from these sources should be treated with caution. The appearance of the masonry gable wall in the illustrations suggests a building of some importance, perhaps the hospital chapel or infirmary hall (Whittick, this volume; Figs 6 and 7). This gable appears to have been located just to the west of Area A and formed part of an east-west orientated building (Fig. 1).

It is possible the gable wall formed the eastern end of the building. If so, it was most probably the infirmary hall, most of which would then be located below the main building of St Anne's School. An infirmary hall of up to 50 m long could fit within this area. This would also suggest that a courtyard for ancillary buildings, as in Area B, lay to the south. The chapel, probably to the east of the hall, would have occupied the area left free of graves in Area A, with the cemetery deliberately placed around this building.

Alternatively, the gable wall may have formed an internal division within a building as described above, but with hall and chapel forming two parts of the same building. This may be more typical of standard hospital layouts, but the windows depicted in the gable wall would suggest that the building to the east had a similar roof-line to the gable wall, or a very low one.

If the gable wall formed the western end of the building, the building within Area A may have been the hall itself, perhaps with a chapel on its eastern end. The southward step of burials may indicate where the chapel began (Fig. 4, Graves [342] and [358]), but if so the hall could not be more than 20 m long, shorter than most other hospitals of the period.

THE CEMETERY

Description, layout and development

The term 'burial' describes articulated complete and incomplete skeletal remains. In total 102 burials were located in Area A within and just south of the quarries (Figs 4 and 12). Subsequent building work uncovered one further burial (Skeleton [444]) to the south of Area A (Fig. 12). This part of the cemetery seems to have been in use from the late twelfth century until the early sixteenth century, with the majority of burials occurring during the first two centuries. All burials were orientated east–west in Christian tradition, as would be expected for a cemetery of this period. Eighty-two percent of burials were located in the quarry fills ([76], [328]), the remainder in chalk-cut graves to the south. These chalk graves, with one exception (Fig. 4, [389]), form the southern boundary of the burial area. In contrast to the shallow, ill-defined quarry-fill graves, the chalk-cut graves were clearly defined. Most were rectangular or sub-rectangular in shape, some 0.6–0.7 m deep, with vertical sides and flat bases (Fig. 13). In three graves: [223], [332], [361] the chalk had been cut into an anthropomorphic shape (Fig. 14).

The degree of intercutting between burials varied across the site, but the continual re-use of the central area of the quarry resulted in a large degree of intercutting and disturbance, particularly in the southeastern corner (Fig. 15).

The cemetery does not appear to have developed in any particular direction. The earliest burials include those in both chalk-cut and quarry-fill graves. Only the fifteenth- to sixteenth-century burials seem to be grouped together in the southeastern corner. Due to the uncertain degree of residuality and intrusiveness in the pottery assemblage brought about by grave-digging and later activity, it is virtually impossible to establish confidently either phasing patterns or dates for individual graves. The majority of the sherds are of

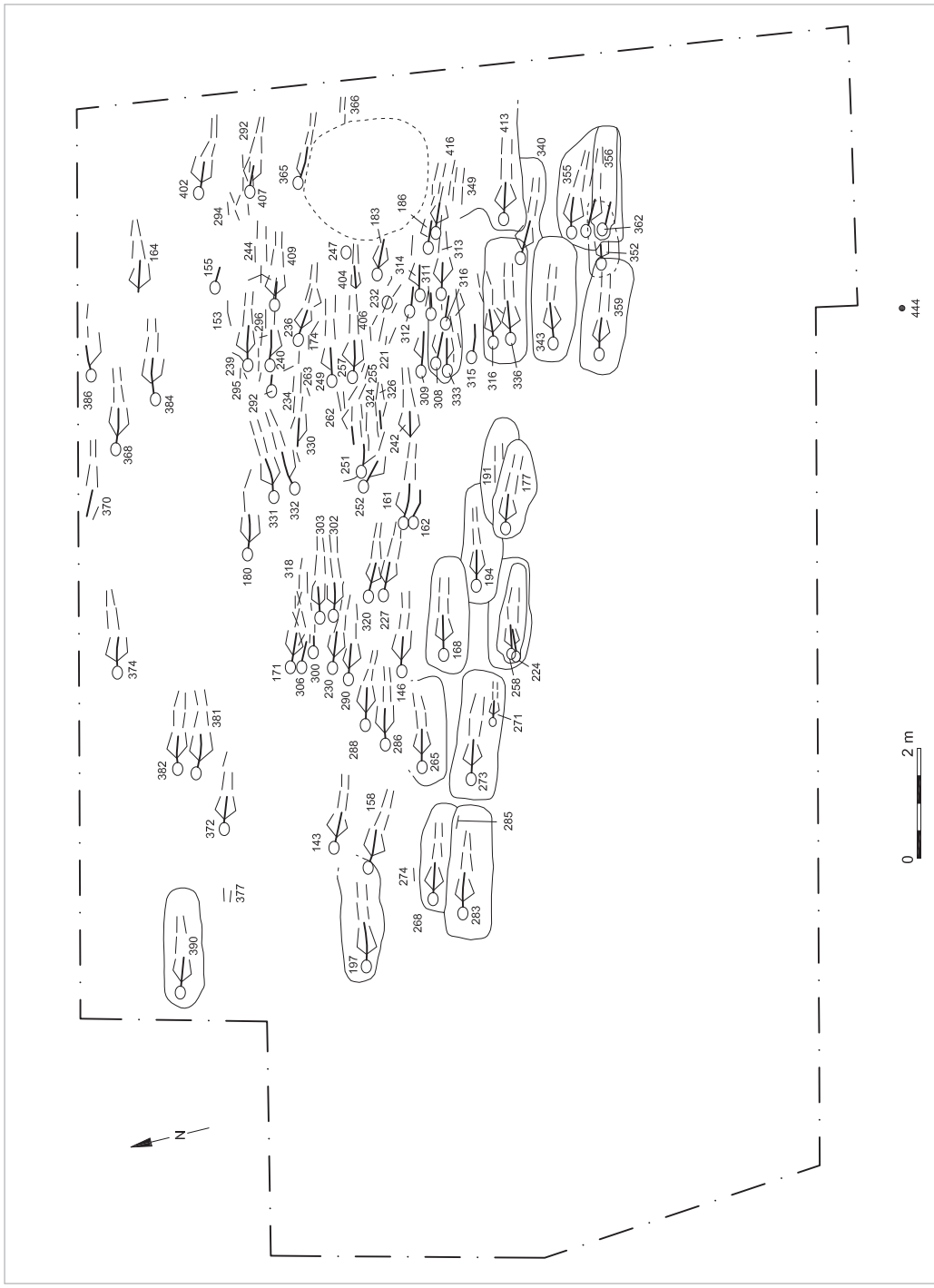

Fig. 12. Area A, Schematic plan of burials.

Fig. 13. Chalk-cut grave (Skeleton 168).

Fig. 14. Chalk-cut grave with anthropomorphic shape (Skeleton 224).

twelfth- to early thirteenth-century date, reflecting the fabrics located in the underlying quarry fills. Undoubtedly some of this material is from pre-cemetery deposits; however, the quantity present suggests that material was also being incorporated into this deposit during burial activity. Based on this assumption, the main period of burials is likely to have been in the later twelfth to thirteenth century.

Continued activity in the fourteenth and fifteenth centuries is suggested by further sherds, although they are far less numerous than the earlier material. This may reflect less burial in this area during this period or, more probably, the lack of pottery present as a general scatter in the vicinity. Some 16th-century sherds may relate to the latest burials on the site, but this cannot be ascertained. These sherds are more noticeable in the eastern part of the cemetery, particularly around Skeletons [183], [186] and maybe [355] and [356] (Fig. 12). However, some of these burials are in an area of later disturbance.

Of the discrete graves, six produced small quantities of pottery: Skeleton [197] (thirteenth century), [265] (early thirteenth century), [268] (early thirteenth century), [283] (mid thirteenth to mid fourteenth century), [362] (mid twelfth to mid thirteenth century) and [355]/[356] (thirteenth to fourteenth century).

Burial practice

Nineteen burials in both the chalk-cut and quarry-fill graves appear to have been interred in coffins (for example [168], [186], [194], [197], [283], [320], [359]) as suggested by the presence and position of nails and fittings. Insufficient dating evidence prevents an examination of coffin use in relation to burial phases, and coffins are randomly distributed throughout the cemetery. However, it was noted that the proportion of coffins in the chalk-cut graves is high compared to that in the quarry graves.

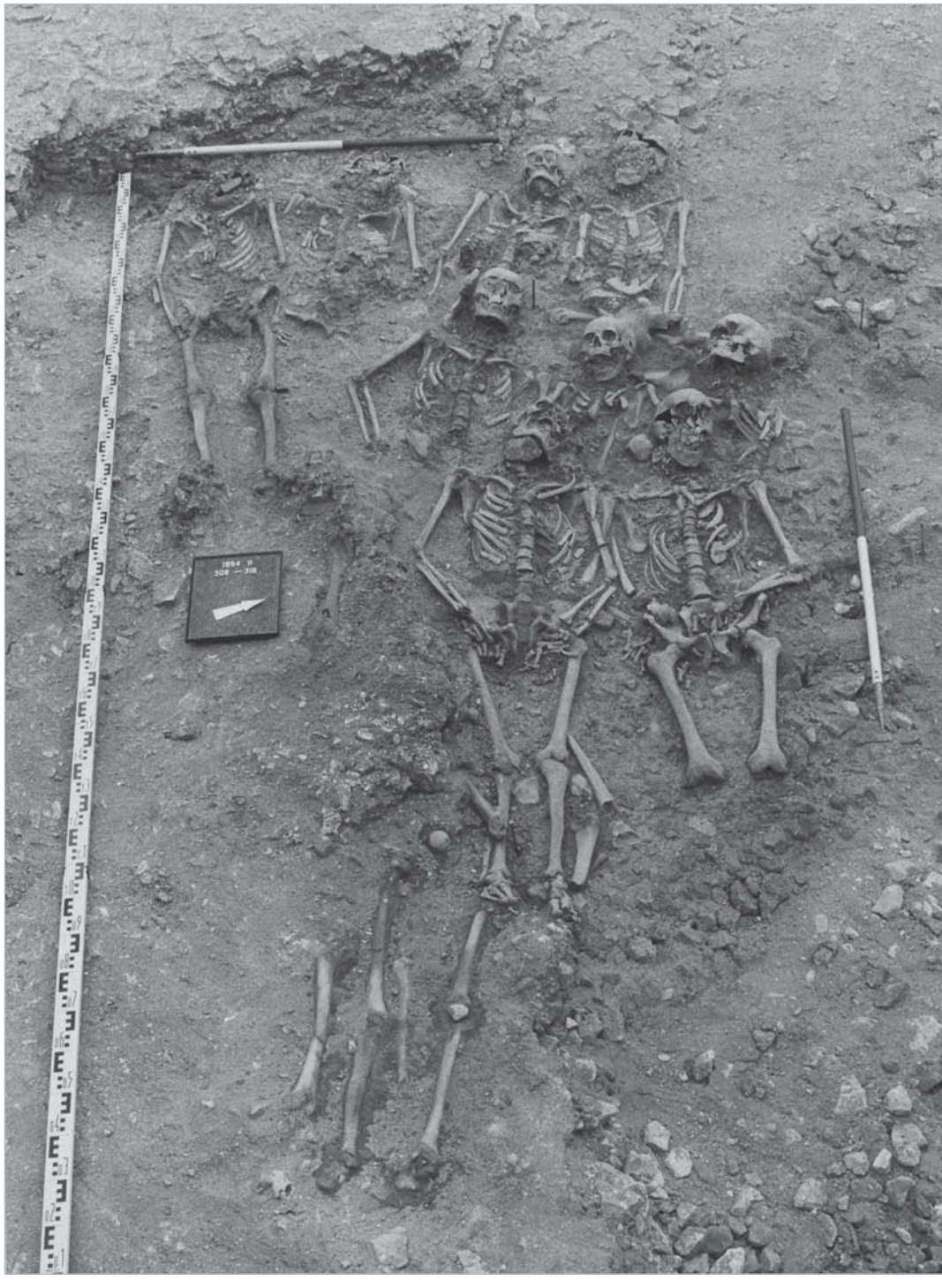

Fig. 15. Intercutting burials (Skeletons 308–16).

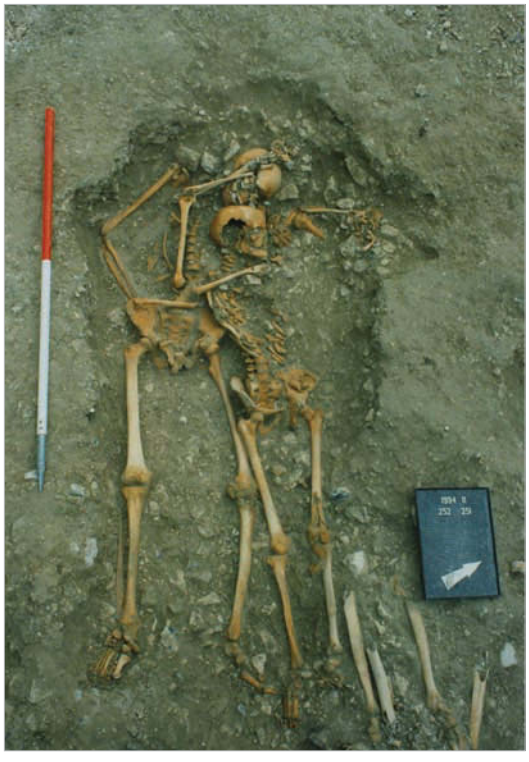

Fig. 16. Skeletons 251, 252.

No set pattern could be discerned from the positioning of nails, but their use in lid construction is suggested. The form of the coffin nails varies somewhat, but the majority have square or rectangular shanks 41mm-62mm long, and flat, elongated rectangular heads approximately 18 × 10 mm (Fig. 8:1–2). A number of these nails have traces of mineralized coffin wood still adhering. The other nail form definitely associated with coffin construction is a general type with a flat circular or slightly oval head (Fig. 8:4). These are far less numerous than the elongated rectangular headed type, and are of a general-purpose function. With the exception of a fragment of a possible small circular handle (Skeleton [186]) and a few small studded sheeting fragments, no other coffin furniture was recovered. This suggests that coffins were of a basic type.

It is likely that most of the hospital inmates were buried with shrouds only. Shroud pins were located from both graves associated with coffins (Skeleton [186], Fig. 8:11) and those without (e.g. Skeleton [340]). The position of the limbs in at least 18 individuals implies that they were not restricted by either a coffin or a shroud. In at least seven cases large chalk or stone supporting blocks were located on both sides of the individual's head (Fig. 13). At least four of these (Skeletons [168], [273], [336], [413]) are associated with coffins.

As would be expected for a Christian cemetery, the majority of the skeletons have been laid out in an extended supine position, with their arms crossed over the pelvis or by their side, but there are exceptions. Both skeletons [177] and [227] were buried with their arms and hands behind their backs. In addition, it would appear from their position in the ground that skeletons [251] and [252], buried together, were stood at the eastern end of the grave and allowed to fall backwards (Fig. 16).

Several double burials were present, occurring in both the chalk-cut graves, for example Skeletons [224] and [258], and the graves cut into the quarry fill, for example Skeletons [251] and [252]. The presence of more than one individual in a number of graves suggests the possibility of familial groups, or that more than one individual died at the same time from contagious disease. Although examined osteologically (see below), the skeletal population was too small for results on familial groupings to have been meaningful.

Metalwork or adornments associated with the burials are rare. Since it was a Christian cemetery associated with the poorer element of society this is hardly surprising, and many of the burials are likely to be unclothed shroud burials. Copper-alloy lace ends were recovered from three of the burials: Skeletons [230], [252] and [336], but only Skeleton [252] produced a pair. Whether these were from clothing, shoes or shroud fixings is uncertain.

Nine individuals were buried with belt or shoe buckles, and one with a buckle pin. With one copper-alloy exception, all are in iron and, despite x-raying, no non-ferrous plating was visible on any example. The five shoe buckles (for example Fig. 8:5) are all of the same form, with round-sectioned circular frames and iron wire pins (Skeletons [164], [251], [252]). The belt buckles are in three basic forms. These are D-shaped frames (Skeletons [171], [242] Fig. 8:6 & 7, and [316]), circular frames (Skeletons [224] and [244] Fig. 8:9 & 10, and layer [76], in iron and copper-alloy respectively) and oval-framed (Skeleton [268] Fig. 8:8). Unfortunately, these buckle forms can only be dated widely to the medieval period.

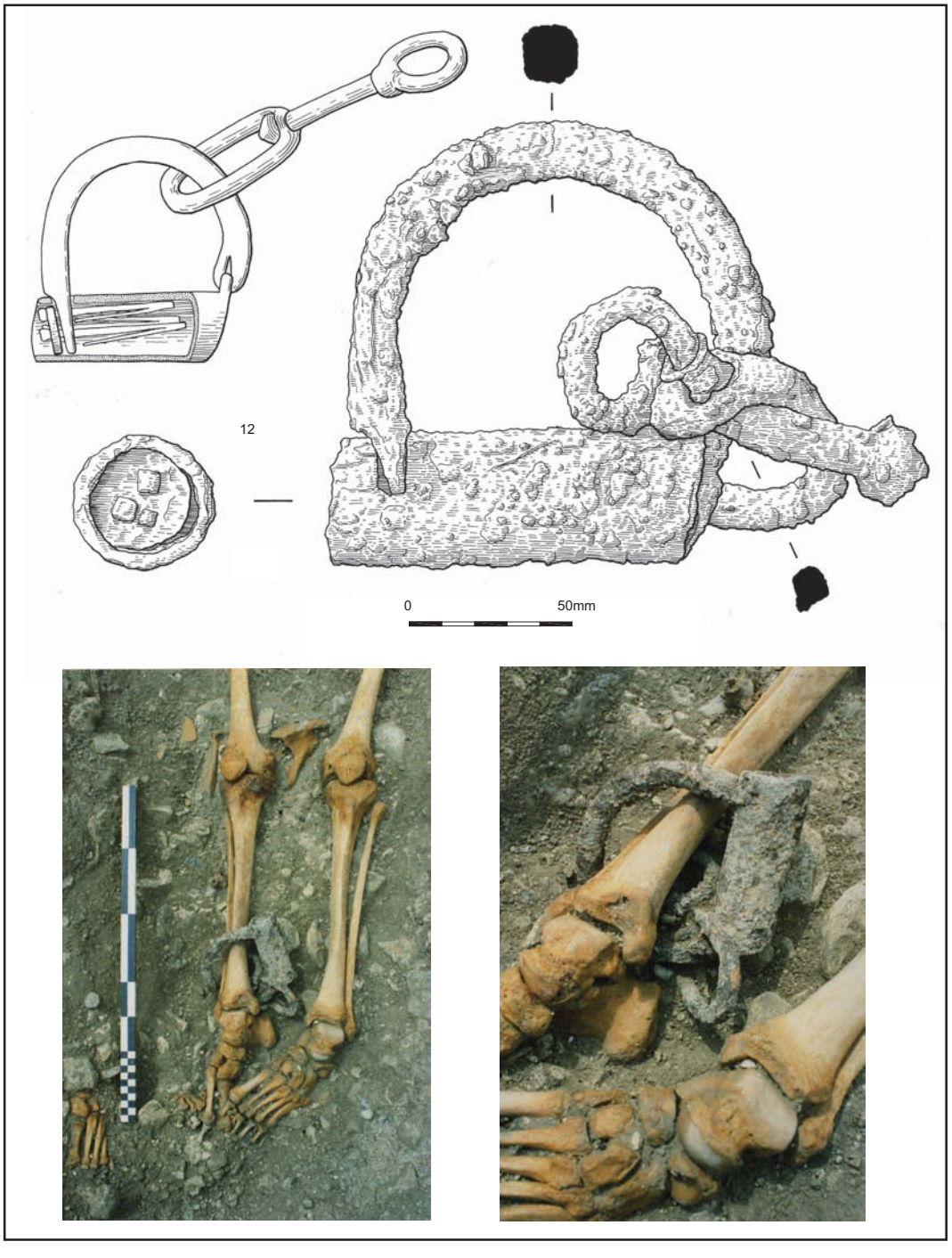

Fig. 17. Skeleton 249, manacle.

Other metalwork associated with burials included an iron manacle, a knife, a fragment of horseshoe and various other pieces of residual material such as waste lead and sheet copper-alloy fragments. It is likely that the horseshoe and knife were residual within the grave fill. However, Skeleton [249] was interred with the iron manacle around his leg (Fig. 17).

No spatial patterning was evident in the burials with regard to the sex or age of the individuals. The small female population (16 out of 81) is evenly spread across the cemetery in both chalk-cut and quarry-fill graves. The 14 infants and juveniles are also spread out but, except Skeleton [271], all are within the quarry fill. Individuals who suffered from particular pathological conditions or apparently violent deaths are likewise randomly spread.

Discussion

It does not appear that the burial practices at the hospital changed greatly throughout its development and use. Differential burial treatment is recognizable only in the form of grave type: either quarry-fill or chalk-cut graves. The chalk-cut graves were less disturbed than those in the quarry fill, and this suggests that the former had grave markers, probably of wooden construction and set in shallow post-holes, evidence of which does not survive.

The intercutting in the quarry-fill graves implies that these were not marked. This could support the theory that the chalk-cut graves were of a higher status than the rest. It is more likely, however, that the first burials were marked but repeated burials, necessitated by lack of space, removed any markers. If there was any order to the burials in the quarry fill, or if the cemetery developed in a particular direction, then this was not apparent from the available data. The reason for the variation in burial density within the area is also uncertain, but a noticeable 1–2 m wide linear band, free from burials, ran north-east to south-west across the cemetery, possibly representing a pathway (Fig. 12).

The chalk-cut graves may have contained people of higher status, perhaps the brethren rather than the inmates. However, no real difference was noted in the way the bodies were treated during burial. The larger percentage of coffins from the chalk graves may reflect their undisturbed nature and the greater likelihood of recovering nails.

Consideration of the chalk-cut graves as higher status may be questioned by the presence of a young male skeleton [177], buried with his arms apparently tied behind his back. Together with the displacement and reversal of a cervical vertebra, these factors are suggestive of a hanging. However, this assumption is based solely on archaeological evidence and no supporting evidence was discovered during the osteological analysis. Another individual, Skeleton [343], identified as a leper and restrained at death, was also within the chalk graves.

The presence or absence of coffins, shrouds or chalk-block supports may reflect a difference in the wealth of the buried individual, but if this were the case, the evidence suggests that no distinctions were made within the cemetery in this regard. Indeed, two individuals forcibly restrained at death occupied a central position within the cemetery. However, it is uncertain whether or not the iron manacle worn by individual [249] was a form of punishment or a control for insanity (see below).

It is probable that the graves in the quarry fill containing more than one burial represent the occurrence of one or more deaths in quick succession, rather than familial pairs or groups. Even a minor infection within the hospital confines could have caused the death of one or more individuals within a short space of time, enabling them to be buried together. The archaeological evidence, although not conclusive, does, however, suggest at least two familial pairs in chalk-cut graves [270] and [261]. Grave [270] contained a male [273] at the base of the cut, with an infant [271] placed in the top south-eastern corner. The grave cut was undisturbed by later burials, and the infant's location within the cut suggests that either they were interred at the same time or the grave was visible or marked when the infant was interred.

Grave [261] contained a female within an anthropomorphic chalk-cut grave, and a male above her, appearing to have been intentionally buried within the same grave plot. What remains uncertain is whether or not this occurred to save space or to avoid the hard work of excavating additional chalk graves. Interestingly, neither grave is noticeably deeper than the other chalk-cut graves, implying that they were not intentionally excavated to a greater depth for the first interment, in expectation of a second.

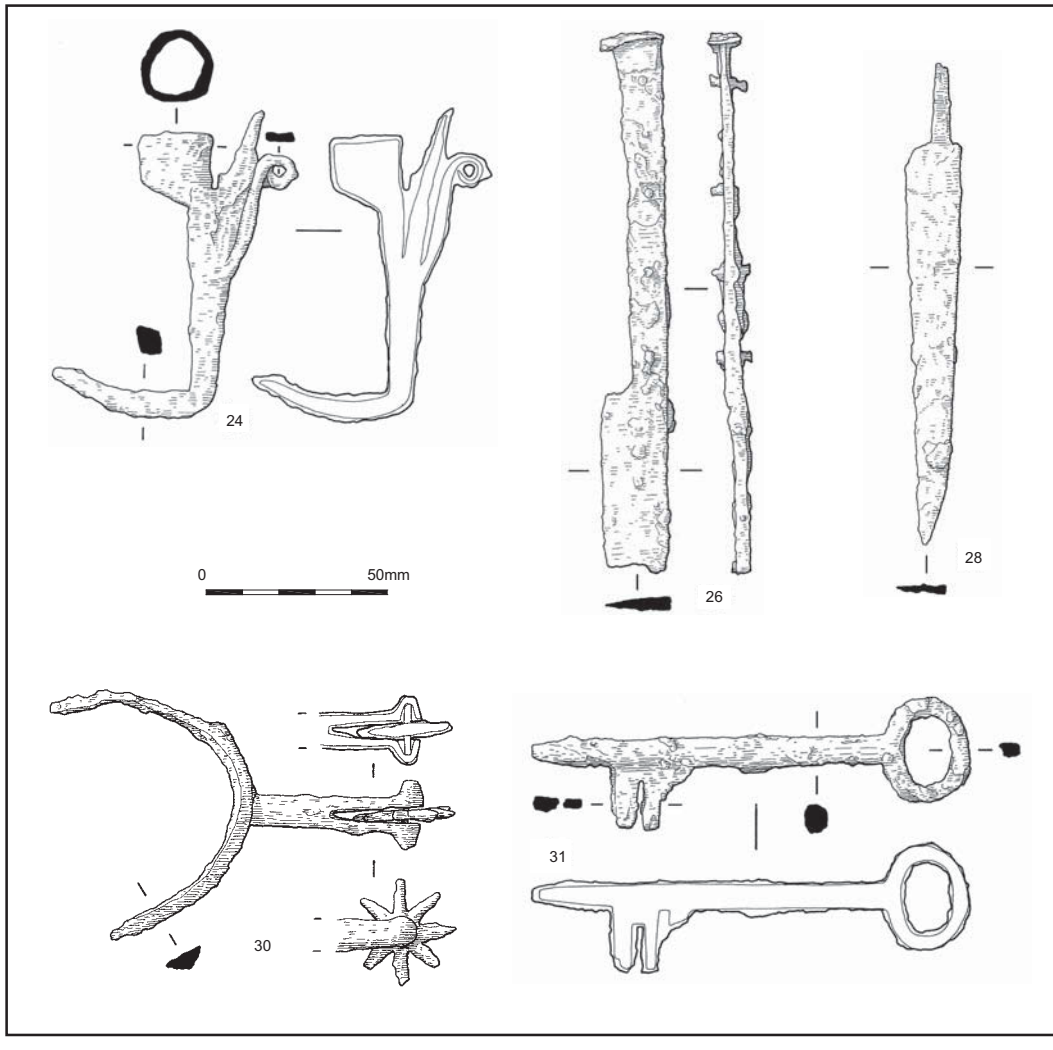

Fig. 18. Domestic iron utensils (Cat. no. 24, 26, 28, 31).

The possible existence of familial groupings within the cemetery was examined osteologically. Although a number of individuals displayed a variety of skeletal variants, in general these are distributed widely throughout the cemetery without obvious clustering.

It may be that burial practice changed with each new hospital warden, but sparse dating evidence makes it difficult to assign these practices to burial phases.

POST-MEDIEVAL DEPOSITS

Covering the southerly portion of Area B quarry [7] and overlying parts of a wall [15] and buttress [16] were two layers [18] and [19]. These layers had partially subsided into the southerly fills of the quarry and there had been some partial mixing between the lower of the two [19] with the upper of the quarry fills [30] (Fig. 7). Both layers were similar but [19] contained relatively large quantities of animal bone. Both produced many residual pottery sherds of a similar date to those in the quarry fills, but enough pottery and metalwork was present to suggest a mid fifteenth- to mid sixteenth-century date for their deposition. The metalwork assemblage from these contexts was the

largest and individually most interesting from this area. It was dominated by iron domestic utensils such as candlestick holders, knives and a key (Fig. 18:24, 26, 28, 31). Dress accessories are represented by an iron buckle (although it is also possible this buckle is from a harness) and equestrian equipment by an iron rowel spur (Fig. 18:30). The presence of an iron spoon bit indicates wood-working activities (see ADS supplement).

In the southwestern corner of Area A, two masonry walls were uncovered (Fig. 4). The earlier [211] consisted of a single surviving course of chalk, flint and greensand pieces in a clay bonding matrix, resting directly on the natural chalk. At the eastern end of the wall was a large and possibly associated post-hole [346]. A late fifteenth- to sixteenth-century midden deposit [212] abutted wall [211] to the north, suggesting a late medieval or early post-medieval origin for the wall.

A further wall [200] of later date had been butted on to the eastern end of [211], set within a narrow foundation cut. Wall [200] was constructed of irregular greensand, flint and brick pieces set in a beige gravel mortar. This wall is thought to be of 18th-century origin, representing a modification to an existing building or formation of an ancillary structure. Within the confines of this structure were an undated post-hole [207] sealed beneath an eighteenth-century mortar spread [206] and a rectangular pit [203] cut through [206] against the western edge of wall [200].

To the east of wall [200] was a well/soakaway [202]. Running into the soakaway were two rubble-filled drains [205] and [210]. Both ran below wall [200], although neither produced any datable material.

The late eighteenth- to nineteenth-century foundations of Spital cottages, as seen on the 1873 Ordnance Survey map, were located to the south of the burials. These foundations were briefly recorded prior to their removal in order to access earlier deposits. A large sump was also recorded [280/281].

Excavations in Area B revealed the most recent modern disturbance on the site. This comprised the entrance to the extant school WWII air-raid shelter, located to the south of the trench [4].

HUMAN REMAINS by Sue Browne

Introduction

The full report, including metric and post-metric analyses and additional pathological details, can be found in the ADS supplement and results have been summarized here. For the purposes of this report pathological rates of prevalence have been recorded as number showing trait/number observed; that is, 7/44 would mean a total of seven individuals displayed the trait out of 44 examined.

The skeletal remains of 103 individuals were examined. Generally preservation of the bone is very good, and 70% of the skeletons are well-preserved. Seventy-one skeletons (69%) are more or less complete and a high recovery rate was achieved for even the smallest bones.

Selected results for St Nicholas' Hospital are compared with the results for two local cemeteries, Lewes Friary (Browne 1996) and the church of St Giles, Winchelsea (Browne 2004), two non-leper and one leper hospital cemeteries, St Giles, Brough, North Yorkshire (Chundun & Roberts 1995), St Leonard, Newark, Nottinghamshire (Bishop 1983) and St James and St Mary Magdalene (Area 3), Chichester (Magilton *et al.* 2008) and the cemetery of the church of St Andrew (Period 4), Fishergate, York (Stroud & Kemp 1993).

Demography (Table 1)

The sex of 81 adults and three adolescents was determined. Sixty-six (79% of the sexed skeletons) are male or probably male (one is possibly male) and sixteen are female or probably female (one is possibly female). All the comparative sites yielded sexed samples containing more males than females, the percentage ranging from 95% at Lewes Friary to 58% at St Andrew's, Fishergate. Eighty-eight individuals (85%) are adult, one (Skeleton [288]) is probably adult and fourteen (15%) are immature. The age range in the 77 aged individuals is from neonatal to at least 45 years old, the largest number of deaths for each sex occurring in the

Table 1. Age distribution (N = 103).

Age range	Entire sample	Males	Females
0–18 mths	2		
18 mths–3 yrs	4		
12–15 yrs	1		
Child	1		
15–20 yrs/ adolescent	6	3	
17–25 yrs	30	21	7
25–35 yrs	20	17	3
35–45 yrs	11	8	3
45 yrs +	3	3	
Adult	25	14	3

group aged 17–25 years. With the exception of St Andrews, Fishergate, where over a third of the individuals were immature, the comparative sites yielded samples consisting mainly (or entirely at the Hospital of St Leonard) of adults.

Stature estimation

The mean height of the males (N = 60) is 1.72 m and for the females (N = 15), 1.62 m. The height range for males is 1.61–1.85 m and for females, 1.52–1.72 m.

Pathology

Oral pathology

A total of 73 deciduous teeth were recovered for five children aged between birth and three years; no dental remains were recovered for the other children in the sample. The only pathology seen in the deciduous dentition was traumatic in origin; a lateral incisor in the mandible of a child aged between 18 months and 3 years (Skeleton [352]) had broken off before death at the enamel-cemento junction. Apical abscessing had occurred, but the tooth root is still in its socket.

A total of 30 teeth in 17 males were almost or completely destroyed by caries, and pulp exposure associated with caries cavities was recorded in 25 teeth in 16 males. Pulp exposure from attrition (mainly recorded in individuals aged 35 years or over) was seen in 27 teeth in 11 males and 1 tooth in a female. Deposits of occlusal calculus associated with extensive dental decay and abscessing were observed in the jaws of three males (Skeletons [186], [340], [382]) and large deposits of occlusal and buccal calculus were seen in an individual of indeterminate sex (Skeleton [288]) whose age was difficult to determine (see above); the occlusal calculus suggests that affected individuals were not eating a normal diet for a period of time prior to death.

Out of 69 individuals scored, deep lines of enamel hypoplasia (indicating severe phases of infection or dietary deficiency during childhood) were recorded in three individuals (Skeletons [352], [312], [343]); interestingly all three skeletons show long-standing postcranial pathology (discussed below) and shallow lines in a further 26 individuals; the teeth of 22 out of 53 males and 6 out of 12 females show some degree of enamel hypoplasia.

The results for St Nicholas Hospital do not differ greatly from those for the hospitals of St Giles or St Leonard, but the frequency of caries cavities, abscess sites and ante-mortem tooth loss is much higher in the sample from the Hospital of St James and St Mary Magdalene, and this is probably related to the greater proportion of older adults in the sample. Perhaps the fact that St James and St Mary Magdalene was a leper hospital is also significant.

The frequency of enamel hypoplasia in the sample from St Nicholas Hospital is low compared to the findings from the other three hospitals, suggesting that the individuals in the sample from St Nicholas' Hospital had been relatively free from phases of malnutrition or infection during childhood.

Non-oral pathology

Arthropathy

Mild to moderate osteophyte formation in the spine and 'lipping' at the margin of articular surfaces, probably age-related, were recorded in many of the older adults, but more severe joint changes involving morphological modification and/or eburnation of articular surfaces, or bony union, are relatively infrequent, being recorded in only eight males and three females. The spine is involved in eight individuals (Skeletons [273], [283], [286], [322], [340], [390], [416], [444]), the wrist or hand in three ([168], [333], [444]) and the great toe (bunions) in two ([273], [374]). Interestingly, no severe changes were seen in the hip or the knee, major weight-bearing joints which are particularly subject to stress.

A variety of changes were seen in the joints of the hands and one foot of a male aged 35–45 years (Skeleton [359]). The metacarpo-phalangeal and first interphalangeal joints, described by Ortner and Putschar (1981, 404) as the predilected locations for rheumatoid arthritis, are not involved. The first metatarsal shows pitting and cystic cavities distally, but the phalanges of the great toe are normal, as is the metatarso-phalangeal joint (the classic site of involvement in gout) of the left great toe. Evidence of intervertebral disc degeneration and associated osteophyte formation, probably related to the age of this individual, was noted in the cervical (C4-7) and the lumbo-sacral (L4-S1) vertebrae. There is no evidence of sacro-iliac inflammation, but the asymmetrical and selective distribution of affected joints in the hands and foot suggests a seronegotive arthropathy, perhaps psoriatic arthritis.

Spinal arthropathy and extra-spinal soft-tissue ossification were recorded in another male (Skeleton [374]), a mature adult. While the

arthropathy in the neck may be age-related, the very large thoracic osteophytes associated with extra-spinal hyperostosis suggest more than simply degenerative changes. Ankylosing spondilitis is unlikely because the lumbar spine and the sacro-iliac articulations are not involved. Possibly the changes represent an early stage of DISH (disseminated ideopathic skeletal hyperostosis), although the thoracic osteophytes do not have the characteristic 'poured wax' appearance usually seen in DISH, nor are they exclusively on the right side.

Small 'punched out' depressions, probably osteochondritis dissecans (formed when a fragment of necrotic bone becomes detached from the articular surface), were noted in one or more articular surfaces in 11 males and 2 females. The joints involved were in the neck ([234]), shoulder ([249], [283], [315]), elbow ([355]), knee ([234], [413]), ankle ([161], [197], [224], [234]) and foot ([252], [356]). In addition, Schmorl's nodes were noted in 41/73 spines, 36/57 male and 4/13 female.

Trauma

The evidence of trauma seen in this sample ranges in severity from unhealed cuts which are likely to have been the cause of death to minor well-healed injuries.

A fragmentary cranium [180] shows a total of five cuts, ranging in length from 38 to 72 mm, in the occipital and parietal bones. In three cases the blow has removed a segment of bone, exposing the diploë and perforating the inner table of bone; the other two cuts penetrated the outer table only. A cranial fragment consisting of the incomplete left parietal and occipital bones from another individual [232] shows two deep cuts at its margins (Fig. 19). The extent of the cuts is unknown but the blow to the occipital must have almost severed the head from the body. The mandible of Skeleton [143] has been sliced in half at the symphysis and bears cut marks at three different angles and the greater trochanter of the left femur of Skeleton [372] shows a cut mark posteriorly.

A healed impact injury (11 mm in diameter) was noted on the frontal bone of male [322] and a probable ossified haematoma (diameter 30 mm), probably resulting from a blow on the head, was seen on the frontal bone of female [336].

Osteological examination of skeleton [290] confirmed the observation at the time of excavation that no bones from the left hand were recovered. Apparently this male, aged 17–25 years, had lost his left hand at the wrist after skeletal maturation, and long enough before death for healing to be completed but sufficiently recently for the arm bones to show no disuse atrophy.

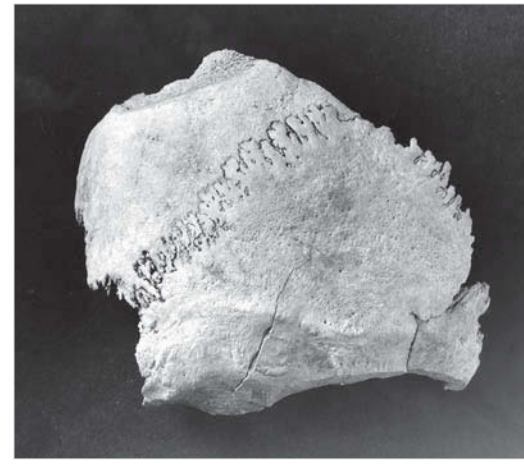

Fig. 19. Cranial trauma, skeleton 232.

Nine healed fractures were noted in eight individuals (seven males, one female). These included the fibula in [258], [309], [381], both the tibia and fibula [257] and a healed crush fracture of the fourth lumbar vertebra [249]. Healed fractures were also noted in a pubis [370] and a distal humerus [230]. An ulna shaft had healed without re-uniting [381] and a midshaft fracture of the radius [322] was in the process of healing at the time of death.

Minor injuries which had healed or were in the process of healing were noted in the sternum of male [143] and in the bones of the hand or foot of four males and an adolescent of indeterminate sex [224], [257], [322], [333], [349]. Small, more or less circular indentations (7 to 14 mm) were noted in the ectocranial surface of the frontal ([255], [382]) and parietal ([343]) bones of three males. Two indentations show mild pitting, but not active osteitis, and the third has a smooth surface. These probably represent minor, healed head injuries or, as suggested by Stroud and Kemp (1993, 223) for similar depressions, mark the site of an overlying soft-tissue lesion, such as a sebaceous cyst.

Two skeletons are included in this section because it is believed that the lesions recorded are traumatic in origin. A dislocated left ankle was noted in male [333]. The calcaneum and talus are united and the articular surfaces of the distal tibia

Fig. 20. Atrophy, Skeleton 312.

Fig. 21. Probable leprosy, skeleton 343.

and the talus show long-established inflammatory changes. The foot was malpositioned, and slanted downwards at an angle of approximately 120 degrees to the vertical. The eburnated surface of the tibio-tarsal 'articulation' is evidence that there was some movement, albeit limited, in the ankle, and the extremely modified distal articulation of the lateral metatarsals and proximal first phalanges of the left foot are further evidence of abnormal gait. The inflammatory changes suggest that the dislocation was traumatic rather than congenital.

Only the upper part of Skeleton [312] (a probable male) was recovered; the left shoulder is normal, but the right shoulder and upper arm are atrophic (Fig. 20). With so little of the skeleton available for study, explanations of the atrophy can be no more than tentative. Perhaps this is a congenital anomaly, or perhaps paralysis in the arm was a sequel to poliomyelitis. Perhaps, in view of the extreme modification of the left clavicle, it is more likely that the shoulder-girdle was dislocated in a traumatic episode a long time before death, possibly even at the time of birth, during a difficult delivery.

Inflammation and infection

Pitting of the surface of the bone (osteitis) was recorded on the maxilla and mandible of a child aged between birth and 18 months [298], on the endocranium and maxilla of a child aged about 18 months [271] and endocranially in an elderly male [309]. Pitting or striations and deposits of subperiosteal bone on longbone shafts were found in association with healed fractures [257], [258], [349]. Subperiosteal bone is present on the right femur of Skeleton [374], but post-mortem damage obscures the extent and possible cause of the inflammation. Bilateral subperiosteal striations, which do not appear to be associated with other pathology (a relatively common finding in archaeological material), were recorded on the shafts of the tibia and fibula in five adults and an adolescent: [146], [197], [236], [322], [336], [407], and deep striations and deposits of subperiosteal bone on one side only in two children [326], [366].

Two skeletons show changes suggestive of leprosy. A young male [343] showed symmetrical tibio-fibular periostitis and the osteitis and destructive changes in the lateral metatarsals typical of this disease (Fig. 21). The osteitis and osteomyelitis in the tarsals and metatarsals are very suggestive of secondary infection spreading from trophic ulcers at pressure points — the head of the 5th metatarsal bones and the sole of the foot at the heel. This is consistent with a diagnosis of tuberculoid leprosy, and has been recorded in a number of skeletons from the Hospital of St James and St Mary Magdalene. Only the feet and the distal ends of the fibulae were recovered for another adult [377], but the morphological modifications, osteomyelitis, ankylosis and atrophy in the feet and the periostitis in the fibulae are characteristic of leprosy.

An interesting finding was male [252] showing evidence of ulcers on the lower legs. Raised, oval

Fig. 22. Ulcers, Skeleton 252.

patches of pitted bone on the medial surface of the left distal tibia and the lateral surface of the right distal fibula are associated with pitting, striations and shaft expansion in the tibia and large deposits of reactive bone extending up the shaft in the fibula (Fig. 22). Obesity ulcers, usually seen in the middle-aged or elderly, are perhaps unlikely in an individual aged only 25–35 years, although the position of the limbs when the skeleton was *in situ* could be taken as evidence that he was obese; alternatively, it may simply reflect the manner in which the body was placed in the grave. Tropical ulcers would probably not occur bilaterally on the lower legs. Perhaps the ulcers were caused by irritation from chains or some other means of restraint fitted to the legs over a prolonged period of time. Evidence of the practice of forcible restraint is provided by Skeleton [249], a young male who was buried wearing a shackle on the right leg (Fig. 17); however, in this skeleton there is no inflammatory reaction in the legs.

The overall frequency of tibial osteitis as defined by Anderson (unpublished) is 16.7% (11/66 adults). This relatively high frequency (Anderson recorded nine % at St Gregory's Priory) suggests that the local population was moderately resistant to non-specific infection, since the bony reaction is proof that the individual's immune system was fighting the infection.

Porotic hyperostosis

Cribia orbitalia (pitting on the roof of the orbit) and osteoporotic pitting in the external surface of the cranial vault are generally believed to indicate some form of chronic anaemia. Cribia orbitalia was seen in 31/70 individuals. The degree of pitting ranges from severe (18 month old [271]) to mild in 19/51 males, 5/12 females and 2 children. The frequency of cribia orbitalia is higher in immature individuals than in adults and in adult females than in adult males. The highest frequency for both sexes is in the group aged 17–25 years and nearly half of the males showing cribia orbitalia (9/19) show supra-orbital and/or bi-parietal osteoporosis as well. Supra-orbital osteoporosis was recorded in 24/47 males and 0/12 females and bi-parietal osteoporosis in 10/70 males and 1/14 females.

Hyperostosis frontalis interna

Hyperostosis frontalis interna was recorded in one female [251]. This thickening of the frontal bone endocranially is typically seen in post-menopausal females and suggests that this individual (for whom there are no dental remains) was of advanced years.

Skeletal anomalies

Dental

At least one third-molar is agenic in 20/74 individuals. The upper lateral incisors in one individual [290] and a mandibular incisor in another [283] are agenic. Teeth rotated between 20 and 45 degrees from their normal position were recorded in 6/74 individuals and crowded and malpositioned teeth in 3/74 ([227], [302], [409]). In 2/74 ([194], [232]) an upper third molar is anomalous and peg-like and in a third ([336]) an upper third molar is reduced in size. A deciduous canine had been retained in one maxilla ([286]).

Postcranial

The neural arch is open posteriorly in 2/74 sacra ([168], [283]) An additional, sacralized, lumbar vertebrae is present in 3/54 ([273], [286], [336]). In another ([384]), a sixth lumbar vertebra is present but not sacralized. An additional free vertebra, transitional morphologically but more resembling a sacral than a lumbar vertebra, is present in one

spine ([283]). The separation of the neural arch of a lumbar vertebra from the centrum (spondylolysis) was recorded in total of 5/46 individuals, in L5 bilaterally ([316], [381]) and unilaterally ([234]), in L4 bilaterally ([331]), and in L3 bilaterally ([168]). A perforated sternum was seen in one individual ([381]) and the calcaneum and talus are united bilaterally in one skeleton [146]; there is no evidence of associated inflammation or trauma in the tarsals of skeleton [146] and probably the union is congenital.

Two other skeletal variants appear to be present at a higher frequency than is usually reported in archaeological material. Cervical ribs are present bilaterally or unilaterally in 13/28 seventh cervical vertebrae examined, and in four other individuals ([168], [183], [308], [312]) the anterior root of the transverse process of C7 has a morphology of a cervical rib but is not separated from the vertebrae. In 15 individuals the second and third (distal) phalanges of one and two are united to form a single bone; in one individual [244] this anomaly appears to be bilateral. The true frequency of this anomaly is unknown because not all the phalanges were recovered for all individuals.

Bearing in mind the need for caution, patterns in the spatial distribution in the cemetery of selected anomalies, or in the association of more than one anomaly in skeletons, were sought in case they might suggest groups of genetically related individuals. The results of the analyses are ambiguous, but in general the skeletal variants are distributed widely throughout the cemetery without obvious clustering. It would perhaps have been more surprising had the data suggested the presence of family groups in a hospital cemetery than that they do not.

Discussion

Detailed documentary information about medieval hospitals is scanty, and this sample from the cemetery of St Nicholas's Hospital provides a much-needed opportunity to expand our knowledge of the subject.

Ecclesiastics usually ran medieval hospitals, and many hospitals in the early medieval period took predominately adult males; later, females were admitted also. Women were cared for during childbirth, and if the mother died the child might remain in the hospital; St Mary without Bishopgate and St Bartholomew in London brought up orphans to the age of seven (Orme & Webster 1995, 111). The sample from St Nicholas Hospital covers a long time span, but most of the adults are male. Perhaps the remains of young adult females and infants are evidence of deaths associated with childbirth, and skeleton [251], a female of advanced years, appears to indicate that at some stage the hospital admitted elderly females too.

Medieval hospitals provided shelter for travellers, supported the poor and cared for the aged, the infirm and the sick. Others were founded between the eleventh and fourteenth centuries to care specifically for lepers (Roberts 1986). St Nicholas's Hospital appears to have been a non-leper hospital for most of the time, and the sample includes individuals who were suffering from a variety of complaints, such as long-term joint disease, chronic infection and disability, as well as those who probably died violently.

The presence of only four males who appear to have died a violent death does not support the anecdotal references to many of the dead from the battle of Lewes being buried in the hospital cemetery, though such remains could lie in unexcavated parts of the site. Although three of these appear to fall within the right chronological period, they pose a number of questions. If these individuals were battle victims, why were they interred at the hospital rather than in the mass graves? The severity of some of their trauma wounds indicate they were dead on arrival and would not therefore have gone to the hospital for care. Perhaps they were of higher status and warranted being buried in the hospital cemetery rather than in a mass grave. This, however, does not explain why they were not grouped in one area of the cemetery. Perhaps these individuals were killed violently at other times and brought to the hospital for care or burial by whoever found them.

The presence of 19 adults and one adolescent in chalk-cut graves may suggest that not all individuals were of the same status. The elderly are present (though few), as are one or possibly two lepers. The use of the hospital as a leper house during the thirteenth century was not evident from the few lepers recovered, but it is possible that an unexcavated part of the site contains a concentration of leper burials.

The insane were accepted into some hospitals and in 1403 St Mary without Bishopgate, London had six insane men and three other sick inmates

(Clay 1909, 33). The iron chains, manacles and stocks in this hospital's 1398 inventory were probably for restraint of the violently insane. Perhaps a similar interpretation is appropriate for the young male at St Nicholas's Hospital buried wearing an iron shackle. If the large ulcers on the legs of another individual were caused by irritation from chains, this unfortunate man must have been forcibly restrained for a long period of time before he died. Other unusual burials (those that appear to have been hanged or had a hand removed) are equally enigmatic. It is possible that some were criminals who received hard justice.

It is perhaps not surprising that there is no evidence of surgery or other medical treatment, because priests not doctors usually ran medieval hospitals, and the aim was to provide spiritual comfort and general nursing rather than medical attention (Steane 1985). The low frequency of dental caries and oral abscesses suggests good oral hygiene and/or a diet that was beneficial to oral health, but it is uncertain whether these could be attributed to the hospital regime because the number of individuals in the sample who were long-term inmates is unknown. In general the local population represented by this sample seems to have been relatively free from phases of severe malnutrition or infection during childhood, although some form of chronic anaemia was prevalent, particularly in the young.

SUMMARY AND CONCLUSIONS

Putting aside the occasional casual loss, the site does not appear to have been settled prior to the medieval period. It is believed that the hospital was founded in *c.* AD 1100 by the de Warrene family, but the earliest activity on the site appears to be the digging of the two quarries in Area A and, perhaps at the same time or slightly later, the quarry in Area B.

Any early buildings are likely to have been of timber-framed construction, soon replaced with masonry. Such wooden buildings are likely to have left no trace in the archaeological record, particularly when one considers the paucity of the later, masonry foundations at the site.

It appears that the main hospital buildings were located below the modern school building and the southern portion of Area A. This is the most prominent position at the site and would have lain next to the medieval road to the west gate of the town. Ancillary buildings, perhaps around a courtyard, would probably be to the south of this area, to the east of excavation Area B.

The food refuse from the site suggests that the diet of the hospital inhabitants was varied and that the hospital was well provided for. It should be remembered that it is uncertain whether the brethren ate the same food as the inmates and which, if relevant, the excavated data relates to. The presence of large quantities of domestic waste in Area B certainly suggests that the kitchens were close by.

Perhaps the best insight of the hospital has come from the excavation of part of its cemetery. Although dating has been problematic, this part of the cemetery appears to have been used between the twelfth and early sixteenth centuries. There are undoubtedly further burials to the south of the postulated chapel, and mass charnel pits are also known to be present in the vicinity from the re-interment of the bodies found during the construction of the turnpike road.

Following the Dissolution the site appears to have continued caring for the old and infirm, but cartographic evidence suggests that by the early seventeenth century the main hospital buildings were no longer extant and that a row of cottages/almshouses were now on the site. Situated in Area A, these buildings were undoubtedly of timber-framed construction and no discernible plan of them was found during the excavation. However, wall [211] (Fig. 4) may represent the last traces of the northern wall of these cottages just to the east of the medieval masonry gable. A further scatter of small pits and post-holes in Area A probably relates to this period.

Historical sources suggest that Spital Cottages were either underbuilt or rebuilt in brick/flint during the latter part of the 18th century, and their brick and flint foundations were recorded during machining in Area A.

Although the excavations did not provide the structural evidence for the hospital as originally hoped, they enable the first archaeological observations of the site to be made, albeit often based on circumstantial evidence. Any future excavations at the site would undoubtedly uncover further important discoveries, which may well cause a major review of the currently available data.

Acknowledgements
East Sussex County Council (ESCC) funded all archaeological work at the site. Mark Gardiner managed the project for the Field Archaeology Unit and gave much advice throughout, as did Dr Woodcock and Martin Brown (ESCC). Thanks are also due to all other ESCC staff, particularly Mr Smith. The excavation team worked extremely hard against considerable time pressures and all are duly thanked, as are all the specialist contributors to this report. Thanks also go to Colin Brent and David Martin for help with the historical work and building interpretations, and Robert Goller and Jane Russell for the illustration work. Liz Somerville would like to thank Helen Crudgington and David Dunkin for the initial identification and measuring of the shells. Sue Browne is grateful to Dale Serjeantson for help with the identifications of the fish bone, and John Magilton and Frances Lee for making available some of the results for the Hospital of St James and St Mary Magdalene in advance of publication.

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REFERENCES

Aldsworth, F. & **Freke, D.** 1976. *Historic Towns in Sussex: an Archaeological Survey*. London: Institute of Archaeology.
Anderson, T. Unpublished. *The Medieval Cemetery of St Gregory's Priory, Northgate, Canterbury: the Level of Infection*. Canterbury Archaeological Trust Research Document, 1995.
Bishop, M. W. 1983. Burials from the cemetery of the Hospital of St Leonard, Newark, Nottinghamshire. *Transactions of the Thoroton Society of Nottinghamshire* **87**, 23–35.
Browne, S. 2004. Report on the human bone from St Giles Church, Winchelsea, in D. Martin & D. Rudling (eds), *Excavations in Winchelsea Sussex, 1974–2000*. King's Lynn: Heritage Marketing and Publications, 86–93.
— — 1996**.** Human burials, in M. Gardiner, M. Russell & D. Gregory, Excavations at Lewes Friary, 1985–6 and 1988–9. *Sussex Archaeological Collections* (hereafter *SAC*) **134**, 117–21 and microfiche.
Carpenter, D. 1987. *The Battles of Lewes & Evesham, 1264/65*. Keele: Mercia Publications.
Chundun, Z. & **Roberts, C. A.** 1995. Human skeletal remains, in P. Cardwell, Excavation of the hospital of St Giles by Brompton Bridge, North Yorkshire. *Archaeological Journal* **152**, 109–245 (214–20).
Clay, R. M. 1909. *The Medieval Hospitals of England*. London: Antiquaries Book Series.
Dunning, G. C. 1961. Medieval chimney pots, in E. M. Jope (ed.), *Studies in Building History*. London: Odhams Press, 78–93.
[Dunvan, P.] 1795. *Ancient and Modern History of Lewes and Brighthelmston*. Lewes: W. Lee.
Gardiner, M. 1992**.** The pottery, in P. Drewett, Excavations at Lewes Castle, *SAC* **130**, 83–8.
Godfrey, W. 1959. Medieval hospitals in Sussex, *SAC* **97**, 130–36.
Lake, R., Young, B., Wood, C. & **Mortimor, R.** 1987. *Geology of the Country Around Lewes*. Keyworth: British Geological Survey. HMSO.
Machling, T. 1993**.** *An Archaeological Evaluation at the Site of the Proposed Urban Resource Centre at St Anne's School, Western Road, Lewes*. East Sussex Project No. 1993/89. Unpublished Archaeology South-East Report.
Magilton, J. R., Lee, F. & **Boyslton, A.** (eds), 2008. *Lepers Outside the Gate: Excavations at the Cemetery of the Hospital of St James and St Mary Magdalene, Chichester, 1986–87 and 1993*. York CBA Research Report **158**. York: Council for British Archaeology.
Orme, N. & **Webster, M.** 1995. *The English Hospital 1070–1570*. London: Yale University Press.
Ortner, D. J. & **Putshar, W. G. J.** 1981. *Identification of Pathological Conditions in Human Skeletal Remains*. Smithsonian Contributions to Anthropology **28**. Washington: Smithsonian Institution Press.
Prescott, E. 1992. *The English Medieval Hospital 1050–1640*. London: Seaby.
Roberts, C. 1986. Leprosy and leprosaria in medieval Britain, *MASCA Journal* **4(1)**, 15–21.
Steane, J. M. 1985. *The Archaeology of Medieval England and Wales*. London: Croom Helm.
Stroud, G. & **Kemp, R. L.** 1993**.** Cemeteries of St Andrew, Fishergate. *The Archaeology of York*: 12/2, *The Medieval Cemeteries*. York: Published for York Archaeological Trust by the Council for British Archaeology.

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