

The excavation of two late medieval kilns with associated buildings at Glapthorn, near Oundle, Northamptonshire

BY A. G. JOHNSTON*, P. J. FOSTER* AND B. BELLAMY**

With contributions by T. Pearson, M. Taylor and D. Jones

SUMMARY

Two late medieval potting and tiling establishments with kilns and associated buildings discovered in Glapthorn, Northamptonshire, have provided the first evidence of dual function kilns used to burn lime between pottery firings.

INTRODUCTION

The site at 'Leacroft' (Glapthorn, Northants) was discovered during garden landscaping in 1983 and subsequent excavations revealed evidence of a 15th-century pottery and tile kiln with an associated building. The 'Gypsy Lane' site was identified during field work in 1978. These two sites add to the growing number of broadly parallel, rural, medieval pottery industries discovered in the area, including the substantial parts of four excavated tenements at Lyveden spanning the early 13th to the mid-15th centuries (Bryant and Steane 1969 and 1971; Steane and Bryant 1975). A similar date range can be applied to the evidence of pottery manufacture at Stanion (Bellamy 1983b). In addition to these kilns, the late medieval to early post-medieval kiln site at Wood Newton should be included (Mynard 1980). On present evidence it seems that the Glapthorn workshops equate with the final production phases of the pottery industry in the Lyveden/Stanion region. An unexpected element is the use of the kilns for lime-burning between pot firings.

PART I — THE KILNS

FIELDWORK AND DOCUMENTARY EVIDENCE

The Leacroft site (TL 0205 9570) lies within the modern village of Glapthorn, and the Gypsy Lane kiln (TL 0245 9072) is situated to the east of the village in an area which has been deserted since the late 16th century (Fig. 1). Both kilns were making

an almost identical range of products and are probably of comparable date. An accounts book of the Duke of Buckingham's Manor in 1483 (NRO Bru Bxiii 15, 26v), at that time in the tenure of John Mores/Morrice, lists materials for repair of the manor:

'To the potter for six score crestis . . . 12 shillings.'

A rental in the same book (p. 17) lists Walter Brassbrygge, potter, paying 11s. for two cottages, 'which he says are in decay'. The name 'Brassbrygge' is perpetuated in Bracebridge Hill on the modern map of Glapthorn.

CLASSIFICATION OF KILNS.

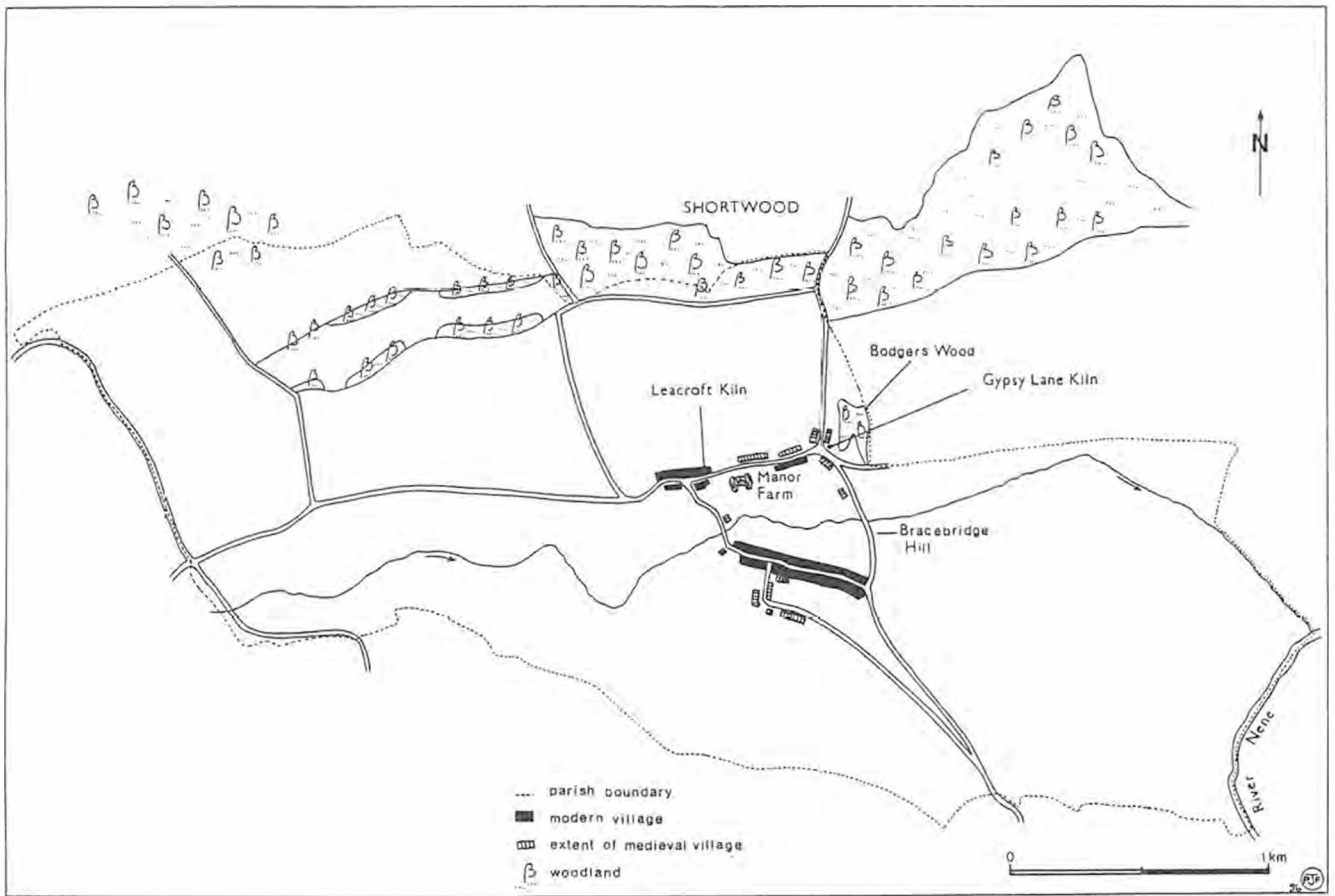
Both kilns belong to a variation of Type 2c as defined by Musty (1974), having two opposing stoke holes and a central pedestal on which the load was stacked. The Leacroft kiln shows evidence of extensive alteration to the pedestal, and at Gypsy Lane the pedestal was re-designed and completely replaced and the back stoke hole dispensed with. The new design accords with Musty's Type 1b.

Other kilns in the area have been classified as Type 4a(ii) — Lyveden (Steane and Bryant 1975, 52), or a variant of 4a — Stanion (Bellamy 1983a, 153). The kiln at Woodnewton (Mynard 1980, 160–62) and the later kiln at Lyveden (Steane and Bryant 1975, 34) were rectangular tile kilns.

THE EXCAVATION OF TWO LATE MEDIEVAL KILNS WITH ASSOCIATED BUILDINGS



a



b

Fig. 1. (a) Regional and (b) local location maps.

THE LEACROFT KILN

Geology and stratigraphy

The site lies on Blisworth limestone (Great Oolitic Limestone) with a covering of brown oolitic clay and limestone rubble. This limestone had been quarried away in antiquity and the area back-filled with oolitic clay and limestone rubble. The next phase of activity was a large structure represented by several walls with deep foundations which had been built into this infill in the 13th or 14th centuries, including a substantial stone building demonstrating several phases of use. Following this the structures were modified, partially demolished and incorporated into the kiln and associated building. The site is situated on a south-west facing hill; the gradient is probably artificial to some extent due to the diverse activities carried out in the area. A Fluxgate Magnetometer survey of the garden carried out by Adrian Challands (unpublished) was not conclusive.

The excavation

The site was excavated in two stages, with Area B investigated on the basis of the results of Area A.

Area A. The kiln (Fig. 2)

The kiln was a substantial structure (Fig. 2) with thick, clay-jointed limestone rubble walls and opposing flues. Only the flue channels and below-ground structure had survived, cut into the side of a hill, leaving no evidence for an upper chamber floor apart from fragments of kiln bars recovered from the infill. The parts which had survived, however, were well preserved, standing to a height of 45 cm and were rendered with a smooth, hard-fired clay lining.

The horse-shoe shaped kiln was 4.6 m long and 4.6 m wide and had walls which were 1.0 m thick, becoming wider towards the front, and forming a flat facade with a rebated entrance to the west stoke hole. The hard-baked clay floor of the kiln, burnt to a depth of 8 cm, was 2.2 m long and 2.2 m wide (Fig. 2, inset phase 1) and had been carefully built with coursed limestone rubble, mortared and coated with clay. The flue channels were 80 cm wide at the base, but widened higher up as the walls of the kiln and pedestal were battered, presumably to support the chamber floor. The nose of the pedestal facing the west stoke hole had been modified twice; first another (or replacement) nose had been added (inset phase 2), then later an extra nose was added and also a baffle along each side of the pedestal which narrowed the flue channels to 65 cm (inset phase 3). At the same time, large flat stones had

been used to raise the level of the floor within the west stoke hole, at the point where it had been scooped away when raking out the remains of fuel.

The west stoke hole was 1.3 m long and 1.2 m wide and led out to a stoke pit some 6.0 m long. This was a very shallow, poorly defined feature which sloped down into the mouth of the kiln. Some areas appeared to have been roughly lined with small flat limestone rubble and pale yellow clay. The northern boundary of this feature was formed by the remains of an earlier wall which turned south at its east end, to run below the walls and floor of the kiln.

The smaller, opposing east stoke hole was 60 cm wide, and built through the curving back wall of the kiln. The stoke pit to this flue was a clearly defined stepped oval depression, 2.2 m long and 1.6 m wide, lined with pale yellow clay and small flat limestone rubble, deepest where it met the kiln at 46 cm.

Layers in the kiln (Figs. 3 and 4, Appendix 1)

On excavation it became apparent that the kiln had been used to burn limestone as well as to fire pottery. The flue channels were filled to ground level with firing debris consisting of burnt limestone, fired clay jointing material, pot and tile sherds, much of which was over-fired and showing signs of sintering and bloating, plus the remains of kiln bars and powdered white lime. Layers of powdered lime were deposited in the flue channels, each several centimetres thick, every layer on its own bed of black ash (Figs. 3 and 4, layers 21, 24, 25, 27, 28, 36, 39, 47, 63, 67, 68, 70, and 74). Some of these layers were traceable through the west stoke hole and into the stoke pit where there were small mounds of lime. Only one early limestone firing (Fig. 3, layer 36) had left a deposit which extended through the east stoke hole. Interleaved between some of the layers of lime were heavily burned pot and tile sherds; it was clear that little cleaning had taken place between firings, as the baffles on each side of the pedestal lay on top of layers of lime and pot. In all thirteen clear layers were identified.

The flue channels had gradually filled up with firing debris until the smaller, east stoke hole at the back of the kiln was completely blocked, at least to chamber floor level, whilst some space remained below the floor level along the sides. There had been a late firing of lime on top of many pot firings (Fig. 4, layer 4) and then the kiln was demolished. In the region where the west, main stoke hole opened into the kiln, a bank of stone and hard-fired clay had fallen into the entrance (Fig. 3, layer 17). The point where springers for arches might have arisen was badly damaged and the floor and stones on the inner sides of the entrance and the various noses of the pedestal had lost their protective clay rendering and showed evidence of very severe heat.

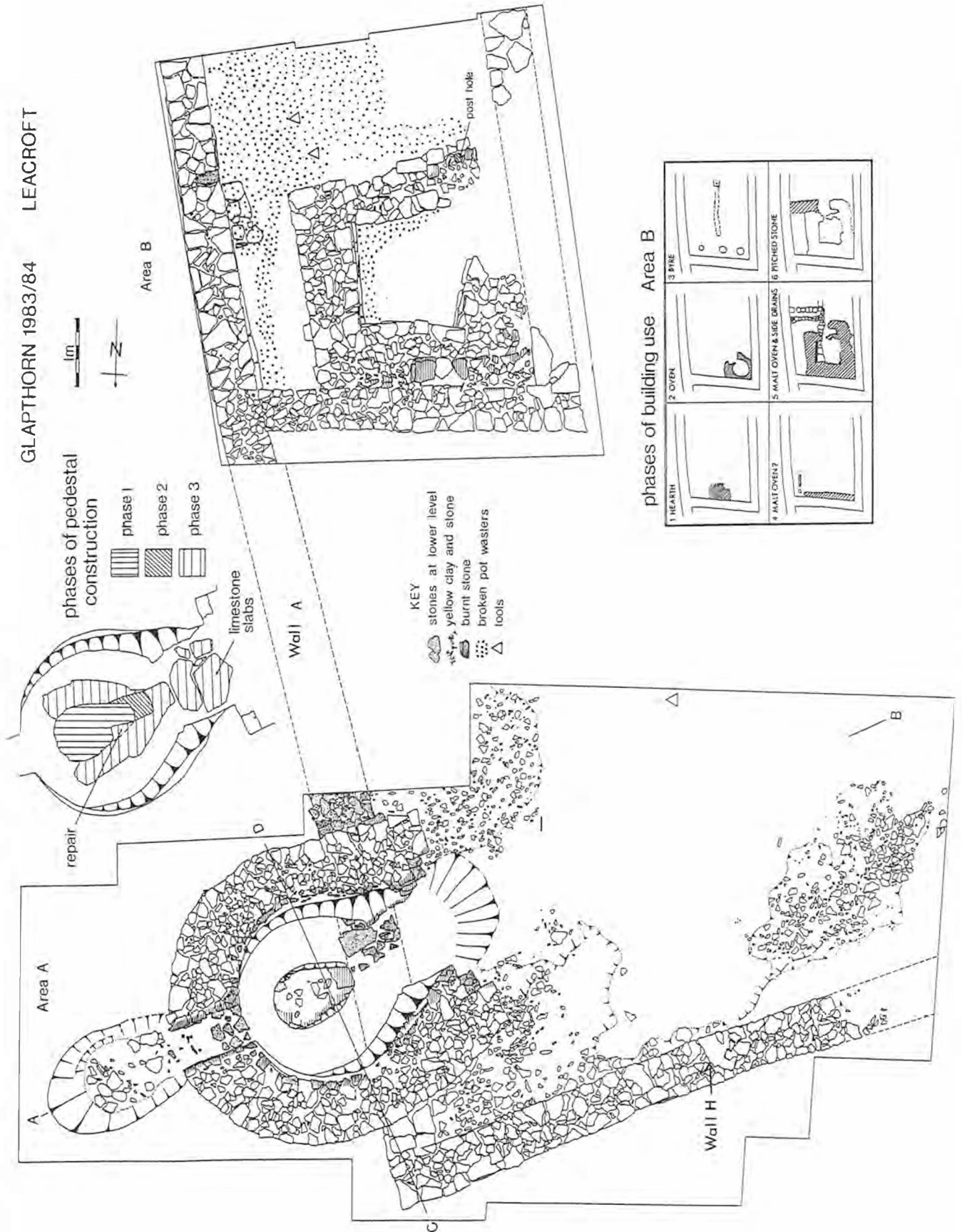


Fig. 2. Plan of Leacroft kiln and associated workshop.

THE EXCAVATION OF TWO LATE MEDIEVAL KILNS WITH ASSOCIATED BUILDINGS

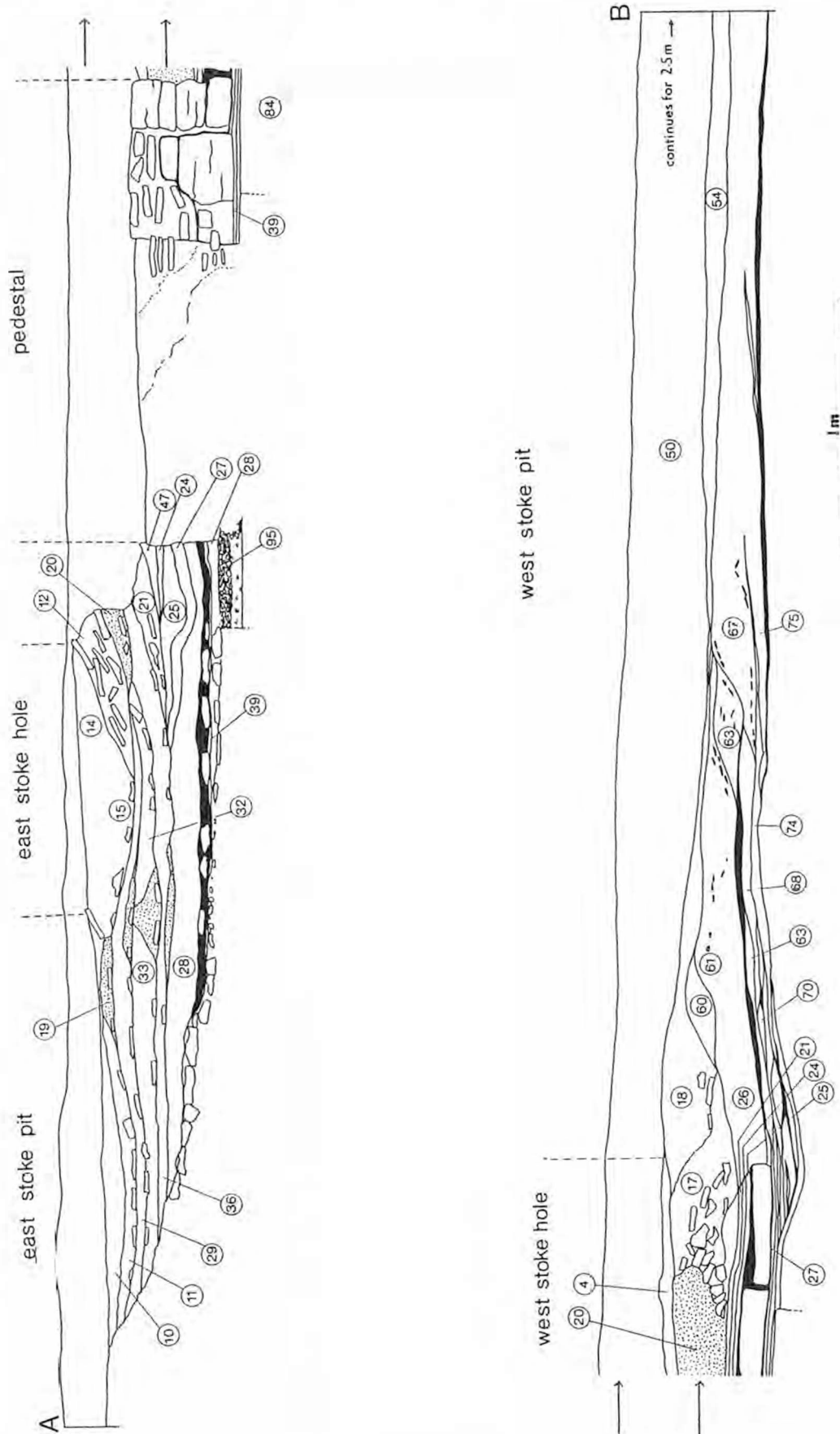


Fig. 3. Longitudinal section through the Leacroft kiln and stoke pits. For context list see App. 1.

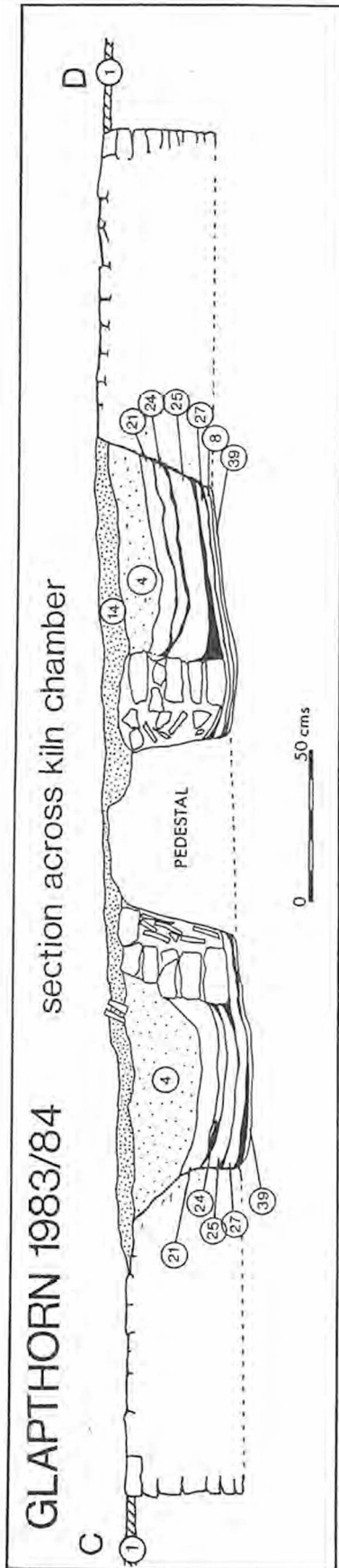


Fig. 4. Section through the Leacroft kiln to show the lime layers. For context list see App. 1.

Layers in the stoke pits (Fig. 3, Appendix 1)

The east stoke pit had been filled to ground level with seven clearly defined layers of firing debris. The uppermost layer was at the base of garden topsoil which was heavily cultivated each year.

The west stoke pit was less easy to quantify because of its size and the thinness of the layers. Ever decreasing semi-circles of ash, charcoal, clay and pot sherds surrounded the stoke hole entrance, with extra heaps of red burnt stone and clay on the north side, and a final demolition layer at the entrance. This stoke pit was sealed by a layer of clean brown silt, 10 cm thick at the south side, but thinning out to nothing to the north, from which a silver coin of Elizabeth I (1583–1604) was recovered.

The kiln was sited so as to make use of an earlier wall which ran north-south across the site. It was not possible to say to what height the wall had been standing when the kiln was constructed, but wall stone had been incorporated into the kiln walls on the north side to a height of 20 cm, the kiln wall being built directly on top of it at this point. The wall was also visible in the floor of the kiln, immediately west of the pedestal, and may have been used as part of the floor in an area which had to withstand the most intense heat and wear. On each side of the kiln, above the remains of the wall, was a bank of mixed yellow clay and stone rubble, 1.50 m wide and 30 cm thick, contaminated with 13th- and 14th-century pot sherds and in its upper regions with pot from the kiln. Below these banks of clay, a thin layer of brown clay soil completely sealed the remains of the wall and continued round the back of the kiln, forming a heavily trampled and compacted surface covered with sherds from the kiln pressed into its surface. Only a small area was available for examination and no features were identified.

Pre-kiln features

Area A (Fig. 2)

At some time during the 13th or 14th century, a stone pit was cut into the side of a small hill; the size of this pit was not determined as its boundaries were beyond the limit of the excavation. This quarry was backfilled with a mixture of blue/brown clay and limestone rubble. Subsequently, a coursed stone rubble wall 70 cm wide (Wall H, Fig. 2) was built along the north inside edge of the quarry, with foundations 70 cm deep cutting the quarry backfill. The wall ran in an east-west direction and at its east end turned at right angles to run south (Wall A, Fig. 2) for a distance of at least 17 m where it ran off the modern property; at the west end of wall H stone had been removed to a depth of 70 cm, then levelled with a mixture of yellow clay and a large amount of charcoal, pot and tile sherds similar to the kiln debris. It was thought that this might be material from another kiln, but the Fluxgate

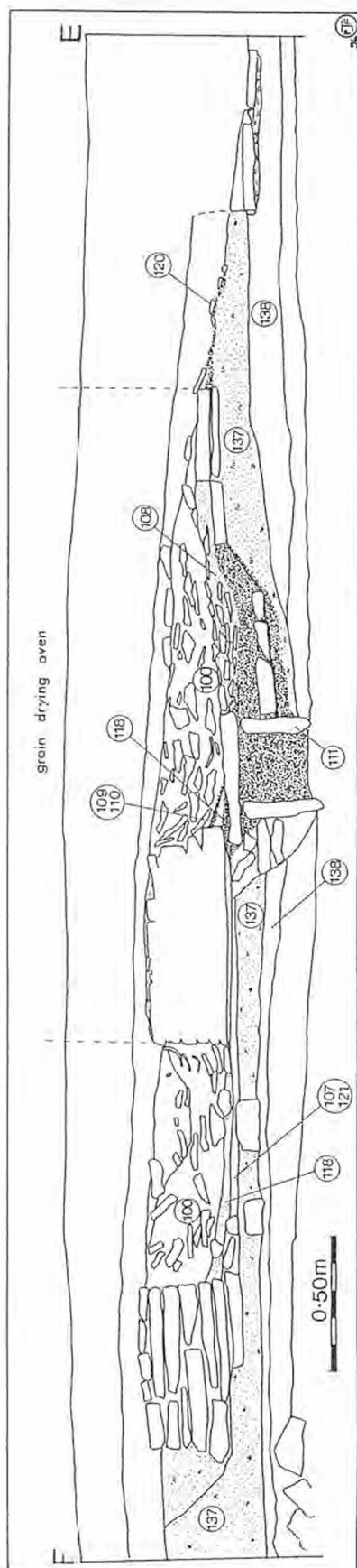


Fig. 5. Section through the associated workshop at Leacroft.

Magnetometer survey of the area around was not conclusive.

There was an appreciable bend and sag half way along Wall H because the footings, although 70 cm deep, were set into the redeposited soil on a scree of loose limestone rubble. A small amount of kiln debris had spilled over the wall at the point of sag, but elsewhere the debris respected the wall and was banked up against it in a layer 6–10 cm thick.

A very fragmentary clay and limestone metalled floor was in evidence on both sides of this north wall and also in the corner near the kiln. Beneath the kiln wall in the north west quadrant, and extending out beyond the wall, an area of flat limestone packing in a matrix of yellow clay had been used to level the ground above a small circular pit, 1.0 m in diameter and 39 cm deep, which contained a dog skeleton and domestic refuse in the form of shelly pottery of 13th- and 14th-century date which was exclusively from Stanion and Lyveden (Steane and Bryant 1975, pottery types A and B: 63–73) and some animal bone.

Area B The associated building (Fig. 2, insets and Fig. 5)

A small exploratory trench was initially opened to the south of the kiln in order to determine the nature and extent of Wall A which continued southwards away from the kiln. At a distance of 4.0 m a stone-walled building had been butted up against it. The pottery recovered showed that in its later phases this building had been associated with the pottery industry.

The excavation was extended to reveal the northern end of a building with 60 cm thick, clay-jointed limestone rubble walls, which cut into the back-fill of the quarry to a depth of 35 cm on the north and east sides, but only 5 cm on the west lower down the slope, terracing it into the hillside. The west wall had mostly been robbed out and just the foundation of yellow clay remained. The southern end of the building remains unexcavated beneath the property boundary. In all, an area 4.0 m × 5.0 m was excavated completely revealing a complex history of at least seven phases before demolition. Only the last two phases, 6 and 7, were related to pottery production.

Phase 6 (Figs. 2 and 5)

On excavation, the north and east walls of a drying oven were standing to a height of 30 cm — a similar height to all walls on the north and east sides. The south and west walls had been subject to landscaping or had been demolished or robbed to ground level.

Within the walls of the drying oven, forming a new and level floor, a roughly triangular pad of small flat limestone rubble and pale yellow clay had sealed all earlier layers. The floor area south of the oven

had been cobbled with pitched limestone and two stone-lined and capped drains inserted, draining east-west from the inner face of the east wall and cutting into a central drain 111 (Fig. 5). Another drain (Fig. 2, inset 5) was a rather poor effort, being 40 cm wide internally but never more than 8 cm deep. The square base lay on top of the metalled floor and the capstones lay on top of the pitched limestone floor. Several of the capstones of this drain were cracked and tilted and the channel had silted up completely with orange clay and contained sherds of Glapthorn pot.

The entire floor area was covered in a thin layer of orange clay soil (Fig. 5, layer 120) upon which was trampled a large quantity of small underfired sherds of Glapthorn pottery. A rough stone 'bench', 1.0 m long and 40 cm wide consisting of flat limestone rubble slabs, rested on the projecting base stones of the east wall, whilst the front and sides were supported by upright stones set into the ground. This feature stood only 10 cm above the ground surface and was respected by the pitched limestone floor.

Phase 7 (Figs. 2 and 5, Appendix 2)

Demolition.

After pottery production had ceased the building was demolished, presumably at the same time as the pot kiln. The inside of the walls had been filled with a mixture of small limestone rubble and clay (layer 100). Some larger blocks of limestone remained but the best stone had obviously been removed, leaving behind patches of pale yellow clay jointing material. The walls had been demolished to various levels to match the slope of the hill, ranging from nil on the west side to 35 cm on the north and east. Large stones and a large amount of pottery were recovered, particularly from along the inside face of the east wall, where complete vessels (broken but restorable wasters) appeared to have either fallen off a shelf or been deliberately thrown in. A complete but broken jar was also recovered from within the walls of the drying oven. Two trimmed sections of animal rib and a notched knuckle bone, believed to be tools, were intermixed with the rubble (Fig. 6). No sherds were found on top of the drying oven walls, which would suggest that they may once have been standing to a higher level, perhaps bench height.

DISCUSSION OF THE LEACROFT KILN

The pre-pottery phases

The earliest activity on site was a shallow limestone quarry which was back-filled with a mixture of limestone rubble and orange/grey clay from which was obtained pottery of Lyveden/Stanion type of the 13th and 14th centuries. The stone was of a quality

fit for use as faced rubble walling. A major building of 14th-century date in Glapthorn was 'Brown's Manor' (Fig. 1), situated 200 metres to the south east of the site, with its associated dovecote which, until 1984 occupied the next plot of land to the east of the kiln. Recent survey work on the building known as 'Manor Farm' (Fig. 1) records the presence of two good-quality 14th-century stone doorways, thought to be the remnants of the earlier manor house (RCHM 1984, 78).

At a later date a stone-walled enclosure was built over the quarry fill; tagged on to the inside of the enclosure wall was a stone building. It was divided into two sections; the northern end, which had an earth floor throughout its life, started out with what might have been a smithing hearth from which a pony shoe was recovered. This structure was destroyed when a circular oven was built into the north-west corner. Similar ovens have been found at West Cotton, Raunds, Northants (Windell *et al.* 1990) attributed to the mid 13th century; at Furnell's Manor in Raunds (Audouy forthcoming) in a 15th-century context, and at Grafton Regis (Ricket 1985) where it was associated with a malting oven. More locally an oven thought to be 13th- or 14th-century in date was excavated at Southwick, two miles to the north, and was identical in size and form (Johnston *et al.* forthcoming). Subsequently the building was turned into a byre with a tethering bar and central drain. The floor of this section had been deliberately sealed with a layer of earth which yielded sherds of Surrey whiteware, Cistercian ware and a medieval belt buckle of 14th- to early 15th-century date (Oakley 1979, 251; fig. 137 nos. 44-5.). Following the byre phase a typical drying oven/malting kiln was constructed.

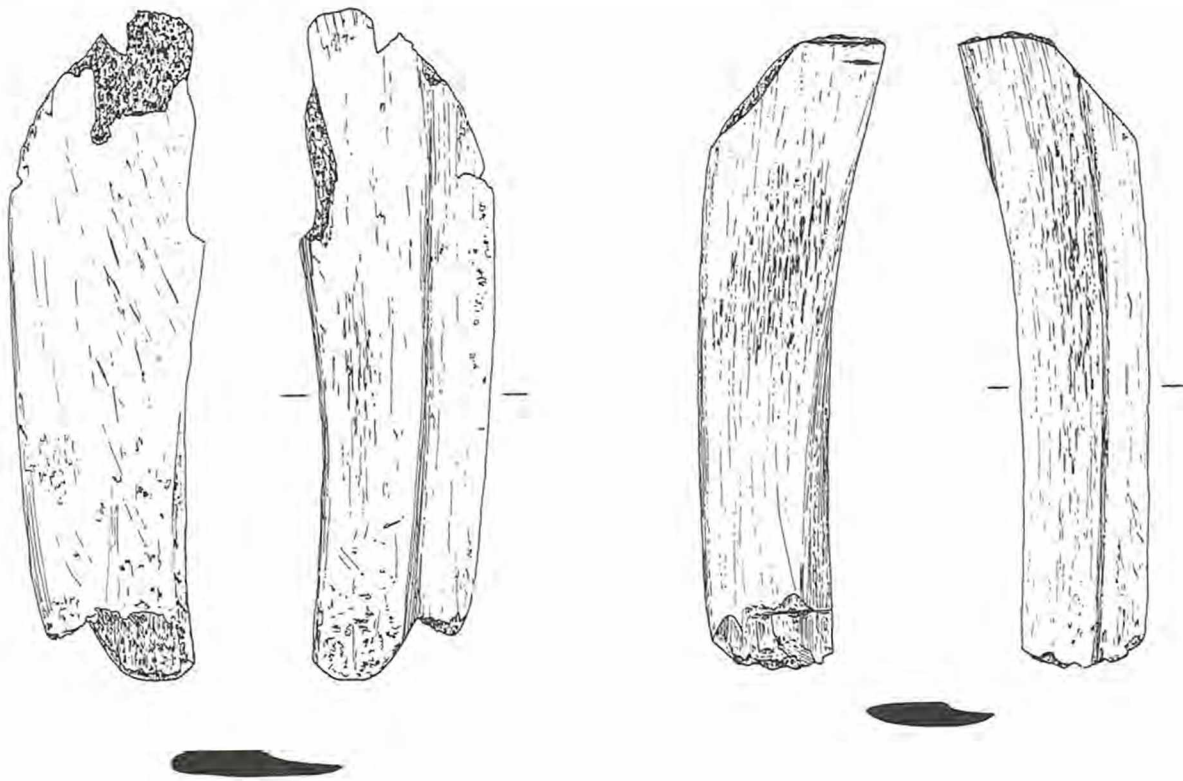
Almost identical structures are recorded from Raunds (West Cotton and Furnell's Manor and at Grafton Regis). Charcoal from firings within the structure had completely filled the central drain of the earlier phase. Analysis of charcoal from the hearth, oven and the larger drying oven would suggest that all were being used in the drying of arable crops. Although the final structure is similar in every way to structures which have yielded sprouted barley grains and have therefore been considered to be malting kilns, the Glapthorn example contained no evidence of such activity. The same problem was encountered at Grove Priory, Bedford (Robinson in prep.) and at Marefair, Northampton (Slater 1979, 79). The kilns at Raunds, Furnell's Manor, and West Cotton (*ibid.*, 22) showed a similar range of arable crops and weeds.

The pottery phase

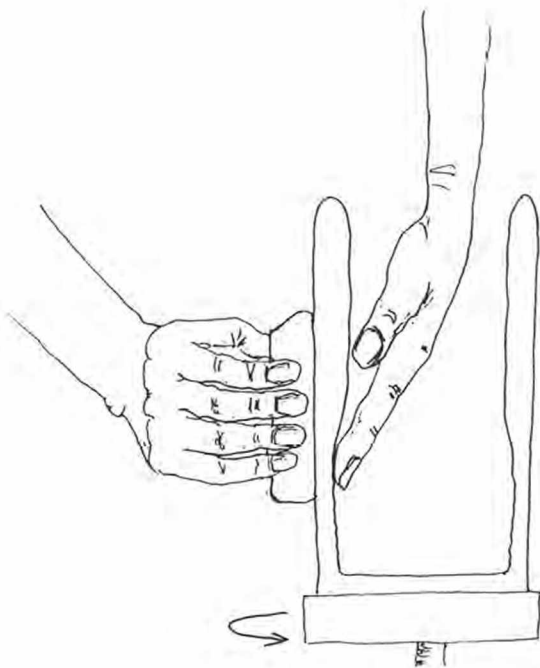
Workshop (Fig. 2, areas A and B; phase 7)

The general impression of the property prior to the

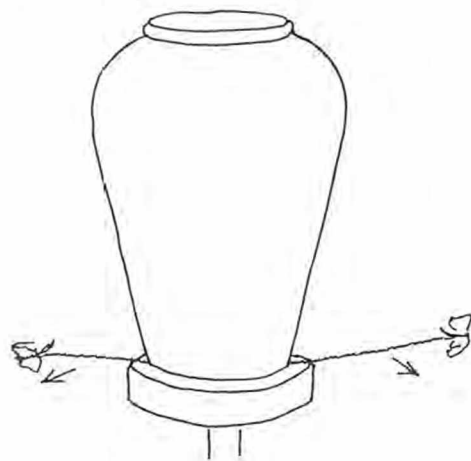
THE EXCAVATION OF TWO LATE MEDIEVAL KILNS WITH ASSOCIATED BUILDINGS



a



b



c

Fig. 6. a) Bone throwing ribs from Leacroft. b) A throwing rib in use. c) Cutting a pot off a static wheel using wire or string.

construction of the kiln and decline of the building is one of dereliction. The north wall of the enclosure had collapsed and a layer of brown earth covered the remains of the east wall. The building may have been in a similar state. If this is one of the cottages mentioned in the document (NRO, Bru Bx iii 15, 17) the potter Walter Brassbrygge states that it is 'in decay'. The division in the room seems to have persisted until it was modified to become part of the pottery. A small decorated stone mortar of the late 13th century (Martin Howe pers. comm., Peterborough Museum) was used to fill the slot in the wall and a pitched stone floor and drain were put in at the south end. The floor was renewed inside the drying kiln with an unburned limestone and clay packing. The condition of the drying kiln at this stage is open to some speculation. The whole floor of the building inside the kiln and around it was covered with a thin layer of underfired sherds, providing an absorbent and less slippery surface to walk on. The generally large size of the pots would preclude the oven being used as a damp cupboard. A larger entrance would be necessary for it to serve any function other than that of its original purpose and it may be that the west wall was partially removed to provide this. No pot sherds were found on top of the kiln walls, so it is likely that they were standing to a higher level, possibly to bench level where they could be used for many of the processes in potting. The drain in the south end must have proved to be inadequate because another, deeper one was put in parallel to the first. The chief problem may have been that the main drain into which both of these subsidiary drains were cut, was already full of earth and charcoal from the drying kiln phase. The low stone bench along the east wall also relates to this phase.

On removal of the demolition rubble it was clear that the east side of the building had been used to store useable 'seconds' bowls and jars. At demolition these had either been deliberately thrown in or had fallen off a shelf and smashed along the east wall. Many of these were completely restorable, as was another jar found up against the wall inside the drying kiln.

Mixed in with the rubble were three bone potting tools — two throwing ribs (Leach 1971, 278) and the other a knuckle which was partly notched and may perhaps have been used to hold the wire with which the pots were cut off the wheel-head. (Fig. 6; only two are illustrated). String or gut marks can be seen on some large bases as almost straight lines, indicating that the wheel was static.

The potting kiln

The kiln was an updraught type, probably a truncated tower shape with an open top through

which it could have been loaded. The mounds of earth on each side of the kiln have been recognised in other places (Young 1979, 112–14) and may be something to do with easier access when loading or unloading. No evidence for any kind of temporary cover was found at Leacroft so it is assumed that whatever was used, perhaps planking, did not have any permanent supports. When the kiln had been loaded, a thick layer of broken pot and tile sherds was placed on top of the load to assist heating and also to protect the contents of the kiln from thermal shock once firing had finished. The sintered and bloated nature of much of the pot in the stoke pits would support this theory.

Fuel is likely to have consisted of loppings of underwood and hedges from the nearby woods of Shortwood or Bodger's Wood (Fig. 1). Analysis of the charcoal (see opposite) suggests slowly-grown undergrowth gathered from the forest floor. The wide entrance and stoke hole would have provided ample space to burn such a bulky fuel. Potters in the Algarve still use updraught kilns with wide stokeholes, burning almond shells tipped in by the barrow load (personal observation by author). At the termination of firing, likely to be at least twelve hours, the stoke hole entrances would be blocked completely with stone and clay, to prevent the entry of air so as to avoid cracking the red hot pots. The piles of burnt clay at the entrances to both stoke holes would be the remains of this process.

The east stoke hole is an unusual feature whose purpose is not clear. It may have been considered necessary to have two small fires going at the start of a pot firing, rather than one large one which would be inclined to heat the load unevenly and too rapidly. There is evidence for only a very limited fire within the channel itself, which unlike the large stoke hole, was not lined with a protective layer of clay. It may have been a feature necessary for starting the fuel off when lime burning (see below p. 40). This stoke hole eventually blocked with firing debris to a level above the chamber floor and became defunct.

The potter seems to have needed to modify the design of the kiln throughout its life. There is a critical relationship between the size of the flues and the height of the chimney, and blocking of the flue channels may have created problems which were not easily remedied. A question never really resolved was whether the flues had ever been cleared out; this seems unlikely as there were no discrete dumps of mixed lime and pot in the stoke pits. Similar build-up in the firing channels was seen at Stanion (Bellamy 1983a, 156).

The pedestal was extended twice towards the front of the kiln and eventually baffles were attached to the sides, narrowing each flue channel by 20 cm. The top of the pedestal was sufficiently intact to show that no permanent floor had existed; the kiln

bars recovered must therefore have rested across the flues, supported only by the fact that the walls of the kiln and pedestal were battered to leave a ledge. During all the attempts to control the flow of heat, the pot and lime firings continued and the flue channels were eventually allowed to fill up until almost level with the top of the pedestal; one is left wondering if below-floor flues were necessary at all.

CHARCOAL FROM THE KILN STOKE-HOLE, LEACROFT 1984

by Maisie Taylor

The charcoal submitted for analysis was all carbonised to a uniformly high standard. The original wood which formed the charcoal seems to have been of a fairly uniform size: roundwood from 10 to 20 mm in diameter. The only variability seems to be in the species, which varies from fairly slow-grown hazel (*Corylus avellana*) to very slow grown ash (*Fraxinus excelsior*) and oak (*Quercus sp.*). All three species would make first class charcoal for fuel for a kiln. The presence of so much relatively slow-grown roundwood suggests the collection of wood from the forest floor, rather than coppicing to produce specific material. This might also explain the mix of species, as one or two productive coppice stools can produce quite large quantities of single species fairly quickly. The fast growth pattern is one of the features of coppiced material which may be detected in the rings. For material to have been growing as slowly as this roundwood there must have been considerable competition for light and moisture, such as may be found in a forest environment.

LEACROFT — THE DATING EVIDENCE

by T. Pearson

(with additional information by A. G. Johnston and B. Bellamy).

It seems likely that the Leacroft kiln was not the first but one of at least two kilns which were in operation in the village and that these form part of a group of kilns in production in the late 15th century. An undated medieval kiln at Lyveden (SP 9895 8720) set three quarters of a mile to the north-east of the pottery village was using the same fabric and, judging from the material derived from fieldwalking, almost identical forms. Lyveden 'D' ware from the main site, dated to mid to late 15th century (Steane and Bryant 1975, 91–92) is also similar in fabric but the forms are appreciably different. The sherds of identical fabric recovered from the pre-pottery drying oven phase at Leacroft and the single sherd from the floor of the pot kiln might have come from either of these kilns or the Gypsy Lane kiln in Glapthorn and may represent movement of potters away from the centres of

production in the late 15th century as wheel production took over from the slower hand building of the previous era. The main dating evidence for the period when the Leacroft workshop was producing pottery can be summarised as follows:

1. Sherds of Cistercian Ware and 'Tudor Green' ware were recovered from the upper level of the floor layers and below the demolition rubble in the building/workshop associated with the kiln.
2. A worn silver coin of Elizabeth I (1583–1604) from the silt level over the demolished kiln and stoke pit.

'Tudor Green' ware has a wide circulation in the mid 15th century (Moorhouse 1979). The sherds found were only body sherds in a fine, untempered white fabric and may have come from Cheam, Kingston, Farnborough Hill or any other production centre. 'Tudor Green' proper first appears in London and Surrey c. 1380 and is still present at Farnborough Hill in the late 15th century kiln deposits. However it appears to be superceded by a more robust, yet still fine fabric which is termed 'Early Border ware' and is current from c. 1480–1550 (Jacqueline Pearce pers. comm.; Pearce and Vince 1988, 7–18 and 88–91; see also Holling 1977, 61–6). The Cistercian ware is perhaps the best indicator of the period of production at Leacroft. This type is considered a 'type fossil' of the late 15th and 16th centuries (Moorhouse 1974, 50) and its introduction has been attributed to the period between 1480 and 1490 (Le Patourel 1966, 162). No Late Medieval Reduced Ware was found on either site, even in contexts pre-dating the kilns. This type was common in the area as shown by a large collection found on site J at Lyveden from a context dated by coins to 1461–80. Fifteenth-century kilns at Higham Ferrers, dated between 1436 and 1467, were producing grey wares in a coarse sandy fabric (Hall 1974, 55–6) as were kilns at Flitwick, Bedfordshire, dated between 1375 and 1500, clay pits being mentioned in 1486 (Mynard *et al.* 1983, 55–6); Moorhouse (1974, 51–4) postulates that Glapthorn lies on the northernmost limit of Late Medieval Reduced Ware distribution and this would appear to support the observation.

Many forms from Glapthorn resemble Bourne D ware from Lincolnshire dated to 1450–1637 (Healey 1969, 108–9) and are also similar to those at Great Brickhill, Bucks (Beamish 1989, 90). The Glapthorn pottery falls well within a 15th-century Late Medieval Oxidised Ware tradition, examples of which have been found at numerous sites in the south-east Midlands, typified by a utilitarian range of pottery forms with oxidised surfaces and a

reduced core. This seems to be an oxidised equivalent of the Late Medieval Reduced Ware tradition (Paul Blinkhorn, pers. comm.). At Gobion Manor, Northampton, the 14th- to early 16th-century assemblage included Late Medieval Oxidised Ware and Cistercian ware (Denham 1981–2, 96). The Glapthorn material differs in that both oxidised and reduced wares are being produced; this is presumably deliberate as some forms occur only in a reduced fabric, for example Type 4 jars at Gypsy Lane (Fig. 15). The pottery shows infinite minute variations in rim form, although it is clear that the potters were capable of replication when needed, as for example with bung-hole jars which are identical in size and form. It seems that the potters had cornered the market in the locality between Stamford and Oundle; the pottery has a strong local distribution being found in large quantities in 15th-century contexts at Nassington, Southwick (Johnston *et al.* forthcoming), Fotheringhay, Glapthorn and Oundle (unpublished). A further clue to the dating may be the size of the ridge tiles. In 1477 an Act was passed setting the size at 13½ ins by 6¼ ins (159 mm × 343 mm; Salzman 1967, 230–31). The Glapthorn ridge tiles measure 19 ins by 7½ ins (489 mm × 190 mm); we can therefore assume that they were being produced before 1477. In summary it would appear from the present evidence that Glapthorn was in production in the second half of the 15th century which would accord with the documentary evidence cited above.

THE GYPSY LANE KILN

Geology and stratigraphy

The site lies on Blisworth limestone (Great Oolitic Limestone) with a covering of brown oolitic clay and limestone cornbrash. At some time during the 12th to 15th centuries a series of buildings was constructed, with shallow stone footings set onto the natural limestone bedrock. During the life of these buildings a marl pit was dug immediately to the south-west and was eventually partially backfilled with a mixture of small stone and clay building debris. The final phase of occupation occurred when the main rectangular building underwent a change of use as a potter moved in. The main part of the floor was dug out to foundation level and a kiln constructed within the building, the western half forming the west stoke pit. After the kiln went out of use the site lay derelict and seems to have persisted as a notable earthwork at least until 1614 where it is shown as a semicircle on an estate map (NRO Map 4526). There has been no further occupation on the site. A circular mound which stands 50 cm above ground level remains to the present day, accentuated by the hollow of the marl

pit. A Fluxgate Magnetometer survey of the area by Adrian Challands (unpublished) indicated only one kiln.

Although the authors had been aware of the existence of this kiln for many years, its excavation only became justified as recent farming techniques began to bring up more stone. Only the kiln phases were investigated because of the extremely dry conditions. Several exploratory trenches were extended to the road edges but no other outstanding features were found apart from one small patch of cobbling. This is not surprising as on most of the site the topsoil is only 20 cm deep and lies directly on bedrock.

The excavation

20 cm of topsoil was removed by machine, clearing an area 15 m × 15 m and revealing the stony outline of the kiln, with a darker ashy layer evident to the south-west sloping steeply downhill into the hollow of an earlier feature.

The kiln

The kiln had been set into the eastern end of a stone building (Fig. 7) which was aligned parallel with the road on an east/west axis and measured 8.80 m × 5.00 m. Only the north, east and west walls were visible, the southern wall being buried under a bank of clay and stone, with the black ash from the western stoke pit spilling over the southern part of the site for a distance of at least 10 m and dropping down into a steeper dip in the south-west corner of the site. A dense 5–10 cm thick layer of pot sherds surrounded the kiln, particularly thick to the south and east, extending out of the area of excavation. The western stoke pit was completely filled with ash, lime and pot sherds.

Kiln phases

Phase 1 (Fig. 7 and inset B)

In its earliest phase the kiln was constructed by digging out the sub-floor of the building setting the stone wall of the kiln on natural bedrock. The kiln was a horse-shoe shaped structure 3.4 m long and 3.6 m wide. On the north and east sides the walls were set into the existing wall of the building. Internally the kiln chamber measured 2.6 m long and 2.7 m wide; at this stage the pedestal is difficult to quantify as it had been destroyed by rebuilding; only the eastern back end showed a solid rounded base. The kiln had a large west stoke hole 1.58 m wide and of indeterminate length which was also largely destroyed during rebuilding and a small eastern stokehole 65 cm long, tapering in width from 70 cm outside to 40 cm internally. The rounded

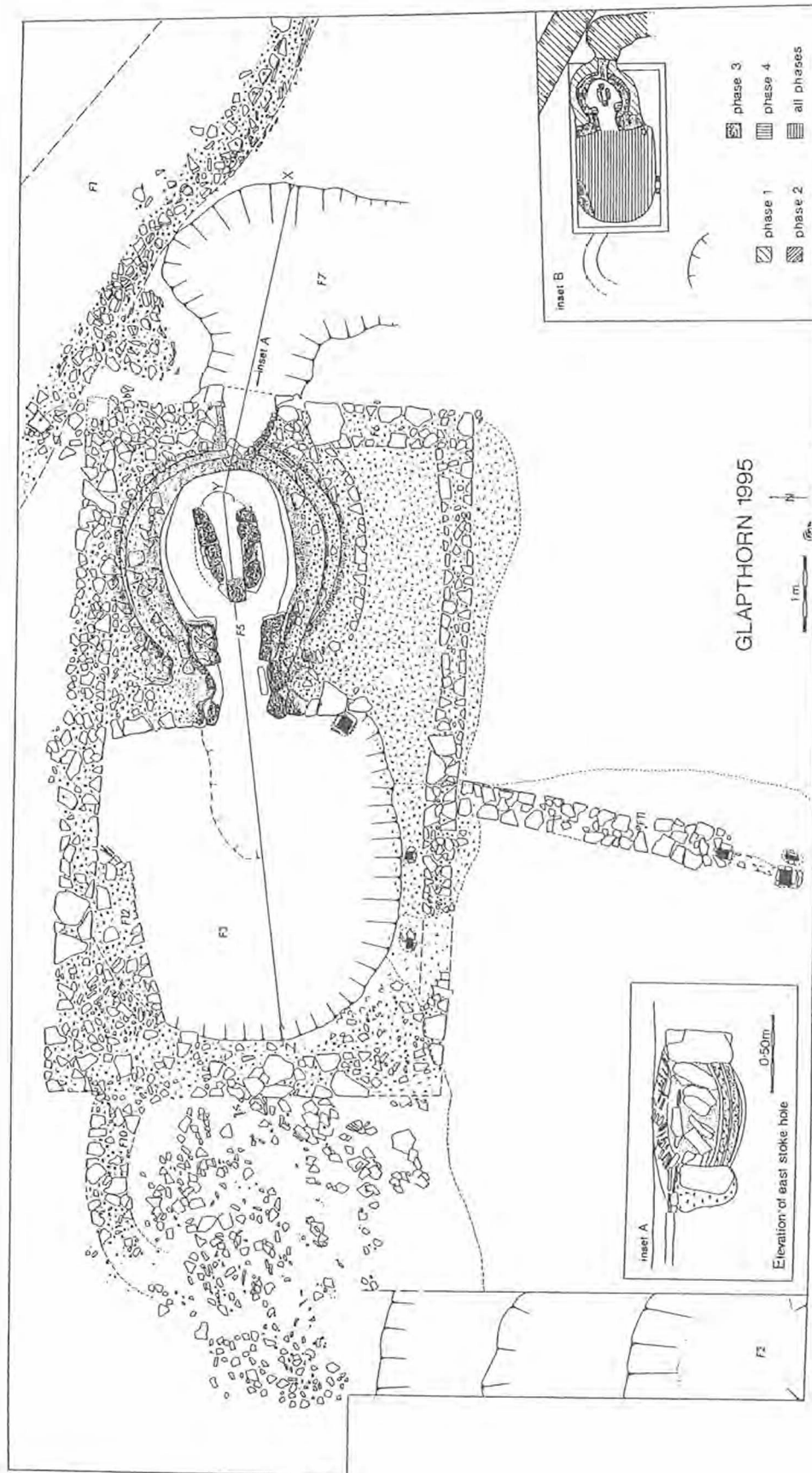


Fig. 7. Plan of Gypsy Lane kiln and associated buildings. Inset A – elevation of the east stoke-hole showing the tile arch. Inset B – Phases of kiln.

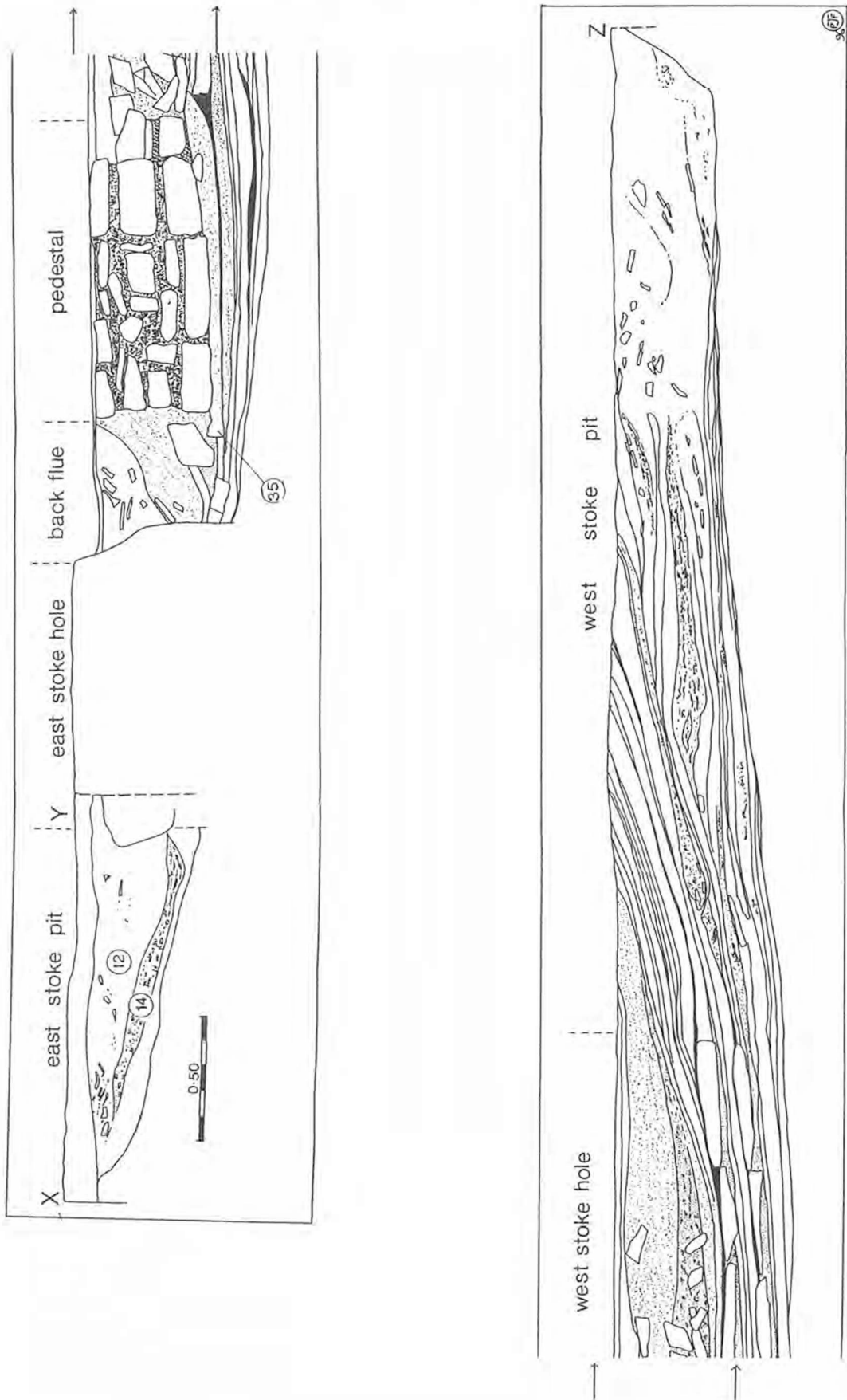


Fig. 8. Longitudinal section of Gypsy Lane kiln and stoke pits, showing lime layers. For context list see App. 3.

eastern arch (Fig. 7, inset A) had survived and was 45 cm high formed from (imported) clay tiles 1 cm thick, forming voussoirs starting half way up the side of the stoke hole. These tiles were very badly fragmented and had only survived because of the protection provided by some very large blocking stones used when this stoke hole went out of use. A layer of brown earth had filtered through and separated the tiles from the blocking stones and this had preserved the shape of the arch. The stoke pit at the eastern end (F7) cut into the natural clay, was 2.8 m wide, 3.0 m long and was entered from the south, the sides sloping steeply down to the north and east. At the stoking entrance its depth was 50 cm.

The western, main stoke pit (F3) comprised the other half of the building, measuring 3.8 m × 4 m, and may have been protected by the north and west walls of the building as no firing debris had been deposited on the other side of these walls. The base of the ash pit was formed by the natural stone bedrock.

The walls of the kiln were composed of small, flat, limestone rubble, averaging 15 cm × 10 cm × 8 cm, jointed with pale yellow clay; no evidence of an internal coating of protective clay was seen and the stones were burnt red to a depth of 8 cm with a white surface. In one place the wall was only 28 cm thick.

Phase 2 (Fig. 7, inset B)

In order to re-line the kiln chamber a layer of small, flat, limestone blocks, jointed with the usual pale yellow clay, had been built inside around the back half of the kiln, tapering from 20 cm on each side of the east stoke hole to nothing at the centre point. A new floor was put into the west stoke hole in the form of a flat slab of stone as layers rose inside the flue channels; this increased the length of the east stoke hole by 20 cm and produced internal dimensions of 2.65 m × 3.40 m. The flue channels contained a large amount of lime which had a hard surface crust.

At the end of this phase the eastern stoke pit contained 10 cm of charcoal, black ash and lime (Fig. 8, layer 14) with a small amount of fired clay fragments and pot sherds. The western stoke pit was full.

Phase 3 (Fig. 7 inset B, Fig. 8 and Appendix 3)

A radical change in size and shape occurred when the front facade was demolished and re-built. A bank of yellow clay flecked with burnt fragments of red clay and sherds of pot was built on the south side to support the facade. This covered the south wall of the building. The kiln was re-lined with stone and this re-lining varied in thickness between 20 cm and 50 cm, completely masking the east stoke hole. The internal dimensions were reduced to 1.6 m wide,

2.1 m long, narrowing towards the front with a stoke hole 70 cm wide and 80 cm long. The new lining walls had survived to seven courses of stone 50 cm high, and were built on top of 15 cm of accumulated lime layers.

The new pedestal consisted of two long oval platforms, 55–60 cm long, 25 cm wide and 45 cm high, constructed from limestone blocks, one a reused dressed stone with vertical tooling, resting on a 15 cm thick bed of hard lime deposit (Fig. 8, layer 85). The two platforms were closer together at the front with a separate 'nose' of stone joining them together and pointing to the kiln entrance. The clay jointing had been smoothed over somewhat on top of the platforms and was thought to represent the top surface. The east stoke hole was deliberately blocked with very large heat-damaged blocks of limestone packed beneath the arch. The east stoke pit was filled with pot sherds and small limestone rubble in a matrix of brown clay soil (Fig. 8, layer 12) and the area was levelled.

The west stoke pit was dug out and the debris thrown southwards down-hill over the scree of potsherds and small limestone rubble, extending into the redundant hollow of the earlier marl pit. A small retaining wall 36 cm high, built diagonally across the north-west corner of the stoke pit, may represent an attempt to repair a collapsing back wall (Fig. 7, F12). Three stone-reinforced post holes were found along the southern edge of the stoke pit cutting the bank of redeposited clay, but no corresponding features were identified on the other side.

Phase 4 (Fig. 7, inset B)

Two small cheek pieces were added to the internal corners of the west stoke hole, thus narrowing it to 60 cm and lengthening it to 1.4 m. The floor was raised yet again with more limestone slabs.

Layers in the kiln and western stoke pit (Fig. 8 and Appendix 3)

Firing continued until the flue channels were full to the top with grey ash. At some point these channels had been deliberately filled with very large, heavily burned limestone blocks similar to those used to block the eastern stoke hole. Their deposition had not caused any damage to the walls. The area between the two halves of the pedestal contained several chunks of fired clay luting. The final few firings were of pottery, and the final top layer was composed of fragments of red-fired clay.

The western stoke pit was filled to the top with clearly layered ash, lime and pottery debris. At least 19 layers could be traced into the kiln, but only as far as the internal entrance of the stoke hole, apart from the final layer which probably represents decay of the structure. The extremely dry conditions made

the excavation of separate layers impossible, the material being very dusty and difficult to clean adequately. The pit was therefore sectioned longitudinally and no attempt was made to number the layers.

Associated features (Fig. 7)

To the north-west of the building, a short length of ditch (F1), 2.22 m wide and 52 cm deep with an irregular unshaped profile, cut the natural clay. Only the top 22 cm of this ditch fill was associated with the kiln phases and had been packed with large sherds of pottery, tile and flat limestone lying pitched along the south edge. Nearer to the kiln wall an area of pitched limestone and yellow clay packing had been laid on top of the ditch fill and was associated with Phase 3, when the whole east side had been back-filled and levelled.

Pre-kiln features — the associated buildings (Fig. 7)

The building used by the potter to house his kiln was part of a complex of buildings, others of which had barely survived the plough. Those identified had been demolished prior to kiln building. A brief description is given, but no effort was made to excavate any further because of the extremely dry condition of the site.

The walls of the kiln building had survived to a depth of 35 cm on the north side cut into clay natural, and 25 cm to the south buried under the excavated material from the floor inside and later by the clay bank of the final kiln phase. The walls were only 50 cm wide, composed of small limestone rubble of a type and size consistent with the stone which lies close to the surface in this area. The south and east walls had either been pushed or had fallen over, slipping downhill in a small scree before the kiln was built.

DISCUSSION OF THE GYPSY LANE KILN

The earliest activity on site was that of clearance of an area of woodland in Bodger's Wood followed by the construction of a timber-framed building with stone footings which consisted of at least two conjoined blocks with a circular stone structure at the west end. The dating material from the floor of these buildings suggests a 14th- to early 15th-century date and a copper alloy buckle plate would support this. A similar buckle plate was found at Leacroft (Oakley 1979, 251; fig. 108 no. 31). These pre-kiln structures were not investigated further because of the constraints of time and dryness of the ground.

The circular stone structure may represent the base of a small dovecot, or more likely a placement

for a large steeping vat used to soak grain prior to brewing. A similar structure at West Cotton (Windell *et al.* 1990) was thought to be the latter.

In the late 15th century a potter moved into the village and adapted the buildings to suit his purpose. The south wing was taken down and the main rectangular building had its walls reduced almost to ground level, the smaller stones being pushed off all around the outside. The floor of the building was almost completely dug out and the kiln incorporated into the north and east walls, leaving the western half of the floor as a large stoke pit. The spoil from digging out the floor was cast over the remnant walls to the south and east. The east stoke hole was cut through and tiles brought from elsewhere to form an arch. The east stoke pit was dug out of the natural clay with an entrance from the south. The circular stone structure may have remained standing.

The kiln was initially much larger than when firing ceased and would have taken a load roughly twice as large. As with the Leacroft kiln, its structure suggests a truncated tower with an open top which would have been strong enough to support a ladder, which could therefore have been loaded both from the top and through the west stoke hole.

The kiln had been modified twice; the front had been rebuilt and the whole kiln re-lined, effectively blocking the east stoke hole which was filled in with very large heat-damaged stones. The stoke pit was filled in and all the area east of the building was then levelled. The pedestal was redesigned, presumably to improve the flow of heat through the flue channels. No evidence was found for seating of kiln bars, but the pedestal was considered to have survived to full height. Both the re-lining and the new pedestal were founded on 20 cm of earlier encrusted lime and pot layers.

The west stoke pit had been completely emptied when the facade was rebuilt. This created a large area of black ash and pot sherds which spread downhill and into the hollow of the old marl pit. Three stone-reinforced post holes along the south edge of the west stoke pit would have provided support for a roofed structure which would serve the functions of keeping fuel and potter dry and also reducing the wind to the fire mouth; a high wind can create disastrous results, particularly in simple updraught kilns. No matching post holes were found at the other side of the pit so it is assumed that a sleeper beam was used, perhaps resting on the remains of the north wall. Evidence for a protective cover for the firemouth was also found at the Donyatt potteries (Coleman Smith and Pearson 1988, 78). As with the Leacroft kiln, no evidence was found for a cover over the kiln itself.

As the layers in the kiln and stoke pit rose, extra floors were added in the stoke hole in the form of large flat stones. The final modification had the effect

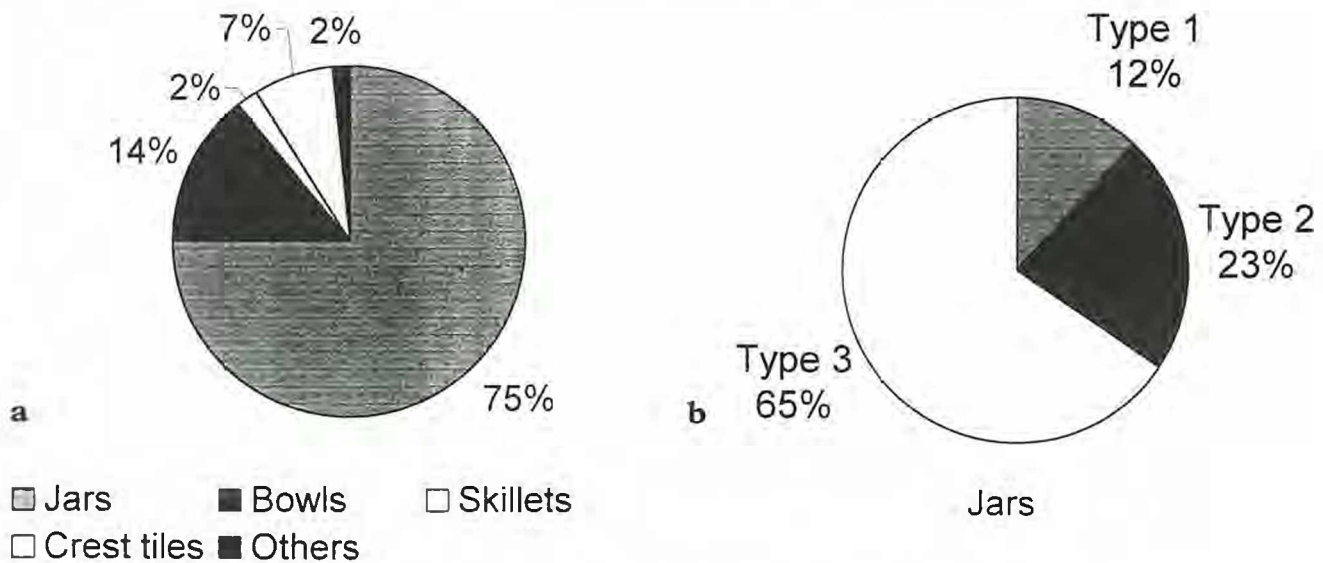


Fig. 9. Percentages of forms from the Leacroft kiln.

of lengthening the stoke hole; perhaps the sides had been badly damaged by heat as, unlike at Leacroft, no clay lining was ever used in this kiln.

The layers in the kiln posed several problems: it appeared that the flue channels had been deliberately filled with very large heat-damaged stones down the sides and firing had continued when the channels were full up to the top of the pedestal. This accords with the Leacroft kiln and also a medieval kiln excavated at Stanion (Bellamy 1983a, 154). Throughout its life the kiln had been used to fire both pottery and tile or lime. The west stoke pit was mainly filled with ash and lime — more than nineteen layers were counted in the final fill (Fig. 8), but it must be remembered that this pit had been emptied during the rebuilding. The majority of the pottery wasters had been thrown around the outside of the kiln building to the north, east and particularly the south, where a 15 cm-thick layer of sherds completely covered the ground for a distance of at least five metres.

After the kiln was abandoned there was no real attempt to demolish it; rather it was allowed to remain as part of the landscape in an area of the village which itself was becoming deserted — 120 years later an early 17th-century estate map shows an un-named semi-circular feature. Ploughing has always presented difficulties and the walls of the building have saved the kiln from the worst effects of modern farming. The kiln has now been protected by an extra mound of soil.

GYPSY LANE — THE DATING EVIDENCE

The striking similarities between the two kiln sites and the almost identical pottery produced make it

probable that both sites were in production at around the same time. The Gypsy Lane kiln is likely to have been the first, producing a wider variety of vessel types including plain flat roof tiles, decorative wall tiles and plain floor tiles which were not found at Leacroft. The pottery recovered from the clay floor of the demolished adjacent building immediately below the first layer of potsherds discarded from the kiln consisted of hand-made Stanion/Lyveden type pottery (Bellamy 1983b, 56; fig. 3) and included two jug handles of buff oolitic limestone tempered fabric with a rich apple-green glaze, a rouletted sherd of the same fabric with a speckled green glaze (No. 14) and one sherd with a more common decorative technique of painted white slip bands with grid-stamped pellets (No. 12). In addition there was a glazed base sherd of Developed Stamford ware (Paul Blinkhorn pers. comm.). A medieval buckle plate with a walked scorper design (not illustrated) recovered from the same context is thought to be current from the mid 14th to early 15th centuries (Oakley 1979, 251).

These finds put this kiln into the same date range as Leacroft. The documentary evidence cited could relate to either kiln.

PART II — THE POTTERY

POTTERY FABRIC DESCRIPTION FOR LEACROFT AND GYPSY LANE.

The fabric and treatment of the pottery is the same on both sites and is therefore described only once. Approximately 30% of the pottery recovered from each site, many very large sherds averaging 150 mm × 100 mm, appears to have been used to cover the

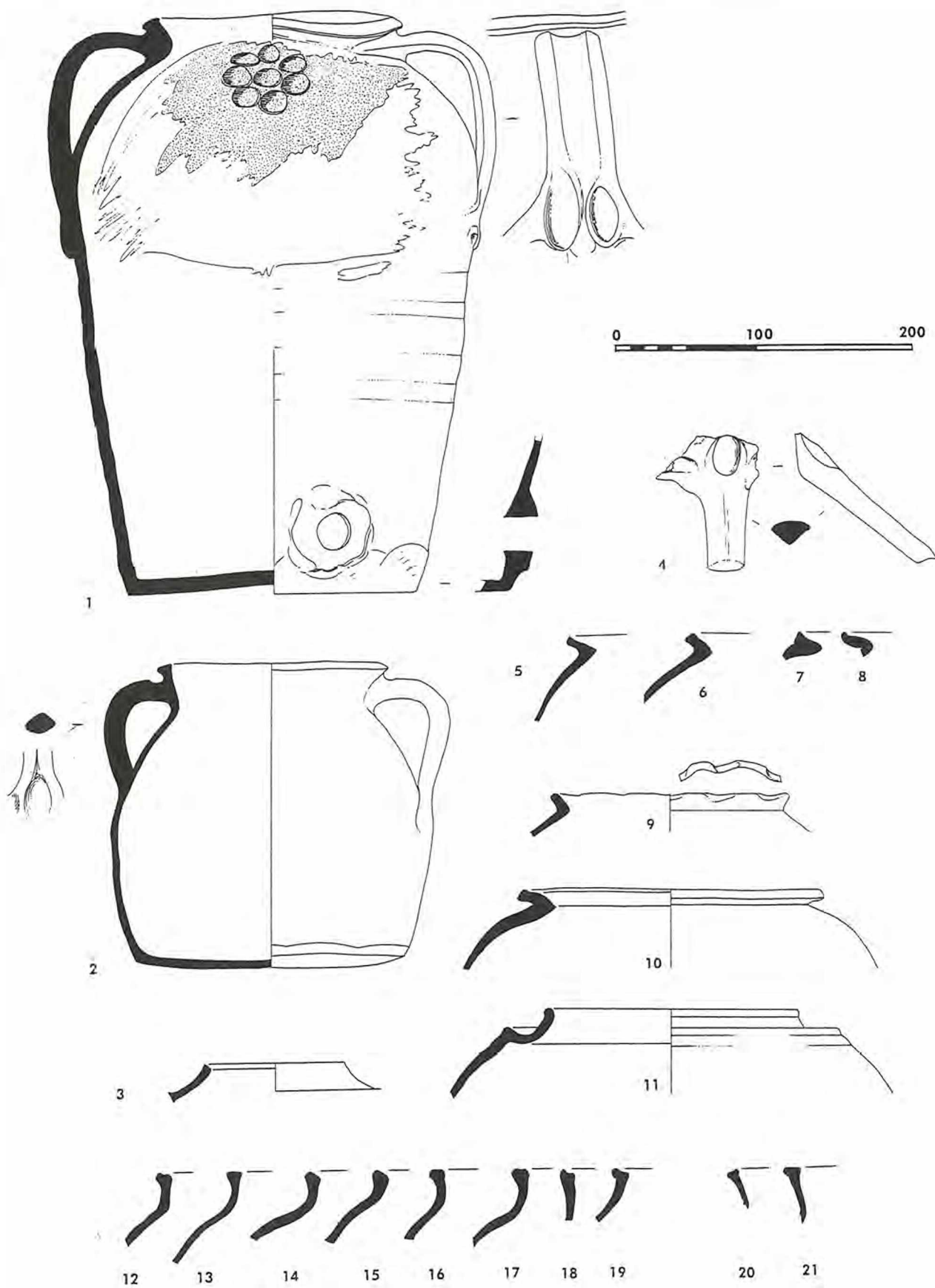


Fig. 10. Pottery from the Leacroft kiln. Nos. 1-21, scale 1:4.

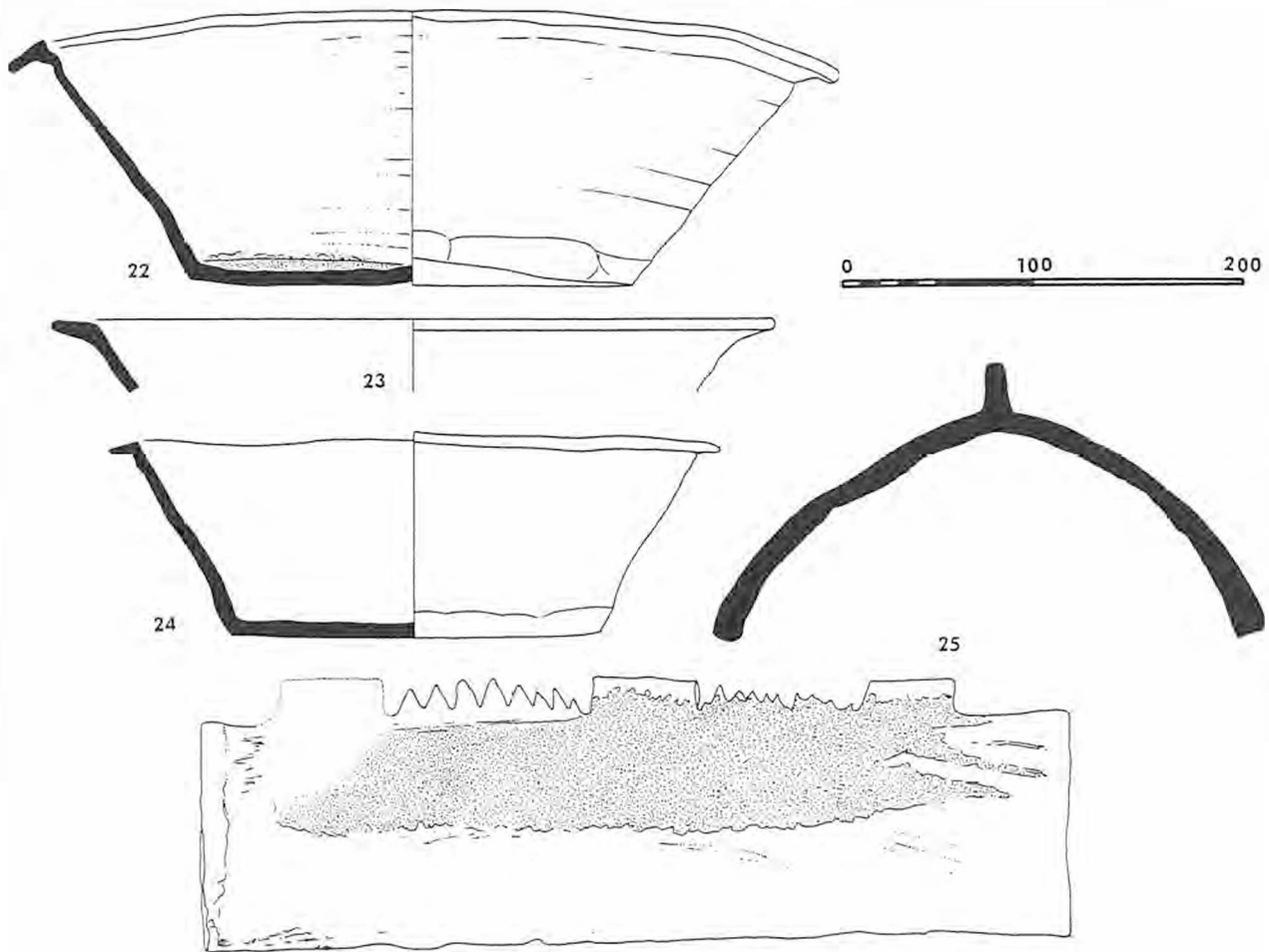


Fig. 11. Pottery from the Leacroft kiln. Nos. 22–25, scale 1:4.

load during firing. These sherds are not considered representative of the marketable material as they have been fired more than once and tend to be dark grey (Munsell 2.5YR 4/0), overfired and covered in lime.

The pottery is hard with a rough feel and fracture, tending to break into large sherds with square corners. When examined at $\times 20$ magnification it has abundant, well sorted temper of sub-rounded, white quartz grains measuring 0.25 mm–0.5 mm, with occasional dark red ironstone fragments. The surface is often smoothed over, partially covering the temper and giving the surface a 'goose-flesh' appearance.

The pottery is mainly oxidised orange (Munsell 2.5YR 6/6 to 7.5YR 7.6) often with a dark core (Munsell 10YR 6/1). All pots are wheel-thrown with knife-trimmed flat bases. A throwing rib is often used on larger vessels (see Fig. 6), the rib being held against the outside of the rotating pot with one hand whilst the other hand raises the clay from inside; this gives a smooth outer surface with finger ridges inside. Throwing ribs are still used by craft potters today. The ribs show evidence of wear on the end which would occur as a result of trimming the base of the pot against the wheel-head prior to removal.

Surface decoration is limited to a thin, creamy white slip, either poured over or slopped on. Many vessels appear to have undergone flash reduction leaving the bare surface a streaky orange-grey. A plain lead glaze is used either over the slip or on its own. When used without slip and reduced, the glaze is a dark olive green (Munsell 5Y 4/4). Less often the glazed pottery is oxidised and the resulting glaze is orange (Munsell 2.5YR 5.56/8). Where the glaze is applied over slip the results vary from a clear pale yellow (Munsell 10YR 8/4) to a lustrous green (Munsell 5Y 8/4); presumably the green effect occurs because the slip contains some iron and/or the iron in the body can bleed through the thin slip coating. Very occasionally the potter has used copper in the glaze and this produced a speckled green effect.

LEACROFT — THE POTTERY

Approximately 1,282 kilos of pottery was recovered from the excavation. Although full quantification and analysis have not yet been possible, all rims were examined, and the relative frequencies of forms (Fig. 9A) and of jar types (Fig. 9B) were calculated from the rim sherd count.

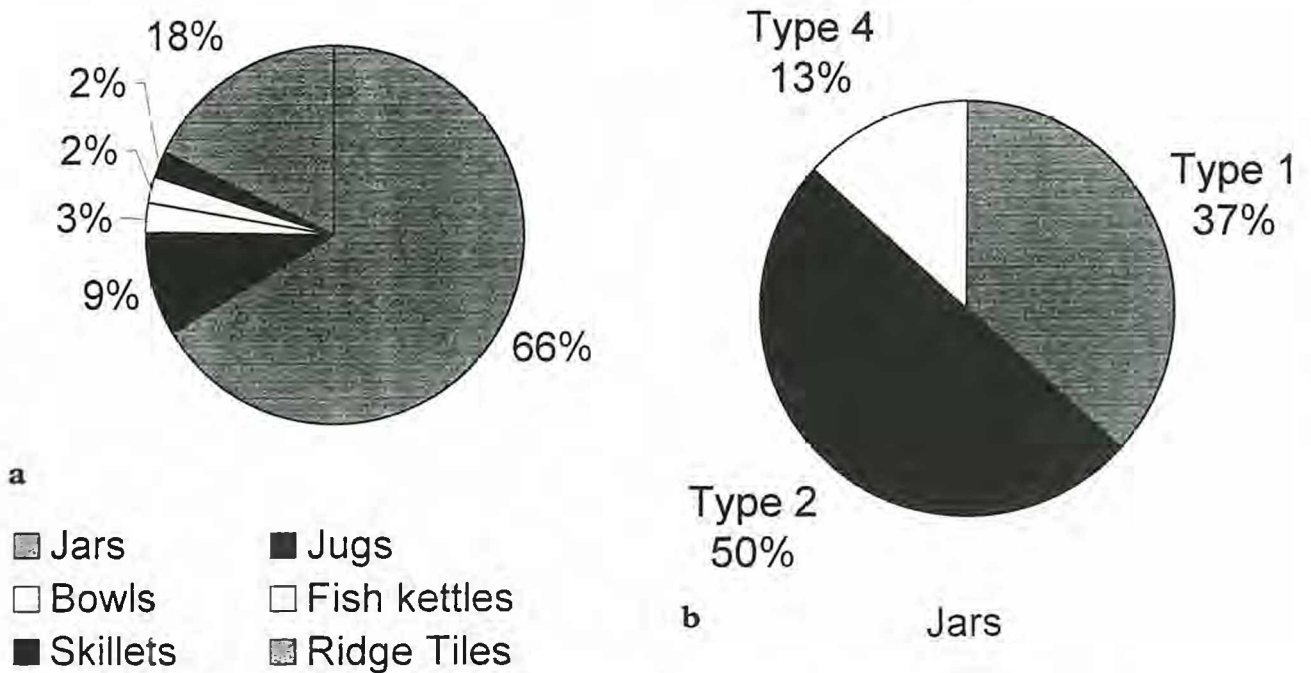


Fig. 12. Percentages of forms from the Gypsy Lane kiln.

All pottery is wheel-thrown and knife-trimmed, with flat-bases including bung-hole jars, a wide variety of sizes of flange-rimmed bowls, large upright-rimmed jars, flange-rimmed jars and crested ridge tiles.

Forms

Jars (Figs. 9B and 10)

Vessels have been divided into three sub-types:

- Type 1: Bung-hole jars.
- Type 2: Jars with everted rims.
- Type 3: Jars with straight-sided necks.

Type 1 (Fig. 10, No. 1)

Bung-hole jars. Several almost complete jars were recovered from the workshop area; these vessels were a standard 410 mm high with a rim diameter of 160 mm. Decoration is confined to an applied floral motif on the shoulder formed from a thumb pad of the same clay as the body and this is covered by a splash of slip sealed by a green speckled glaze. The bung-hole is also a separately applied piece of clay and is 22 mm in diameter formed over a plug. Some vessels are oxidised orange and others reduced grey with no apparent consistency, although there does seem to have been an effort to produce reduced ware in this form.

After reconstruction the capacity of these jars was 20.35 litres, measured by lining them with a plastic bag and filling with water. These were thought to

be 'useable' wasters, perhaps for use in the workshop.

Type 2 (Fig. 10, Nos. 5–10)

These jars have a wide mouth with an everted rim; rim diameters vary between 140 mm (No. 5) and 260 mm (No. 8). All are oxidised orange apart from No. 10 which has a heavily reduced core and only very light surface oxidation giving a light brown effect.

Type 3 (Fig. 10, Nos. 2, 3, 11–21)

All jars have a fairly upright wide neck with rim diameters varying from 100 to 180 mm, with the majority 140–180 mm (Nos. 12, 14, 16–17, 20–21), with upright rims which are slightly thickened, sometimes with a slight indent on the top; Nos. 20 and 21 have incised lines cut into the base of the neck; No. 15 has a patch of slip and glaze on the shoulder; Nos. 15 and 16 have handles arising just below the rim and may be bung-hole jars; No. 9 is unusual in having a thumb pad rim. Numbers 3 and 11 may be distilling bases. Number 2 is complete and has a dark grey unglazed reduced surface.

Bowls (Fig. 11, Nos. 22–4)

All bowls have flanged rims with diameters ranging from 200–500 mm. The fabric is oxidised throughout although No. 24 has a streaky grey brown surface showing some reduction. No. 22 has a white slip which has been swilled around inside the base, covered by the remnants of a thin speckled, green glaze. The bowls held 17 litres, 8.4 litres, 4.77 litres

and 2.14 litres, measured as the bunghole jars. Ten restorable bowls were recovered from the workshop; all are wasters but may have been saved as useful 'seconds'.

Ridge tiles (Fig. 11, No. 25)

Ridge tiles are crested with applied knife cut crests and are plain or slip-decorated or glazed; crests vary along the length of the tiles and no set pattern is obvious. Tiles are very large, measuring 470 mm × 180 mm; all are formed on sand and stabbed on the under-surface.

Handles (Fig. 10, Nos. 1, 2 and 4)

Handles consist mainly of bold flat strap handles with two or three thumb indents at the base. Less common are handles with a round section (No. 2) and skillet handles (No. 4).

Kiln furniture (not illustrated)

Twenty fragments of clay fire bars, hand-formed from the same clay as the pottery, were recovered. These measure 210 mm wide × 40 mm thick; no measurement of length was possible.

Pottery from earlier contexts (not illustrated)

Areas A and B — quarry fill.

A total of 396 sherds (7.03 kilos) of pot was recovered from the quarry fill which pre-dated all activity on site. The date range for this residual material covered the period *c.* 1150–1400 and included seven sherds of late Stamford ware and three sherds of Romano-British pottery. The remainder were of Lyveden/Stanion type shelly wares with one stamped and glazed jug.

Area B — pre-kiln building.

The pre-kiln phases of this area produced 285 sherds (2.15 kilos) of shelly Lyveden/Stanion ware of 12th- to 14th-century date (Webster 1975, 60–76 and 88–95) two small body sherds of 'Tudor Green' ware and one sherd of Cistercian ware.

GYPSY LANE — THE POTTERY

The following report is a preliminary survey of the material only. Approximately 2,032 kilos of potsherds were recovered from the excavation, but other material was present beyond the excavated area. Every tenth rim sherd was included in the limited quantification to arrive at the relative frequencies of forms (Fig. 12a) and of jar types (Fig. 12b). The report which follows is based on that sample.

The fabric is identical to that of the Leacroft kiln (see above p. 31).

Although the forms are very similar to those at

Leacroft, their variety is greater. This may in part be a reflection of the longer use of the kiln, but it may also be that the Gypsy Lane kiln was the first and main producer, with Leacroft as an off-shoot or even a sub-contractor.

The pottery consists mainly of large bowls with everted rims, large and small jars with knife-trimmed flat bases and crested ridge tiles. Impressed, applied, floral motifs occur on the shoulders of bunghole jars, and exclusive to Gypsy Lane are jars with thumb impressed cordons just below the rim. A similar decorative technique in a sandy fabric but with a sagging base is seen at Olney Hyde, Buckinghamshire (Mynard 1984, fig. 8 no. 82). This is considered to be in the full medieval tradition with a date range from early to late 14th century. Nearly all handles are secured at the bottom with two or three large thumb indents. Only two flat roof tiles were recovered, one of which was 7½ inches (190 mm) wide and ½ in. (15 mm) thick. As with the crested ridge tiles, the size does not conform to the 1477 Act (Salzman 1967, 00) which required a measurement of 10½ × 6¼ × 5/8 ins thick (240 mm × 160 mm × 16 mm) It is interesting that the tiles are being produced with both round and square holes, the latter becoming the norm in the later Middle Ages (Ian Betts, pers. comm.). The 15th-century tile kiln at Lyveden was producing flat roof tiles in a fine oxidised sandy fabric (Steane 1975, 95). In the Glapthorn area, locally-produced Collyweston stone slates or thatch appear to have been the norm as very few sites produce tiles in any quantity. The two tiles here reported may represent a small order, for example for repair to a farm building.

The decorative wall tiles are the surprise element: only four were found but all are wasters and can safely be attributed to the kiln. The *sgraffito* technique was fairly common on pottery in the early 14th century. The well-known Tring *sgraffito* wall tiles are thought to date to the first half of the 14th century but unfortunately their provenance is unknown (Eames 1980, 61). No parallels have been found for the Glapthorn tiles which are rather primitively executed using a technique which was out of fashion by the late 15th century.

Forms

Bowls (Fig. 13, Nos. 26 – 41)

All bowls have flanged rims apart from No. 40; No. 41 was very rough and hand-made. Rim sizes vary between 124 mm and 328 mm. Bowls are oxidised throughout apart from Nos. 31, 38, 40 and 41 which were lightly reduced externally with a reduced core and oxidised interior. Internally, Nos. 31 and 32 are glazed green over a white slip.

THE EXCAVATION OF TWO LATE MEDIEVAL KILNS WITH ASSOCIATED BUILDINGS

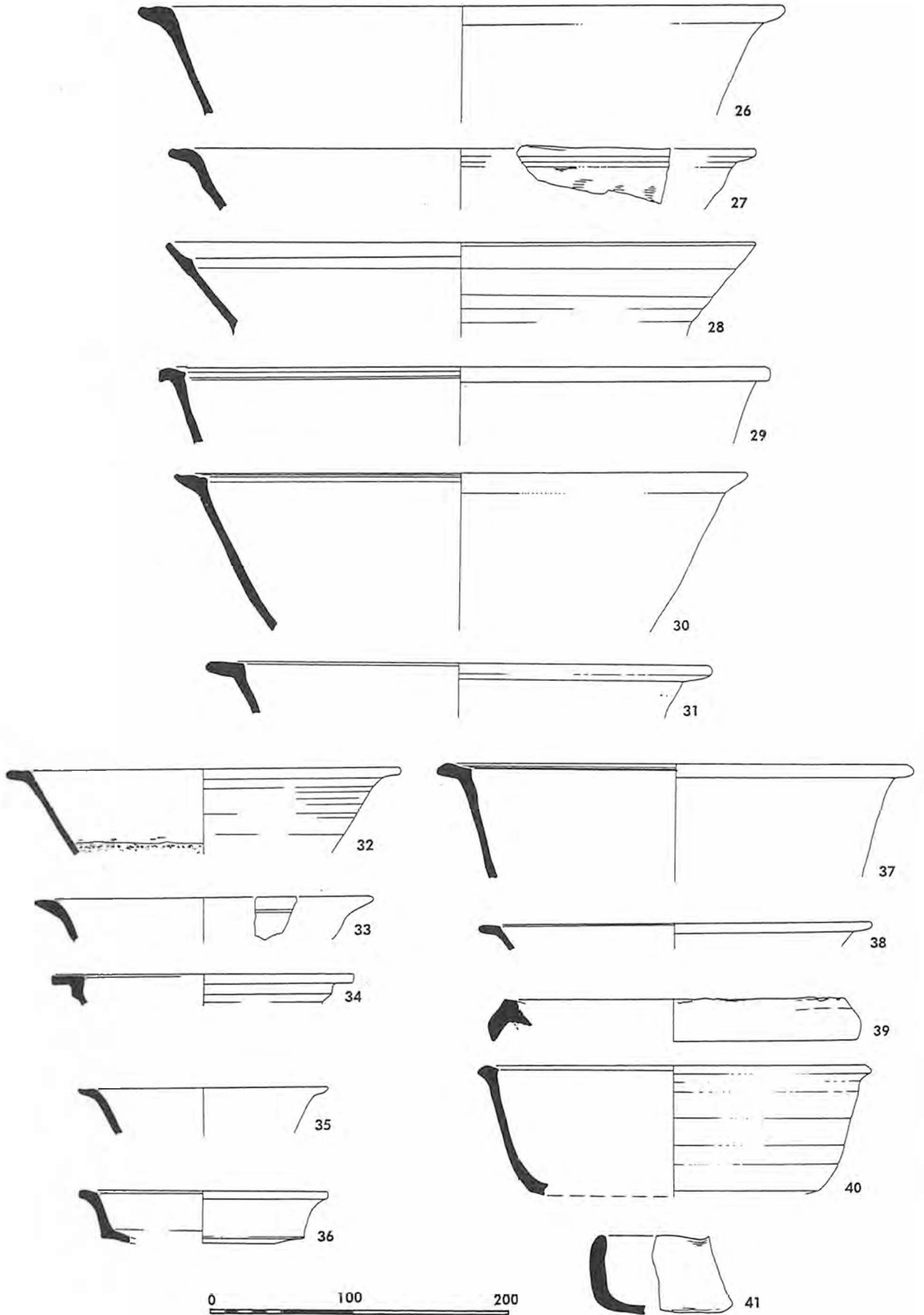


Fig. 13. Pottery from Gypsy Lane kiln. Nos. 26-41, scale 1:4.

THE EXCAVATION OF TWO LATE MEDIEVAL KILNS WITH ASSOCIATED BUILDINGS

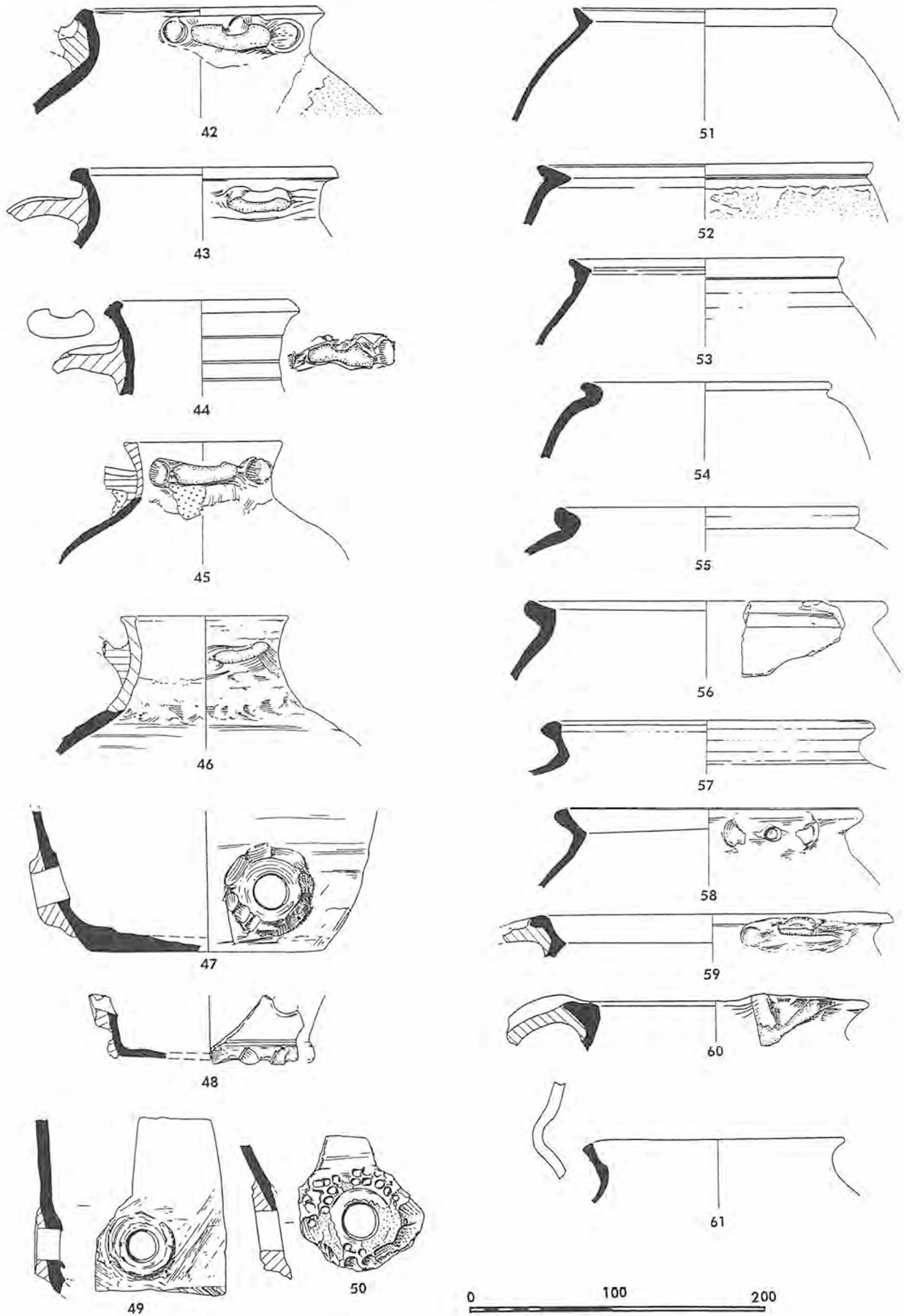


Fig. 14. Pottery from Gypsy Lane kiln. Nos. 42-61, scale 1:4.

THE EXCAVATION OF TWO LATE MEDIEVAL KILNS WITH ASSOCIATED BUILDINGS

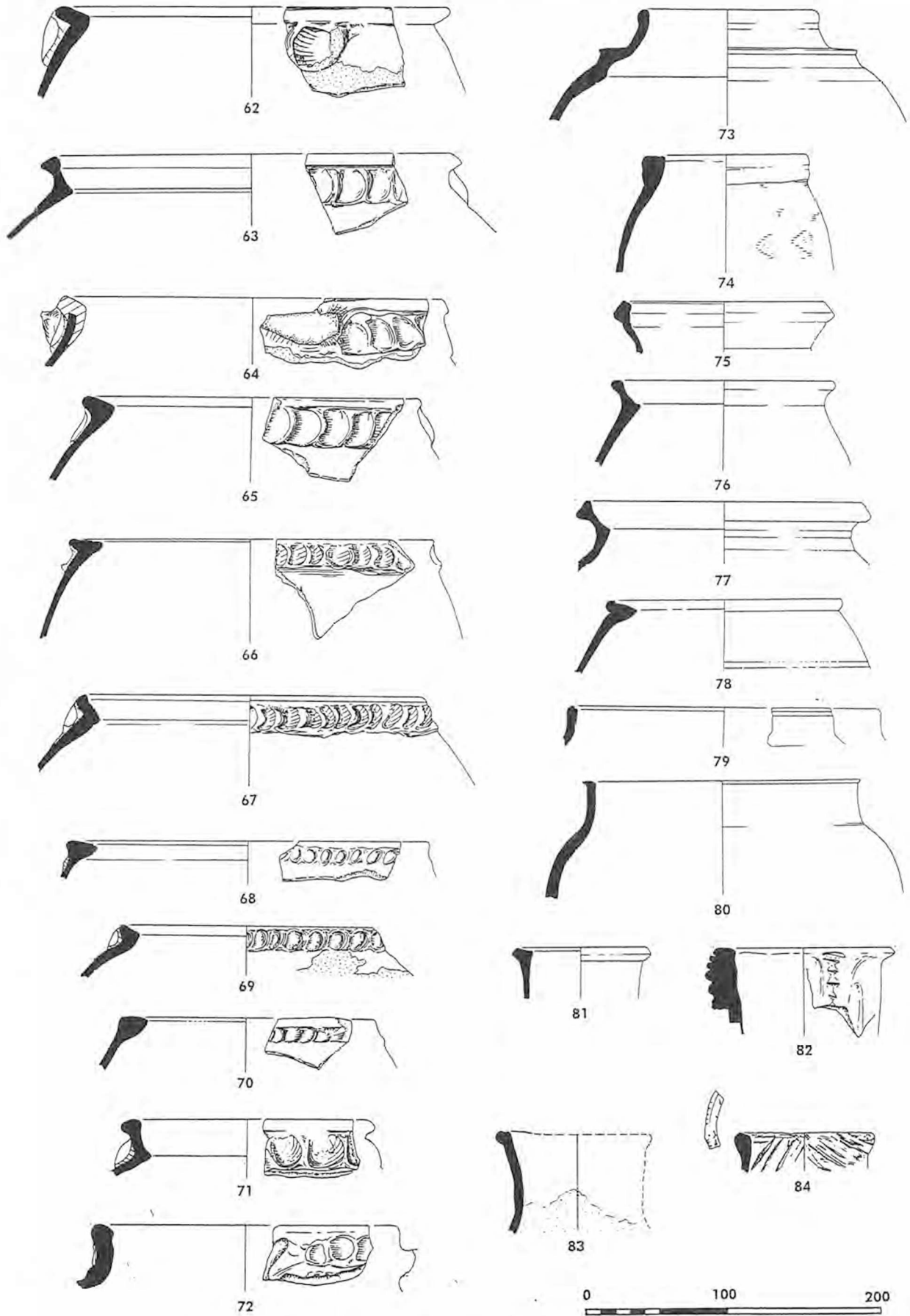


Fig. 15. Pottery from Gypsy Lane kiln. Nos. 62-84, scale 1:4.

THE EXCAVATION OF TWO LATE MEDIEVAL KILNS WITH ASSOCIATED BUILDINGS

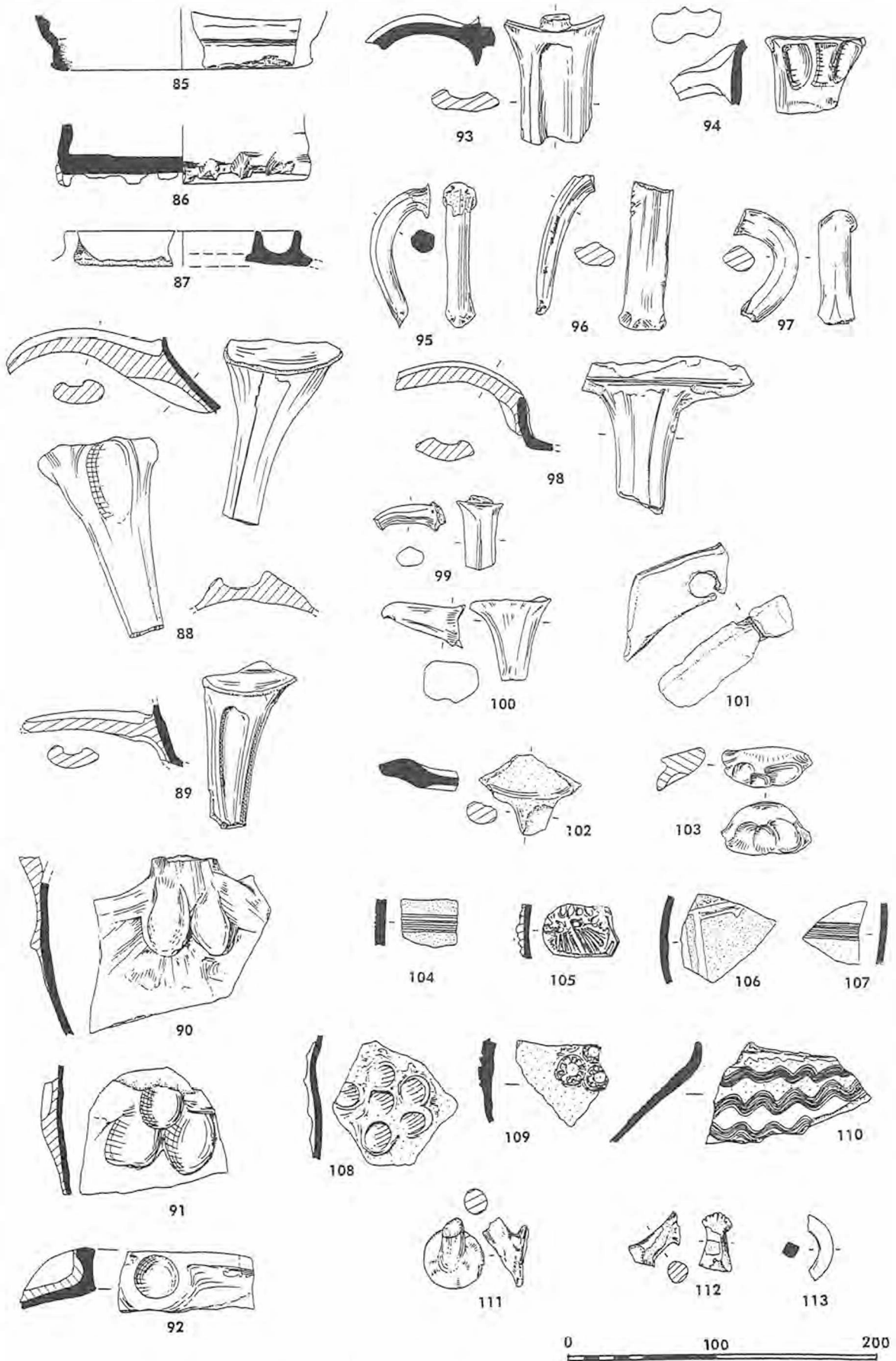


Fig. 16. Pottery from Gypsy Lane kiln. Nos. 85-113, scale 1:4.

Jars

There is little consistency in rim form. Jar forms present include Types 1 and 2 as at Leacroft (see above, p. 32); there are no examples here of Type 3, but instead a fourth type not found at Leacroft.

Type 1: Bung-hole jars, as Leacroft Type 1.

Type 2: Jars with everted rims and no decoration, as Leacroft Type 2.

Type 4: Jars with thumbed cordons below the rim.

Type 1 (Fig. 14, Nos. 42-43 and 47-50)

These are considered to be bung-hole jars on the basis of their similarity to the complete jars found at Leacroft (Fig. 8, No. 1) and although no complete profiles were recovered, floral motifs and bung-holes, as at Leacroft, were very common in the assemblage. The bung-holes (Nos. 47-50) were 22-25 mm in diameter and have a smooth bore perhaps formed over a stick or perforated with one. The hole is reinforced by adding a separate piece of clay to the vessel, both are perforated together and a variety of patterns used to smooth over the joint. One jar (No. 48) also has a thumbed base. Vessels are oxidised or reduced with a patchy green glaze over a splash of white slip on the shoulder which covers the floral motif.

Type 2 (Fig. 14, Nos. 51-61)

Rim diameters vary between 80 mm and 166 mm. The vessels are unglazed and mainly oxidised orange. Nos. 58-60 have strap handles arising directly from the rim; No. 58 shows that the handle was plugged into the rim (see also Fig. 16, Nos. 93 and 99). No. 61 has a spout.

Type 4 (Fig. 15, Nos. 62-72)

Rim diameters vary between 121 mm and 210 mm, most being at the larger end of the scale. All have a separately applied thumbed cordon below the rim. No. 64 has a handle. Nos. 62, 66, 69 and 71 are decorated with a green speckled glaze over a white slip. Unglazed areas are generally grey.

Other possible jars (Fig. 15, Nos. 73-80)

Other forms do not fit into any neat category. No. 73 may be a distilling base and is similar to one from Leacroft (Fig. 8, No. 11).

Jugs Fig. 14, Nos. 44-46 and Fig. 15, Nos. 81-84

Only one vessel, No. 83 has a spout and it is glazed green. No. 84 is unglazed with an excess of rough scoring on its external surface. Nos. 44-46 which may be bung-hole jugs, have a wide strap handle and are green glazed over a patchy white slip. No. 82 has an applied nicked strip down the side of the neck.

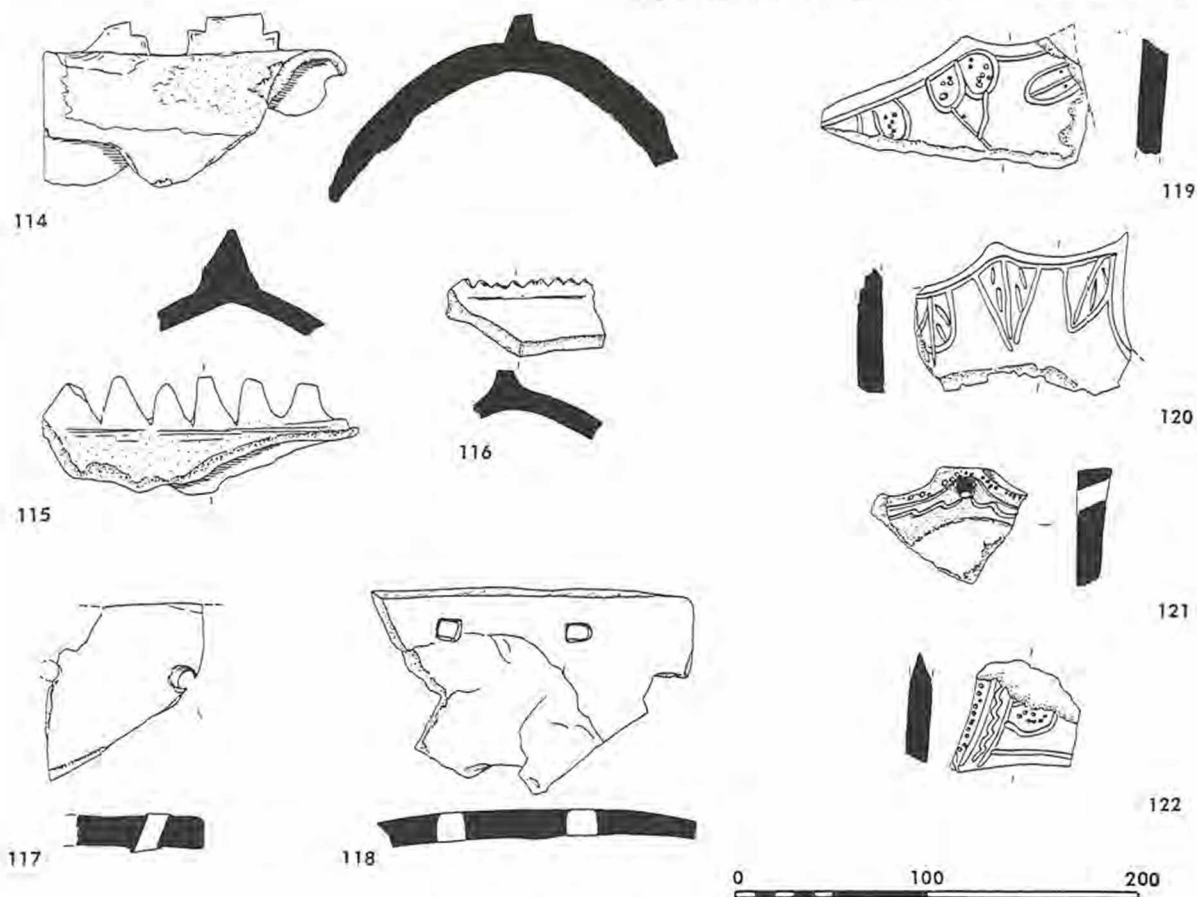


Fig. 17. Pottery from Gypsy Lane kiln. Nos. 114-122, scale 1:4.

Bases (Fig. 14, Nos. 47-48 and Fig. 16, Nos. 85-87)
All bases are flat and most are knife-trimmed. No. 85 is untrimmed and Nos. 48 and 86 are roughly thumbed. Many bases show wipe marks where the potter has smoothed the clay after trimming. No. 87 may be a chicken feeder (Jacqueline Pearce, pers. comm.).

Handles (Fig. 16, No. 88-102)

Handles Nos. 90-91 and 92-95 are pulled strap handles which are plugged into the rim of larger vessels, in particular bung-hole jars, and finished with two or three large thumb indents to secure the bottom of the handle to the pot. Less common are smaller handles with rounded section (Nos. 95-97) none of which were found attached to pots. No. 88 is a skillet handle and No. 98 is from a dripping dish; Nos. 101 and 93 have a thumbed attachment for lifting, formed from an added piece of clay. There is a costrel handle (not illustrated) with a white slip and a clear glaze and has been trimmed with a knife. The impression of the side joint of the bottle is visible on the connecting surface of the handle.

Decoration (Fig. 16, Nos. 103-109).

All sherds are glazed green apart from Nos. 108 and 109 which have a clear glaze and appear orange. Nos. 104 and 108 have applied stamped pellets of clay; No. 108 is stamped into the wall of the pot. No. 110 has wavy horizontal combing.

Unidentified (Fig. 16, Nos. 110 and 111)

A possible foot from an aquamanile, No. 111, was slipped and glazed olive green.

Tiles (Fig. 17, Nos. 113-121)

Ridge tiles (Nos. 113-115)

All the ridge tiles were formed on sand and stabbed on the under surface. The knife-cut crests come in a great variety of shapes and sizes; only the main structural elements are illustrated. The tiles are generally reduced and have a splash of white slip on the upper surface covered with glaze which may be green or clear.

Flat roof tiles (Nos. 116-117)

The tiles were formed on sand and have either round or square peg holes and are 12 mm thick. No. 116 is plain and No. 117 has a white slip on the upper surface.

Decorative tiles (Nos. 118-121)

The tiles, which are all wasters, are 12-15 mm thick, with their edges knife-cut and chamfered on the rear angle; only No. 118 was formed on sand. Nos. 118 and 121 are obviously too thin to be floor tiles and the angled suspension hole in No. 120 would suggest

that it was made to hang on a vertical surface. Nos. 118 and 119 seem to be identical in size and shape. The front surfaces of Nos. 118, 119 and 121 have been painted with a white slip, through which the pattern has been cut and stabbed with a blunt-ended stylus, to reveal the red clay body beneath in a rather primitive *sgraffito* technique. No. 120 has been slip decorated around the perimeter only, after the pattern was cut. Nos. 118 and 121 have a lead glaze which is underfired; No. 119 has a clear lead glaze, changing to green where thicker. No. 120 is unglazed.

Floor tiles (not illustrated)

Ten incomplete, undecorated, lead-glazed tiles formed a small part of the assemblage. These were 30 mm thick, with vertically cut sides and formed on sand, and were all wasters.

Kiln furniture (Fig. 16, No. 112)

A single ring of clay with a deliberate slip coating may represent a spacer used during firing.

Ten fragments of fire bricks (not illus.) probably to span the flue channels to form a floor, were recovered. These were made from the same fabric as the pottery, were wire cut and were a standard 50 mm thick, 100 mm wide and at least 150 mm long.

Pottery from earlier contexts (not illustrated)

A total of 46 sherds (1.7 kilos) of Lyveden/Stanton type medieval shelly ware of 12th- to 14th-century date was recovered from the pre-kiln layers. There were at least 10 vessels, including a stamped and slipped jug in white oolitic limestone tempered fabric with a rich, speckled, green glaze and two handles of the same type (Paul Blinkhorn, pers. comm.).

LIME BURNING

Both kilns in this report were also used for firing lime; indeed some of the earliest firings seem to have been for this purpose, although the initial firings were of pottery. Walter Brassbrygge was not an itinerant potter as he is known to have rented two cottages in the village. The manufacture of pottery is not suited to a cold wet climate for two reasons: the difficulties of drying pots in damp weather and that of getting the high temperature needed to fire them when the weather is cold. Traditionally, potters dug clay in winter and then left it to weather and age to increase its malleability. It is not too large a step to dig limestone, even perhaps at the same time as clay, as both lie close together in the parish; this would give the potter an additional income. Firing

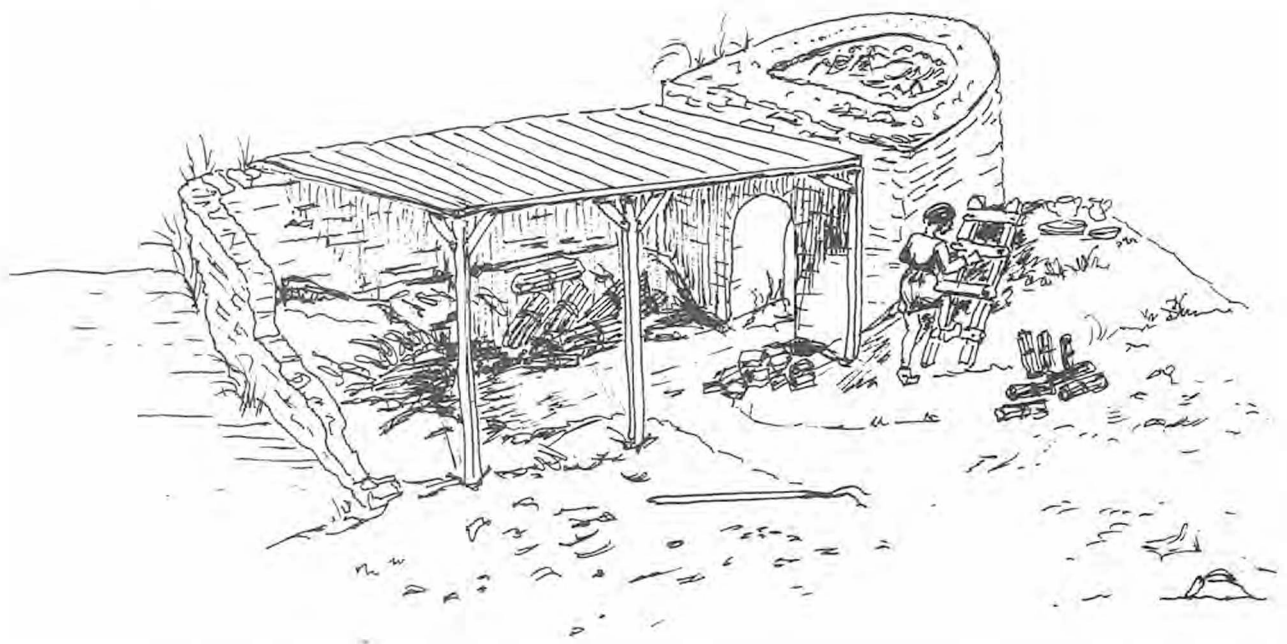


Fig. 18. Artist's impression of the Gypsy Lane kiln in its final phase.

lime in the winter would help prevent deterioration of the kiln structure from dampness. Another possibility is that the potter took orders for lime whenever requested. This would explain the alternating layers of pot and lime seen in both kilns.

During lime burning the load or 'charge' of stone is mixed with the fuel, the stone being put in as equal-sized lumps of raw limestone; the fuel, in this case charcoal, was made from slowly grown hazel, oak and ash coppices. As the fuel burns and converts the stone into lime, the ash and charcoal fall down through the spaces in the load onto the floor of the flues, followed by a powdered lime from the surface of the blocks of stone. The converted limestone remains whole until it is slaked before use, although further dust falls as it is removed from the kiln. This layering of charcoal and lime was in evidence throughout the firing life of both kilns. Samples of the different lime layers were analysed and proved to be calcium carbonate with varying amounts of iron. Some samples which were 5–10 cm thick contained fragments of unconverted or partially converted limestone.

The east stoke holes may have been designed to assist in the ignition of fuel in lime burning. Two lime kilns of the late 16th or early 17th century excavated at York were of a similar size and shape with opposing stoke holes (Holling 1977, notes 99–100; figs. 1 and 2).

A pot firing following a lime burning resulted in sherds which fell into the flue channels being

covered in lime; much of the pottery from the stoke pits was encrusted with lime.

The accounts book for the Duke of Buckingham's manor in 1483 mentions pits dug for limestone during repairs to the manor house (NRO Bru Bxiii 15, 19v). This may have been for building stone or for lime burning to provide lime for mortar, plaster for floors and walls, or as a wash for walls of houses and agricultural buildings. Lime as a fertilizer was not yet in common use, marl being the alternative (Williams 1989, 6). Lime burning produces a caustic quicklime which needs to be slaked with water before use. Unslaked lime has been used to sterilise burials of infectious carcasses in cases of Anthrax.

As far as is known there are no other reports of dual purpose kilns; this may just not have been recognised or the lime may have been mistaken for ash.

ANALYSIS OF LIME DEPOSITS by Derek Jones

In order to confirm that the white material was lime and not ash, four samples from the Leacroft kiln were collected and analysed using hydrochloric acid, by the author, a chemist based at Prince William School, Oundle. The calcium carbonate content of the samples varied between 70% and 90%. Sample 4 contained lumps of unconverted limestone mixed with the powder. This would suggest that the lime

is not derived from the conversion and flaking of the kiln walls.

CONCLUSION

These excavations add to the evidence for the setting-up of new potteries away from existing centres of production, in the late 15th century in north-east Northamptonshire, when both tenements in Glapthorn may well have been vacant and ruinous if the population had still not recovered from the decline of the previous century. An artist's impression of the final phase at Gypsy Lane is shown in Fig. 18. The kilns operated in the full regional 15th-century tradition, producing wheel-thrown utilitarian pottery for use in brewing, dairying and baking, and largely replacing the hand-made cooking pots and jugs of the previous era. In addition to hollow wares and crested ridge tiles, small batches of peg tiles and floor tiles may have been made to order. The *sgraffito* wall tiles were unexpected and no parallels have yet been found for them. Quicklime was produced regularly in the kilns without any detriment to the fabric. This is the first clear evidence in this country for dual-purpose use of pottery kilns.

Acknowledgements

The authors would like to thank the owners, Jenny and Dick Smith (Leacroft kiln) and Mr Bruce Wilkinson (Gypsy Lane kiln) for their kindness and cooperation; without their help and encouragement the work could not have been carried out. In addition we are indebted to Northamptonshire Heritage, the Nene Valley Research Trust and the Middle Nene Archaeological Group for advice and financial support. In particular we would like to thank Mr Tim Halliday for his help with the transcription of documents and Mr Adrian Challands for carrying out the Fluxgate Magnetometer surveys. Artwork is by P. J. Foster. Stephen Moorhouse kindly read part of this paper and his comments have been included. Anna Slowikowski, Paul Blinkhorn and Jacqui Pearce all provided much helpful advice. Mark Robinson provided the report on the organic material from the drying oven and Mr D. Elzinga recorded the levels. The authors would also like to thank Beverley Nenck and Ian Betts for their advice on the tiles and David Whitehorn, Mark Holmes and pupils from the Prince William School Oundle for their assistance with the excavation. All finds have been deposited in Oundle Museum.

BIBLIOGRAPHY

- Audouy, M. F. A. forthcoming, *North Raunds, Northants. Excavations 1977-87*, English Heritage Monograph series.
- Beamish, H. F. 1989, 'A medieval pottery production site at Jack Ironcap's Lane, Great Brickhill', *Records Bucks* 31, 88-92.
- Bellamy, B. 1983a, 'Medieval pottery kilns at Stanion', *Northamptonshire Archaeol* 18, 153-159.
- Bellamy, B. 1983b, 'Later Medieval Pottery from Stanion' *Northamptonshire Archaeol* 18, 159-161.
- Bryant, B. F. and Steane, J. M. 1969, 'Excavations at the Deserted Medieval Settlement at Lyveden', *J Northampton Mus and Art Gallery* 5, 3-15.
- Bryant, G. F. and Steane, J. M. 1971, 'Excavations at the Deserted Medieval Settlement at Lyveden', *J Northampton Mus and Art Gallery* 9, 7-47.
- Coleman Smith, R. and Pearson, T. 1988, *Excavations in the Donyatt Potteries*, Phillimore, Chichester.
- Denham, V. 1981-2, 'The Pottery' in J. H. Williams and C. Farwell, *Excavations in the Riding, Northampton in the area of Gobion Manor, Northamptonshire Archaeol* 19, 96.
- Eames, E. S. 1980, *Catalogue of Lead-Glazed Earthenware Tiles in the Department of Medieval and Later Antiquities British Museum 1*, British Museum Publications, London.
- Hall, D. N. 1974, 'Medieval pottery from the Higham Ferrers Hundred, Northamptonshire', *J Northampton Museum and Art Gallery* 10, 55-6.
- Healey, R. H. 1969, 'Bourne Ware', *Lincolnshire Hist Archaeol* 4, 108-9.
- Holling, F. 1977, 'Reflections on Tudor Green', *Post-Medieval Archaeol.* 11, 61-6.
- Hurst, J. G. 1962-3, 'White Castle and the Dating of Medieval Pottery', *Medieval Archaeol.* 6-7, 135-155.
- Johnston, A. G., Bellamy, B. and Foster, P. J. forthcoming, 'Excavations at Southwick, Northamptonshire, 1996-7', *Northamptonshire Archaeol.*
- Leach, B. 1971, *A Pottery's Book*, Faber and Faber, London.
- Le Patourel, H. E. J. 1966, 'The Pottery', 269-70 in P. Mayes and E. J. Pirie, 'A Cistercian ware kiln of the early 16th century at Potterton, Yorks', *Antiq. J.* 46, 255-76.
- Moorhouse, S. 1974, 'A Distinctive Type of late medieval pottery in the eastern Midlands: A Definition and Preliminary Statement'. *Proc. Camb. Ant. Soc.* 65, 46-59.
- Moorhouse, S. 1979, 'Tudor green, some further thoughts', *Medieval Ceramics* 3, 53-61.
- Musty, J. W. G. 1974, 'Medieval pottery kilns', in V. Evison, H. Hodges and J. G. Hurst (eds.), *Medieval Pottery from Excavations: Studies Presented to Gerald Clough Dunning*. London, 41-65.
- The Munsell Book of Color*, 1969, Munsell Color Co., Baltimore.
- Mynard, D. C. 1980, 'A Tudor pottery kiln at Woodnewton, Northants' *Northamptonshire Archaeol* 15, 160-62.
- Mynard, D. C. 1984, 'A Medieval Pottery Industry at Olney Hyde', *Records Bucks* 26.
- Mynard, D. C., Petchey, M. and Tilson, P. 1983, 'A medieval pottery at Church End, Flitwick, Bedfordshire', *Bedfordshire Archaeol J.* 16, 75-84.
- Oakley, G. 1979, 'The Copper Alloy Objects' in Williams, J. R. 1979, *St Peter's Street, Northampton*, Northampton Development Corporation. 250-251.
- Pearce, J. E. and Vince, A. G. 1988, 'A Dated Type-series of London Medieval Pottery Volume 4: Surrey Whitewares', *London Middlesex Archaeol Soc Spec Pap* 10.
- Rickett, R. J. 1985, 'The Brewhouse and Bakehouse at Grafton Regis, Northants' *Archive of Northants Heritage*.
- Robinson, M. in prep. 'Excavations at Grove Priory, Bedford', archive report in Luton Museum.
- RCHME 1984, *An Inventory of Architectural Monuments in North Northamptonshire*, HMSO, London.
- Salzman, L. E., 1967, *Building in England down to 1540*, Oxford University Press.

THE EXCAVATION OF TWO LATE MEDIEVAL KILNS WITH ASSOCIATED BUILDINGS

- Slater, V. R., 1979, 'The Plant Remains', in F. R. Williams, 'Excavations on Marefair, Northampton, 1977', *Northamptonshire Archaeol* 14, 38-79.
- Steane, K. 1975, 'The tiles' in Steane and Bryant 1975, 27-82 and 91-2.
- Steane, J. M. and Bryant, G. F. 1975, 'Excavations at the Deserted Medieval Settlement at Lyveden, 7', *Northampton Museum and Art Gallery* 12, 27-92.
- Webster, P. A. 1975, 'The Pottery' in Steane and Bryant, 1975, 60-76 and 88-91.
- Williams, R. 1989, *Limekilns and Limeburning*, Shire Publications, Aylesbury.
- Windell, D., Chapman, A. and Woodiwiss, J., 1990, 'From barrows to bypass', *Excavations at West Cotton, Raunds, Northants. 1985-1989*, Northampton.
- Young, D., 1979, 'The Verwood Potteries', *Proc Dorset Nat Hist Archaeol Soc.* 101, 103-20.

*Church Farmhouse
Glaphthorn
Peterborough,
PE8 5BE.

**22 New Road
Geddington
Kettering
Northants.

APPENDIX 1

Glaphthorn Leacroft (Figs. 3 and 4, sections A-B and C - D)

Layers in the kiln and stoke pits

- 1 Topsoil
- 4 Pot, tile, burnt stone and burnt clay
- 10 Clay and pot
- 11 Orange brown clay, pot and tile
- 12 Plug of flat limestone blocking east stoke hole
- 14 Red burnt clay and brown soil
- 15 Yellow/brown clay, charcoal, pot and tile
- 17 Collapsed stone and clay
- 18 Pot, tile, red soil and charcoal
- 19 Bank of yellow clay
- 20 Fired clay, stone, pot and kiln bar
- 21 Dirty friable lime, pot and tile
- 24 Clean lime layer
- 25 Hard yellow concreted lime, pot and tile
- 26 Pot, ash and charcoal
- 27 Sandy lime
- 28 Hard lime

Résumé

Deux fabriques de poteries et tuiles du bas moyen-âge comprenant des fours et d'autres bâtiments associés, qui furent découvertes à Glaphthorn (Northamptonshire), ont produit les premiers vestiges de fours à double fonctions. Ces fours furent utilisés pour brûler de la chaux entre deux cuissons de poterie.

- 29 Charcoal, pot and tile
- 32 Brown earth, charcoal, red fired clay, burnt stone and pot
- 33 Brown earth, yellow clay, lime, charcoal and pot
- 36 Dirty lime, pot, tile, brown earth, charcoal and ash
- 39 Hard lime
- 47 White soft lime
- 50 Modern layer with black cinder
- 54 Brown soil and pot
- 60 Burnt stone
- 61 Charcoal, pot and tile
- 63 Yellow gritty lime, pot and tile
- 67 Pot, charcoal and lime
- 68 Lime and pot
- 69 Pot and tile
- 70 Thin lime layer
- 74 White lime
- 75 Pot, tile, charcoal and dark earth
- 84 Wall
- 95 Limestone rubble floor of kiln

APPENDIX 2

Glaphthorn Leacroft (Fig. 5)
Section across associated building

Layers

- 100 Workshop demolition rubble
- 108 Floor packing
- 107/121 Clean orange clay
- 107/110 Black ash
- 111 Drain
- 118 Black ash
- 120 Burnt stone
- 137 Dark soil
- 138 Orange clay

APPENDIX 3

Glaphthorn Gypsy Lane (Figs. 7 and 8, sections X-Z)

Layers

- 12 Yellow brown clay soil, limestone fragments, pot and tile
- 13 Charcoal, black ash, lime, pot and tile
- 35 Lime

Zusammenfassung

Zwei, mittelalterliche Stätten zur Herstellung von Töpferware und Ziegeln mit dazu gehörenden Gebäuden, die in Glaphthorn, Northamptonshire, gefunden wurden, erbrachten zum ersten Mal den Beweis für die Existenz von Brennöfen mit doppelter Funktion, in denen Kalk zwischen verschiedenen Töpferei-Brennvorgängen gebrannt wurde.

Nachweis von auf der Grenze zwischen Surrey und Hampshire hergestellter sogenannter "Border Ware" aus dem frühen 16ten Jahrhundert in London