

# THE EXCAVATION OF A MOTTE AT LODSBRIDGE MILL, LODSWORTH

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*Summary.* This report describes a small motte apparently built in the 13th century. After temporary occupation the top was heightened and a light palisade may have surrounded the motte top at that time. Impressions of crosstrees were found in the centre, presumably for some structure above. Finds favour, but do not prove convincingly, this as a windmill base c.1700. Alternatively, the crosstrees might represent the base of a small central tower or look-out platform put up in the 13th century.

## INTRODUCTION

The excavations were undertaken for two weeks in 1964 by the Brighton and Hove Archaeological Society at the invitation of the owner, Mr. Evelyn de Rothschild, who afforded every facility for the work and generously bore the cost of the expense involved.

*Topography* (Fig. 1). The motte lies towards the southern end of Lodsworth parish on its western side, a few yards from the boundary with Selham parish. Geographically it is closer to Selham village which is  $\frac{1}{4}$  mile south, whereas Lodsworth village is  $\frac{1}{4}$  miles north. The National Grid Reference is SU 93372103: 6in. O.S. Map 22 SW. The site is midway between Petworth and Midhurst and 1 mile south of the main road joining the two towns. The mound is situated in the grounds of Lodsbridge Mill, once a watermill, now a private residence. The River Rother, which served the mill, flanks the north-west side some 50ft. below the top of the motte, where the river has cut down, leaving a wide stretch of alluvium westwards towards Midhurst. A small stream joins the Rother close to the south-west side of the motte. A narrow road bends around the east side of the motte to cross a small late-18th century bridge, Lods Bridge, 260 yards to the north-west. Northwards, the land rises gradually, and there are extensive views to Chanctonbury Ring in the east, westward to the Hampshire Downs, while the escarpment of the South Downs is 3 miles to the south.

*Geology.* The bedrock in the vicinity of Lodsbridge Mill is the Selham Ironshot Sands, a lenticular formation locally present in the Lower Greensand. These strongly cross-bedded ironstained sands consist of predominantly medium-grained quartz sand with a varying content of polished black limonitic grains and scattered pebbles up to  $\frac{1}{4}$ in. across of vein quartz and 'lydites.' Ramifying veins and concretionary masses of iron pan of secondary origin are also

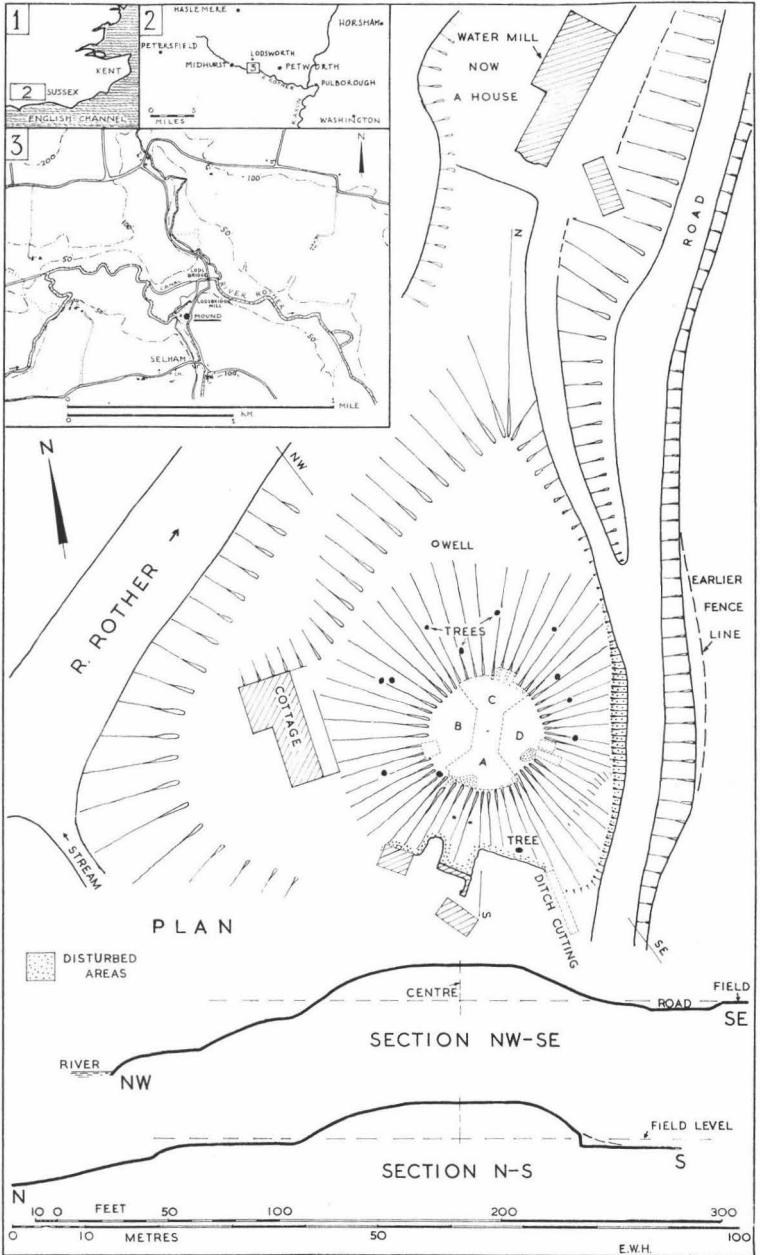


FIG. 1. Site Plan (upper left). Plan and Sections of Motte

characteristic of the deposit.<sup>1</sup> The mound is composed of this sand, which varies in colour here from purplish-brown to yellowish-brown, although it is generally orange-brown. In a section through the ditch on the south-eastern side of the mound and also at a modern disturbance on the south side, river terrace gravel (shown as 'valley gravel' on the published Geological Survey New Series lin. Chichester (317) Sheet) is present: 15-18in. of gravel overlies a thin layer of yellowish sand, with more gravel of unproved thickness below. All of these are naturally occurring deposits undisturbed by man except where the quarry ditch has been dug.

*History.* Few useful historical details of the site have been forthcoming. The present title deeds of the Mill property go back only to 1909 when the owner was Sir W. D. Pearson (Cowdray Estate). The mill land seems to have been a small property on its own not forming part of the farms on either side, and there appear to be no records of leases with helpful descriptions. Estate maps have proved useless, with one exception, that of a coloured map of Fitzlee Farm (in W. Sx. C.C. Record Office), dated 1629, showing the southern part of Lodsworth parish. This map shows the mound, called 'Lodg Mill Hill,' with a house close to its west side. No structure is indicated on top of the mound and the watermill itself would be below the border of the map. The house, which is likely to have been the miller's cottage, still exists, and has a 16th century appearance. The map shows the narrow road passing the east side of the mound, but the confluence of the small stream and the river is drawn rather more westerly.

Domesday Book records a mill in Lodsworth, which is suggested to be on the site afterwards occupied by a mill on the Rother where the river divides this parish from Selham.<sup>2</sup> The Selham tithes in 1241 included 5s. for a mill and in the 15th century it seems (as Seleham mill) to have been given to the Hospital of St. John. This may be the Lodsbridge mill, although the latter is in the parish or Liberty of Lodsworth, yet right on the border of Selham parish. Lodsbridge mill is mentioned by Holinshed in the 16th century and the Cowdray Estates in 1763 included 'a message and water-corn-mill called Lodgebridge Mill in Lodsworth,' and in 1822, 'Lodge Bridge Mill.' In the Cowdray Estate Act of 1805 it is included in the properties which could be sold, described as 'Lodgebridge Mill in Lodsworth,' let at £50 a year. It is shown and called 'Lodgebridge Mill' in maps of 1795 and 1813. The present structure probably dates from the 18th century and was in use as a watermill until some time in the 1930's.

*The Motte* (Fig. 1). The mound, or motte, basically is a truncated cone with a bottom diameter of c.130ft. and a somewhat oval flat

<sup>1</sup> D. W. Humphries, 'The Stratification of the Lower Greensand of the South-West Weald,' in *Proc. Geol. Assn.*, vol. 75 (1964), pp. 39-61 (see p. 52).

<sup>2</sup> *Victoria County History, Sussex*, vol. 4 (1953), p. 73.

top at 86ft. O.D., with axes of *c.*53ft. and 47ft. Measured from the flat field level to the east, the mound is *c.*16ft. high, but it appears 3-4ft. higher from the road, which is below the field level. The east side of the mound has been cut back recently during road widening and the south face has suffered damage from small buildings and a timber and coal yard. The ground to the west has been landscaped into two steps falling towards the river. A triangular area to the north is not likely to be a bailey, but seems to be the product of landscaping at some time in the past. The well in this flat area is steined with *c.*17th century brickwork. Coniferous trees are present on the slopes of the mound, but the grass-covered top was clear, apart from some scrub, in 1964. Despite the acidity of the sand, the topsoil had been worked by worms, a few of which were seen in the top 6in. of soil. A war-time slit trench dug in Quadrant D and a hollow in the perimeter in the south-west part of Quadrant A were the only signs of damage to the top. There was no footpath or other means of easy access up to the top of the mound. The disturbances in Quadrant A might represent the top of an earlier access, but erosion, modern damage, trees and heavy undergrowth on the south side prevented investigation. There are no traces of earthworks in the field to the east and air photographs showed no archaeological features apart from the motte.

The mound was constructed in part from a quarry ditch discovered at the south-east side and presumed on the east and south. The natural fall of the land down to the river on the west and north-west possibly inhibited the use of a ditch at those points. It was not possible to examine the lawn north of the mound. The remaining sand required could have come from the landscaped parts of the mill plot.

### STRUCTURAL SEQUENCE

Two periods or phases are indicated:—

*Period 1* (Figs. 3 and 4). The mound was erected to within  $3\frac{1}{2}$  to 4ft. of its present surface. Two hearths were utilised on top and some pottery was broken. Some clayey sand in the shape of a letter L appears to have been deposited on top and was trampled flat. Specks of charcoal, presumably blown from the hearths, were on this clayey layer. The delay between Periods 1 and 2 was insufficient for any turf to form.

*Period 2* (Figs. 2 and 4). The mound was heightened by at least  $3\frac{1}{2}$  to 4ft. of sand and the hearths were covered. Either at this time or subsequently, a palisade or fence was erected near the edge of the top, roughly circular in plan, averaging 47ft. diameter. Crosstrees for a superstructure were laid down. Two dogs were buried between the depressions of the crosstrees on the south and

west sides. The preservation of the bones suggest that the burials were not made in medieval times.

### DATING EVIDENCE

The upper 5ft. of the mound between the centre and Hearth 2, to within 6in. of the surface, contained 13th century pottery. The deeper central cutting then became barren of finds. Cuttings in Quadrants A and C were sterile at 4ft. down (Figs. 2, 3 and 4). Similar wares, bases and rims appeared throughout the deposits, glazed wares being remarkably sparse. A fair quantity of late-17th to early-18th century pottery was found in the upper 12-14in., some sherds dating to c.1550-1600 in the crosstrees depressions (and two sherds at about the same level not in the crosstrees). There was a total absence of 14th and 15th century wares. A few 19th and 20th century finds were just below the turf. The small number of metal finds below the top layer fall within the 12th or 13th century.

### THE EXCAVATIONS

*Method of Excavation.* It was intended to strip the whole of the top of the motte, but owing to the depth of sand removed, two quadrants were required for dumps, there being no other places for the excavated soil. Quadrants A and C therefore were connected by a 12ft. wide cutting. Shovels imported from Holland, which have a flat base and sharp cutting edge, were used for skimming down the sand an inch at a time, after the removal of the turf. This method was most successful in permitting changes of colour in the sand to be seen where postholes or other features occurred and trowelling was resorted to only when finds were made. Such postholes or features were outlined with matchsticks pressed vertically into the soil immediately they were discovered, but the colour did not disappear or fade upon exposure. (The doubtful postholes outside the perimeter of Quadrant D are discussed later). On completion the cuttings were refilled and the turf relaid. An old watermain iron key, c.2ft. long was inserted below the turf in place of the centre (estimated) survey peg. The latter was about 15in. north of the centre of the crosstrees depressions.

No ditch was apparent, but there was one place on the south-east side where a cutting was possible without damaging paths or lawns, and a 4ft. wide trench, 30ft. long was sunk there. The road apparently follows the line of the ditch on the east side.

*Ditch* (Fig. 4). The trench had been dug to a maximum depth of 6ft. 9in. without reaching the bottom, when the loose material on the north-east side collapsed, making further digging unsafe, and the trench was refilled. After removing wall foundations, a cobbled

floor, pit fillings and other disturbances of post-16th century date, in which a little late pottery was recovered, sandy gravel was exposed at each end of the trench. This layer had been cut through when the original ditch was excavated. The 4ft. of brown sand which had eroded from the mound into the ditch contained no finds. The red-brown sand below the brown sand, which was equally barren, appears to have been derived from the yellow ochre coloured natural sand layer beneath the gravel and which had deepened in colour by chemical action from the brown sand above. The bottom of the ditch was not reached, but the existence of a quarry ditch was clearly demonstrated.

*Period 2 (a) Perimeter Postholes* (Pl. IA, Figs. 2 and 4). Turf and about 6in. of dark brown sand were removed from Quadrants A and C and later the two areas were joined by the central cutting. The sand then gradually changed to an orange-brown colour which was removed in thin layers down to c.12-14in. below the surface, but rather less at the northern perimeter where the ground fell away. The perimeter postholes showing as grey patches had this dark sand removed. Those in C were at about 3½ft. centres with a gap between PH. 1 and 2. The bottom of PH. 9 was only discovered when more sand was removed, so it is possible that there was another hole between PH. 1 and 2. The postholes in A were less regular in plan and spacing, and there was a double posthole (PH.8) and another (PH.11) set back 2-3ft. behind the main line. No holes contained any packing stones. The possible diameters of posts varied from 5in. to 12in., more than half being c.6in.; the depths measured from the surface were 15in. to 24in., with an average of 18in.

Objects in the postholes were scarce and were near the top of each hole when found. PH.2, which had two depressions at its base, but which resembled a single posthole when first revealed, had a fragment of roof tile, which could be medieval, 3in. below the general excavation level. PH.4 contained a piece of harder, more modern roof tile at 2in. down; PH.6 had a post-medieval sherd on top and a fragment of pig jaw 3in. down. This bone fragment was much decayed and may be presumed to be medieval. The finds in the postholes, which were all in Quadrant C, being so close their tops are of little use in endeavouring to assign a date to the erection of the palisade or fence. Pottery dating from the late-17th and early-18th centuries and a sprinkling of 13th century sherds were found in the 12 to 14in. of sand removed over the cuttings. None of the later pottery was found more than an inch or two below this level. The medieval sherds in this upper level were confined to the central cutting and Quadrant A.

An extension was made in C going down the slope of the mound without revealing any postholes. Two cuttings were made outside the perimeter in D. The northerly one showed no features, but

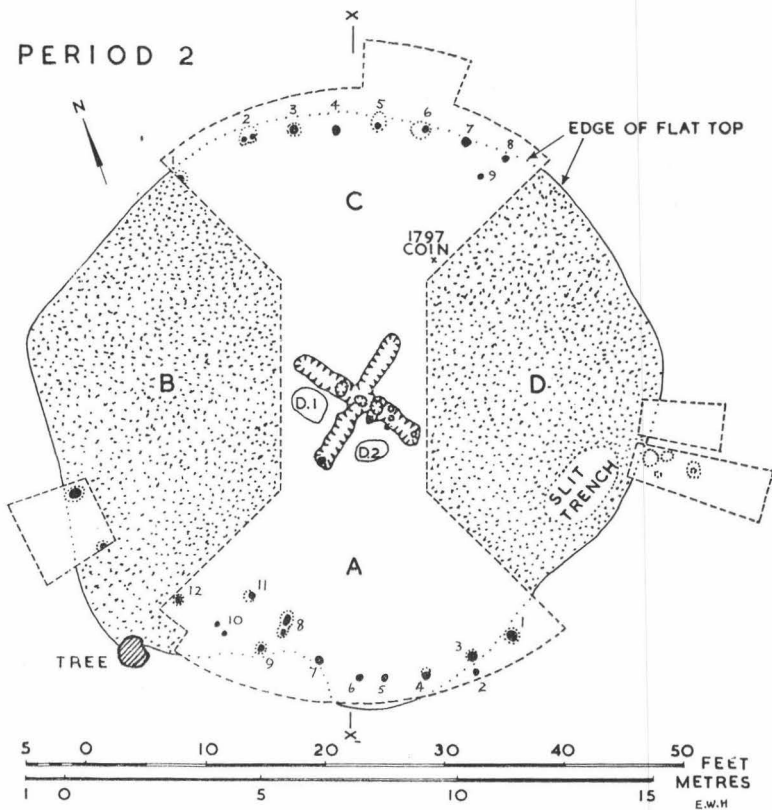


FIG. 2. Period 2. Plan of Motte top excavated 12-14ins. below surface

the southerly one had some wet patches of sand (there had been heavy rain the night before) which started to appear at *c.*30in. below the flat surface of the motte top. The wet sand was removed and apparently it ceased at *c.*54in. below the surface in the hole nearest the perimeter. The other holes were indefinite. While these may be postholes associated with either Periods 1 or 2, some other shapeless damp patches could be seen in the baulk rising to the surface, and in view of similar patches in B, they are considered more likely to be sand earlier occupied by trees or roots.

The cutting on the perimeter of B showed two more Period 2 palisade postholes at 5ft. centres, as patches of darker sand. They were cleared and found to be 24in. and 26in. deep below the surface. The south-western part of this area was dug to 29in. below the top surface, but all that showed was an amorphous mass of irregularly shaped damp patches of sand which obviously were not postholes.

The conclusion drawn was that they had some connection with earlier tree roots.

(b) *The Central Feature* (Pl. IB, Figs. 3 and 4). At 12-14in. below the surface a cross-like feature showed faintly as dark grey sand, c.13ft. SW.-NE. and 12ft. 6in. SE.-NW. Each arm was c.18in. wide and from 3-5in. deep, as hollows. The darker sand continued deeper in places to form several shallow depressions and possible stake holes. It was noticeable that the sand removed from this feature contained numerous small fragments of flint valley gravel, up to 1½in. by 1in. in size, as many as a dozen to each square foot of the hollows. The number of these chips of flint exceeded all those found throughout the whole of the Period 2 excavation. They must, therefore have been spread deliberately below and before the crosstrees of the superstructure were laid down. One sherd of pottery c.1700+, 8 sherds of c.1550-1600 and 12 13th century sherds were in the dark sand of the cross. The 16th century sherds were mainly in the centre of the cross and two similar sherds were found in the bottom of the 12-14in. of sand removed, south of the crosstrees.

(c) *Dog Graves, D.1 and D.2* (Fig. 2). No signs of the graves were seen in the exposed sand at 12-14in. below the surface, the skeletal remains being discovered while removing sand to a lower level. When sectioned, the edges of grave D.1 could be seen faintly, but the sand did not change colour. The depths of the graves were between 30in. and 36in. below the surface.

(d) *Coin Burial* (Figs. 2 and 4). When removing sand at the east side of C, a 1797 penny was found at 22in. below the surface. While no outline of a posthole or pit was seen in plan, there were faint traces at the vertical east edge of the cutting to show that a small hole had been dug to bury the coin, but there was nothing else in that part of the hole which was excavated.

*Period 1* (Figs. 3 and 4). Sand was removed to a depth of 5ft. 9in. from the surface at one point. It was only here that some traces of stratification could be seen (see section in Fig. 4), which are interpreted as tip lines. Elsewhere, parts of A, C and the central area were dug down to between 3ft. and 4ft. from the surface. Postholes A.6 and 7, and C.7, 8 and 9, were cut away, but no earlier postholes were discovered. A 2in. layer of clayey sand, which was no more than material taken from the river bank, was uncovered at c.39in. below the surface, and it sloped slightly to the south (see Pl. IA), passing below grave D.1. The top of this material was flecked with charcoal. No structural features were found associated with this clayey layer. Its shape, rather like a reversed letter L, may have no significance and in the absence of any obvious explanation the layer is considered fortuitous. Its irregular flatness suggests that it was trampled underfoot. There is a possibility



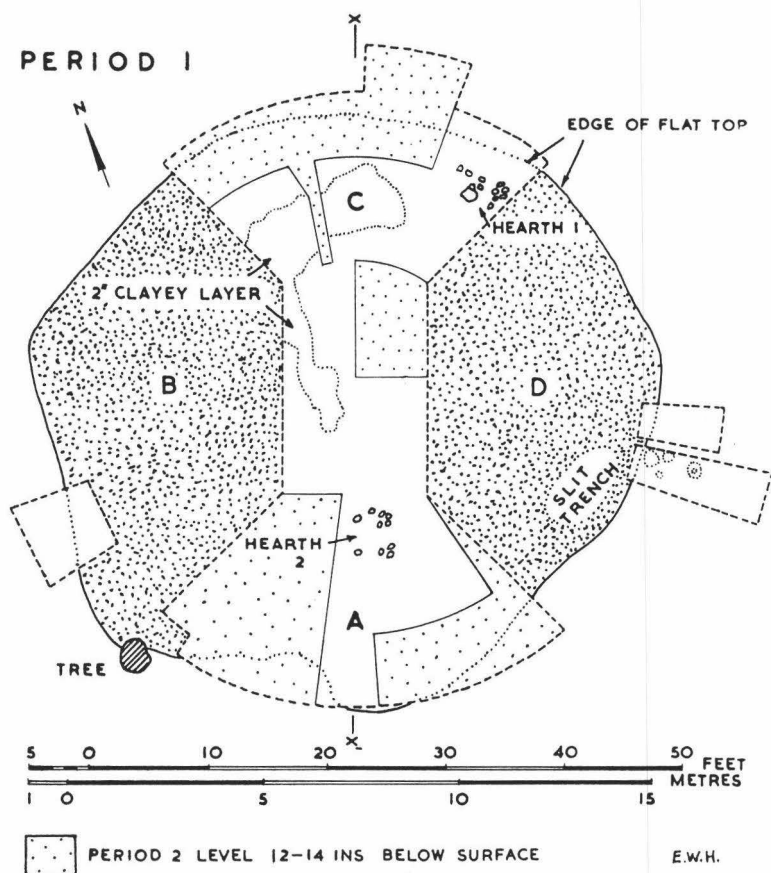


FIG. 3. Plan of Motte top excavated to Period 1 level

that the clayey layer may have been associated with some light-weight temporary shelter while the hearths were in use, the stake-holes of which left no marks in the sand, but this is but a suggestion and has no factual basis.

Two hearths were found, each roughly delineated by groups of large stones from the valley gravel, Hearth 1 in C and Hearth 2 in A. Associated with both hearths were fragments of charcoal and 13th century pottery. About one quarter of a cooking pot (shown as 'C.POT' in section on Fig. 4, and see Fig. 6, 26) was at the base of Hearth 2 in a charcoal layer below the stones.

In addition to 13th century sherds throughout the upper part of the mound, two pieces of decorative bronze stripping were found;

one piece on top of the clayey layer in C (Fig. 6, 37), another 6in. deeper, just north of Hearth 2 (Fig. 6, 36) and two pieces of a bronze pin; one with the head (Fig. 6, 38) which came from immediately above and the other (not drawn) from below the clayey layer in C. The shank of the pin passes through the hole in one of the strips and may belong to it. Such bronze stripping is considered to be of 12th or 13th century date.<sup>1</sup> A piece of wavy-edged iron horseshoe (Fig. 6, 40) came from the deeper central excavation between 4ft. and 5ft. below the surface. The iron arrowhead (Fig. 6, 39), c.13th century, is from the same cutting at 4ft. 3in. down. A few animal bones and iron fragments, much decayed, and some charcoal, were recovered throughout the excavation.

### DISCUSSION

The 13th century pottery, the bronze decorative stripping (often found in castles and mottes), the arrowhead, as well as the general appearance of the mound suggest that the earthwork is a medieval motte, though without a bailey. Protected by the river on the west and north no bailey would perhaps have been essential and mottes without baileys are not uncommon.

The occupation of the motte as a defensive position, as at Abinger,<sup>2</sup> or as depicted on the Bayeux Tapestry, was not definitely established. There must have been a halt in construction when the hearths were in use, but this need not have been for any lengthy period. The palisade could not have been erected during the life of the hearths, for the postholes were at a higher level and those in C are close to Hearth 1. One cannot conceive a motte being constructed of sand with the central part of the top lower than the upper edge of the outer slope. Even had this form been adopted the sand behind the posts would need revetting, but of which there was no sign.

No archaeological evidence was produced to date the erection of the palisade, but if, as discussed below, the cross feature represents the base of a later windmill, the latter would hardly need a fence around it. On balance, therefore, the palisade may be associated with the 13th century, but there can be no certainty. Postmills were sometimes winched around with the aid of posts, but Mr. Rex Wailes considers that the perimeter posts would not have been strong enough because of the instability of the soft sand. Despite careful excavation, no signs of corner posts of a central tower were found as at Abinger.<sup>3</sup>

The impressions of crosstrees in the centre of the motte top have been suggested to represent the base of a post mill, a type of mill in use from the medieval period until the 19th century, where

<sup>1</sup> For references, see p. 124.

<sup>2</sup> B. Hope-Taylor, 'The Excavation of a Motte at Abinger in Surrey,' in *Arch. Journ.*, vol. 107 (1952), pp. 15-43.

<sup>3</sup> *Ibid.*, pp. 28-29.

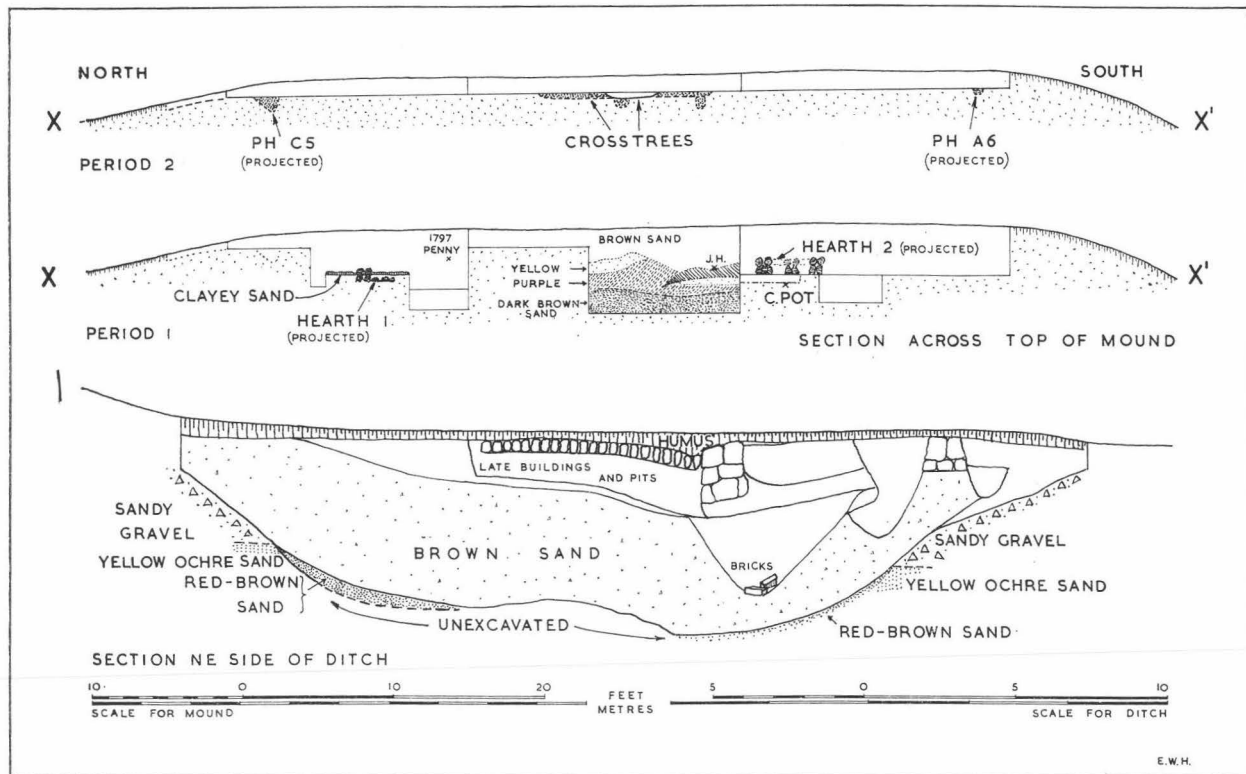


Fig. 4. Upper: Sections, Periods 1 and 2. Lower: Ditch Section

the body of the mill revolves on a central post secured to the bottom crosstrees. The two dog graves may be significant in that they are placed *between* the arms of the crosstrees depressions. While it is possible that this is by chance alone, had the timbers of the crosstrees been in position when the graves were dug, then the latter would have of necessity to be excavated between the arms. If this is accepted, then the good state of preservation of the dog skeletons, as compared with other animal bones, suggests a post-medieval date. There is no windmill shown on the 1629 estate map, or on Budgen's map of 1724,<sup>1</sup> and the possibility of the crosstrees being the base of a Napoleonic period signalling station may be discounted, as O.S. map, sheet 9, dated 1813 (in the B.M.), shows a signalling station on the Downs south-west of Selham, thus demonstrating that signalling stations were plotted, but nothing is entered against Lodsbridge Mill. The crosstrees are unlikely to have been the base of a gallows, because there is in Lodsworth parish, to the south, a 'Gallows Hill.'<sup>2</sup> The fact that all but two sherds of the pottery c.1550-1600 were found roughly in the centre of the crosstrees depressions may suggest that the structure was erected after that date. The pottery around 1700 in the upper 14in. of sand could be associated with the period of the structure.

There is still some doubt in the mind of the writer that it was a windmill. There was no sign of the accidental scraping of a tailpole or ladder, or a circular path, or stepping stones used by the miller when pushing against the tailpole as at Lamport mill.<sup>3</sup> Only a dozen fragments of clay pipe stems were found—which may mean only that all millers were not heavy smokers! There were but six fragments of iron nails recovered, no tools, chisels, bolts, or any parts of a mill, whereas the second mill at Lamport, of 17th century date, left behind 1,500 nails and bolts. Even had a mill been dismantled carefully, there would surely have been more nails to be found although the whole top of the mound was not excavated. Despite the acidity of the sand, some ironwork was seen to survive.

<sup>1</sup> *Sussex Archaeological Collections* (abbreviated hereafter to *S.A.C.*), vol. 20 (1868), p. 204. A letter describing the effects of the great storm of 1703 in Midhurst and its neighbourhood was sent to Defoe in 1704. This does not contain references to any windmills having been damaged, although houses, barns, trees and Cowdray House suffered. This evidence does not help in establishing whether or not a windmill existed at Lodsbridge in 1703.

<sup>2</sup> Parish boundaries were often marked by 'cross-dowles' cut into the ground, but the parish boundary here passes the base of the mound on its south-western side and not across its centre. See *S.A.C.*, vol. 23 (1861), p. 243 for an example dated 1656; or *Surrey A.C.*, vol. 60 (1963), p. 87, at Shalford in 1734 regarding the perambulation of a parish boundary, '... where we renewed an old mark being a cross cut in the ground at the top of the hill.' No indication of the size of such a cross is given. Mr. R. W. Williams kindly drew attention to the Surrey reference.

<sup>3</sup> M. Posnasky, 'The Lamport Post Mill,' in *Journ. Northants. N.H. Soc. and F.C.*, vol. 33 (1956), pp. 66-79.

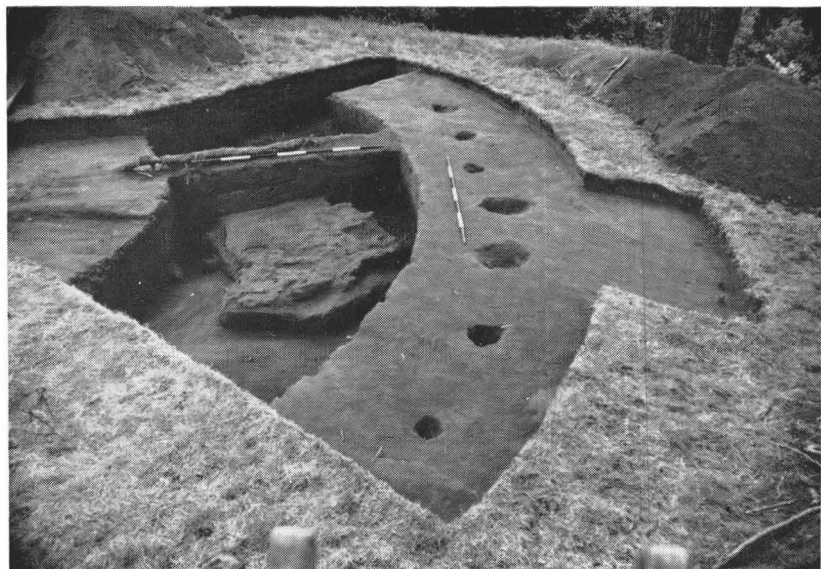


PLATE IA. Quadrant C, showing Period 2 postholes and Period 1 clayey sand layer

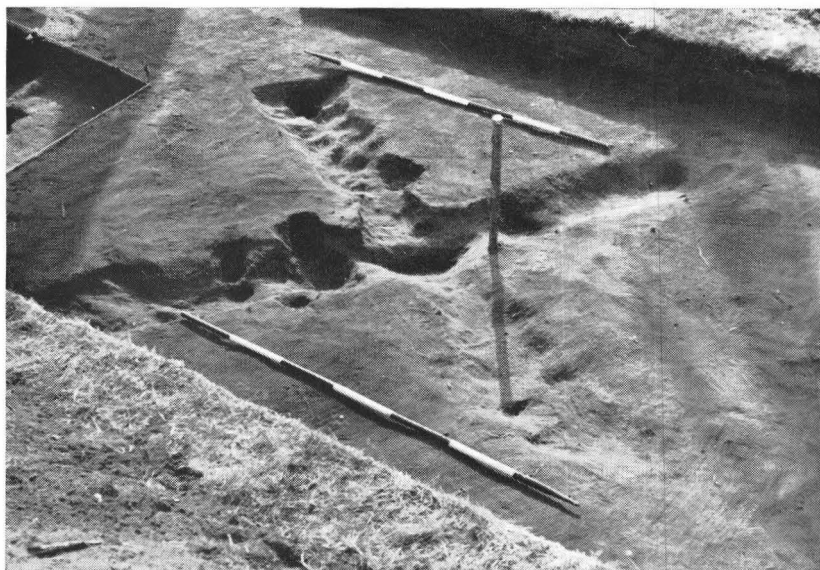


PLATE IB. Period 2, impressions of crosstrees from north-east

Further doubt was felt as to the necessity of a windmill close to a watermill, but this association is not unknown, as Mr. Wailes has kindly explained, because more work could be achieved at busy times and a windmill would be invaluable should the water supply fail. The latter contingency was never likely at Lodsbridge.<sup>1</sup> Another factor against a windmill in this position is that there is no (now visible) path to the top. It would have been a most laborious task manhandling sacks up and down the slope of the mound, although not an impossible one.

While the balance of opinion of other archaeologists who visited the excavations favours the structure on top of the mound as a post-medieval windmill, it cannot be said to be conclusive. Should the dog graves have missed the arms of the vanished crosstrees, the 16th century sherds were dropped, again by chance, so as to descend naturally into the central part of the crosstrees, and the pottery around 1700 found all over the area just below the topsoil represents but the remains of numerous picnics, then the central feature could be of earlier date, even a medieval windmill. As an alternative to the windmill theory, is it not possible that some form of central tower was put up in the 13th century, not with corner posts sunk into the sand, or descending to the natural soil at the bottom of the mound, but on a timber foundation resting on the surface? This could have contained diagonal crossbraces below a rectangular timber base, c.8ft. square,<sup>2</sup> on which a small tower or observation platform might have been erected. If a windmill can stand erect on heavy crossed timbers, so could a small tower, as its own weight would be sufficient to keep it in position and the method of construction would spread the load over soft ground instead of concentrating the pressure at the corners. The discolouration of the sand suggests that the palisade posts rotted in position and were not removed. The same applies to the crosstrees, though any structure above (and there is no proof that there was one) is likely to have been taken away.

It is to be regretted that firm evidence of dates cannot be assigned to the palisade and the crosstrees. Differing suggestions of the sequence of construction are summed up below.

After the final topping-up of the mound following the use of the hearths in the 13th century:—

- (a) The work was abandoned, or,
- (b) A palisade was erected around the perimeter not long after the topping-up in the 13th century. The small amount of medieval pottery in the upper 14in. and none in the ditch silting suggests limited use.

<sup>1</sup> Information kindly provided by Dr. R. G. Thurrell.

<sup>2</sup> The Abinger tower was 12ft. square. Mr. Hugh Braun kindly answered some queries regarding mottes in general before the excavations were conducted. In his letter he suggested that the main posts of timber towers could be founded on massive horizontal timber sills instead of corner posts requiring postholes.

(c) A tower, windmill, or other structure with crosstrees as a base was put up at the same time as the palisade in the 13th century, or,

(d) The period of abandonment lasted until c.1700 when a post windmill was erected, the superstructure of which was removed carefully after a few years.

(e) The palisade or fence might also be c.1700.

Strategically, a motte (if it ever was used as such) at Lodsbridge would seem to be of little military value. It was small and could not hold many men; but this is a problem common to other small mottes. A large force would not be deterred by such a meagre garrison and could bypass it easily. The river is narrow and would not be difficult to cross up or down stream. Perhaps it could have been used as a strong-point for policing the neighbourhood in troublous times, such as the insurgency suggested in West Sussex in 1216.<sup>1</sup>

### WORK STUDY

The time taken to construct the Lodsbridge motte is conjectural because the labour output of medieval people is unknown. The following attempt to calculate the number of man-hours required is not without interest and demonstrates that the making of this comparatively small mound was not a task to be undertaken lightly.

The volume of the mound, being a frustum of a cone, 130ft. bottom diameter, 50ft. top diameter and 16ft. high above ground level, comes to 4020 cubic yards. Making some provision for a fall of land towards the river we may allow for a volume of c.4500 cu. yds., or 121,500 cu. ft. For this exercise it will be assumed that the mound was made on level ground from an encircling quarry ditch. Using R. J. C. Atkinson's empirical formula for chalk<sup>2</sup>

$$H = \frac{V(120 + 8L + 2F)}{1000}$$

where H equals the total man-hours required, V is the volume of chalk in cu. ft., L (lift) is the vertical distance and F (fetch) the horizontal distance between the centres of gravity of the mound and the ditch. At Lodsbridge, L is about 10ft. and F, 85ft. Thus  $H = 121.5(120 + 80 + 170) = 44,955$  or, in round figures, 45,000 man-hours. Chalk is much harder to dig than sand, so reference was made to B. Price Davies' textbook<sup>3</sup> where the following data is given in man-hours per cu. yd.

<sup>1</sup> *S.A.C.*, vol. 22 (1870), p. 18.

<sup>2</sup> *Antiquity*, vol. 35 (1961), p. 295, n. 7.

<sup>3</sup> B. Price Davies, *Estimating for Buildings and Public Works*, 9th edn. (1939), p. 203.

	<i>Firm Sand</i>	<i>Soft Rock</i>
Excavating, using hand-tools	0.8	3.0
Basketing, per 60ft.	1.0	1.5
Spreading	0.3	0.3
	<hr/>	<hr/>
	2.1	4.8
Add 50% to basketing for 85ft. instead of 60ft.	0.5	0.75
	<hr/>	<hr/>
	2.6 man-hrs.	5.55 man-hrs.
	<hr/>	<hr/>

Working on this basis, we have  $2.6 : 5.55 :: H : 45,000 = 21,081$  man-hrs.

Compare these figures with the digging of a trench and building a bank in chalk at Overton Down, Wilts.,<sup>1</sup> where  $F = 20\frac{1}{2}$ ft. and  $L = 5$ ft. The overall rate there, including depositing the excavated material, using primitive tools was 3 cu. ft. per man-hour and 3.58 cu. ft. for modern hand-tools. Ignoring the difference in Fetch and Lift and allowing for, say, an average of 3.30 cu. ft. per man-hour, and for the difference between sand and chalk, we have:

$$\frac{121,500 \times 2.1}{3.3 \times 4.8} = 16,108 \text{ man-hrs.}$$

Basketing a further 60ft. on Davies' reckoning would need another hour per cubic yard. Thus  $16,108 + 4,500 = 20,608$  man-hours, which is less than  $2\frac{1}{2}\%$  below those calculated from Atkinson's formula. If a little more time is allowed for the lift being twice as high as at Overton Down, a total of somewhere in the region of 21,000 man-hours would appear to be reasonable, which is almost the same as the calculation based on Atkinson's formula.

Thus, 50 persons, working a ten-hour day, would require 42 days of reasonably fine weather and longer if delayed by spells of heavy rain. A small task when compared with some of the enormous earthworks of prehistoric and later times, but nevertheless, a time-consuming chore if carried out by impressed labour from the neighbourhood and one to hinder normal agricultural operations.

### THE FINDS MEDIEVAL POTTERY (FIGS. 5 AND 6)

Medieval pottery was sparse down to 14in. from the surface of the motte, then it became more frequent. Similar rim forms, bases and body sherds were found at all levels. From this it would appear that no great length of time elapsed during their deposition and they may be considered as a fairly homogeneous group. It is, of course, possible that part of the pottery was brought up from

<sup>1</sup> P. A. Jewell, ed. *The Experimental Earthwork on Overton Down, Wiltshire*, 1960 (Brit. Assn., Report of a Research Committee).



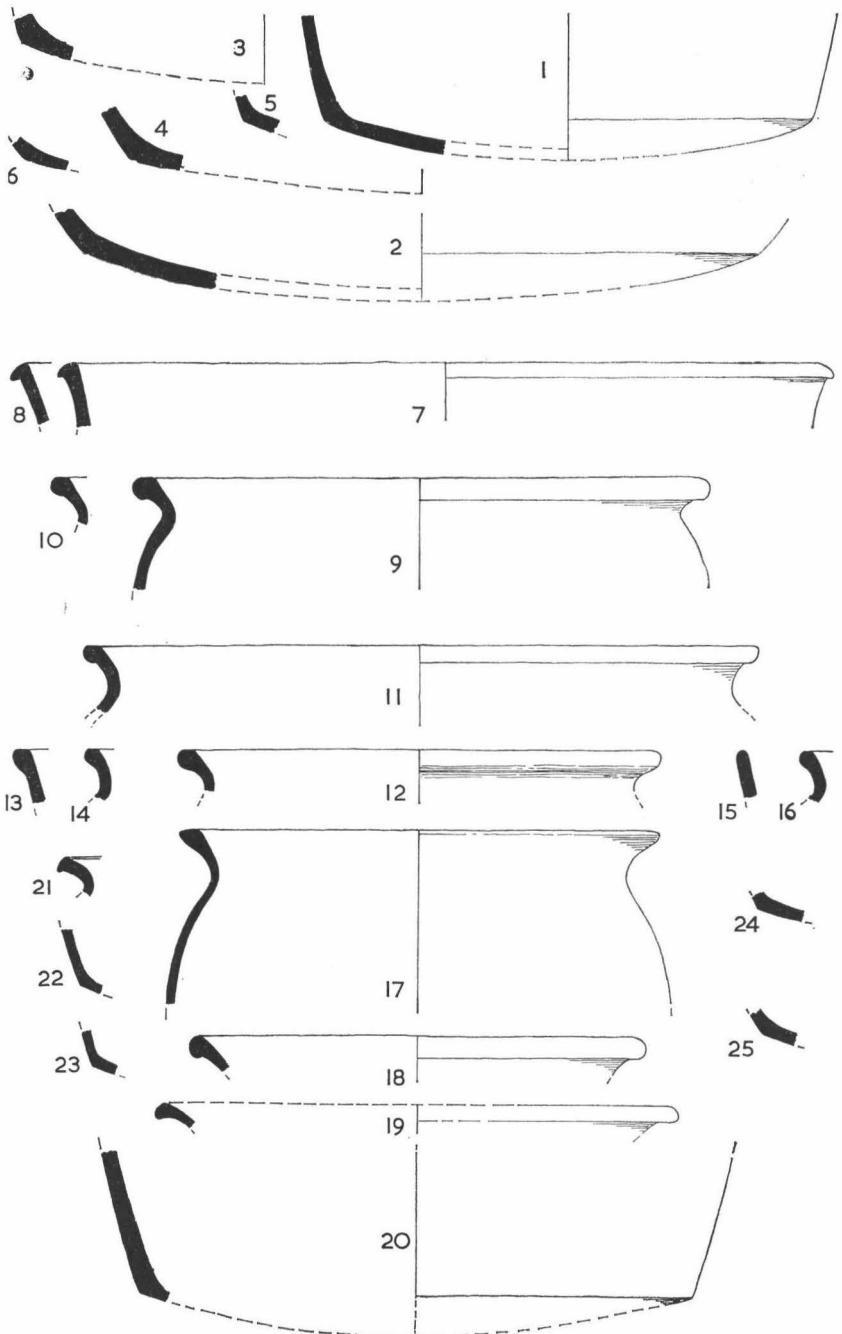


FIG. 5. Thirteenth century pottery, 1-25 (±)

ground level during the construction of the mound, but some sherds, particularly those from soot-blackened cooking pots, were found associated with the hearths and they do not differ substantially from the remainder. Coarse wares containing large-grained sand or flint filler, which are associated with the 11th and 12th centuries, were absent. The pottery was divided into four groups, A, B, C and D, according to the size of the filler, which in most cases is a quartz sand; but with the exception of the finer wares in group D, there is little difference between the others. No rims could definitely be associated with bases, apart from two complete profiles. The total weight of pottery found was 13lb. 4oz. and the majority of sherds came from cooking pots and storage vessels. Bowls are probably represented by nos. 7, 8, 18 and 19, jugs by nos. 29, 30, 34. The minimum number of vessels represented is: 36 cooking pots or storage vessels, 3 bowls and 3 jugs. All pottery is wheel-thrown. Only five pots bear traces of glaze.

*Description of Medieval Pottery* (Figs. 5 and 6). Only sherds deserving comment will be described individually.

*Group A* (Fig. 5, 1-8). A rough fabric, pale grey or red-brown externally, grey, buff or red-brown internally, all with grey cores. The filler in the clay body is of medium-size sand grains, plus some soft non-calcareous inclusions. No. 8 is about the same diameter as 7.

*Group B* (Figs. 5, 9 and 10). A rough fabric, buff inside and out, grey core. The clay body is the same as in Group A, but there are no soft inclusions. No. 9 contains a speck of shell and so does no. 1 in Group A. The diameter of 10 is perhaps a little more than 9. A number of body sherds (not drawn) are pale grey-buff externally, grey internally and with a grey core. They bear traces of a yellow or orange glaze externally, but so little of the glaze remains that it is difficult to be more exact as to colour. These sherds are from a large vessel or vessels and occurred from at least 14in. to 43in. below the surface, a little north of Hearth 2.

*Group C* (Figs. 5, 6, 11-31). A slightly smoother fabric than A or B, the colour externally and internally passing through buffs, pinks and browns. Cores generally are grey, except for 17, which has been oxidised, and 19 is black throughout, including the faces.

Approximate rim diameters are: 13-6in., 14-10in., 15-9in., 16-11in. and 21-10in.

25. A small sherd of convex base with traces of internal green glaze. From same level as clayey-sand layer.

26. Profile of cooking pot from the base of Hearth 2. It has the beginning of a convex base and there are traces of soot externally, and some black residues inside. Marked on section drawing as 'C.POT' (Fig. 4).

27. Similar colour and fabric to 26, with a more rounded basal angle, sooted outside. Found on clayey sand layer.

29. Rim and piece of handle from a jug, pink colour out and in. Decorated by rillings below the rim. There are some patches of green glaze externally and a patch of brushed white slip internally.

30. A well thumbled jug handle fragment bearing traces of yellow-green glaze, a pink colour below. Typical of 13th century large jugs. Marked on section drawing as 'J.H.' (Fig. 4).

31. Several body sherds (one drawn) brown in colour with a grey core, broadly and coarsely striated on the outer face. Black residues on some sherds externally.

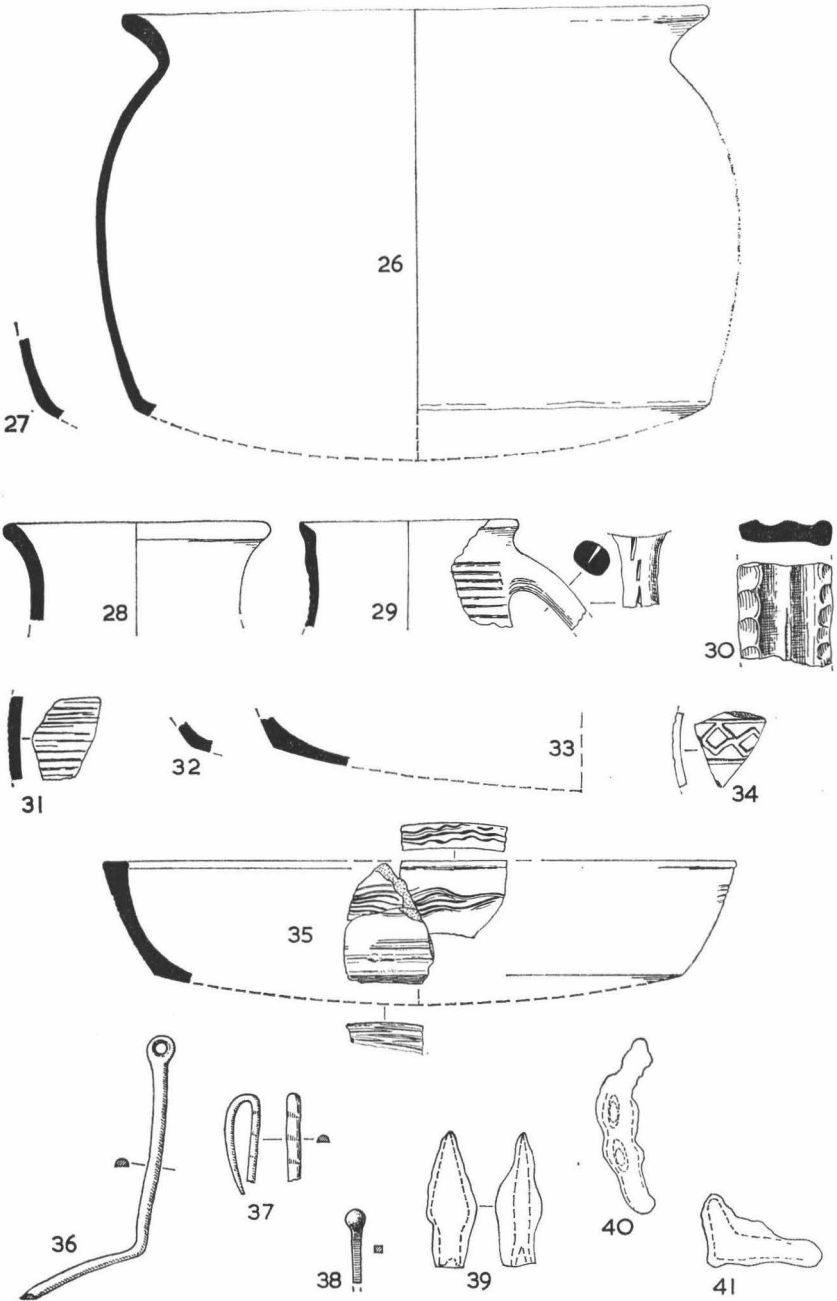


FIG. 6. Thirteenth century pottery, 26-35 (¼).  
Bronze objects, 36-38 (½). Iron objects, 39-41 (¼)

*Group D* (Fig. 6, 32-35). A smoother fabric than C containing a finer sand filler. Very little of this pottery was found. Nos. 32-34 came from near Hearth 2.

32. Sherd of convex base with somewhat rounded basal angle, red-brown colour outside, grey inside, grey core.

33. Convex base (diameter is approximate), grey-buff outside, buff inside, grey core.

34. Green sherd from ? jug, pale brown outside, buff inside, grey core; patchy green glaze on outer face over roughly grooved excised decoration.

35. Shallow bowl with convex base, brown outside, red-brown inside, grey core. The flat-topped rim, which is slightly beaded inside and out, has excised wavy lines. The wall has been scratched similarly in a series of undulating waves. There is evidence of wiping the plastic clay with a coarse cloth, or crude turning, near the base and on the underside. From the upper 12-14in. in Quadrant A.

*Dating of the Medieval Pottery.* The dating of medieval pottery in Sussex, as in many other counties, is still beset with difficulty owing to the lack of closely dated groups, despite the number of medieval excavations conducted locally during recent years. Cooking pots are notorious for the long life of their forms and some of those from the Lodsbridge site (e.g. no. 26) might be dated as 12th century had their clay bodies been coarser with large gritty inclusions. Until more work is done, and stratified, dated groups of pottery obtained, any time range applied to our site must be considered as tentative. The remains of partly-glazed jugs, 29 and 30, on the analogy of those found at Hangleton<sup>1</sup> and elsewhere in Sussex, suggest a 13th century date. The few metal objects associated with the pottery cannot be dated to within a few years, so they are not of great help. Nevertheless, assuming they are not survivals, they would fit a 13th century context. From then on there is a long gap in the pottery sequences until the second half of the 16th century.

#### POST-MEDIEVAL POTTERY (FIG. 7)

Such pottery was not found lower than 16in. below the top of the mound. The total weight is only 5½lb., representing a minimum number of vessels: 21 shallow bowls, plates or dishes, 11 storage or similar hollow wares, 3 jugs, 6 finer cups and small dishes, 2 stone-ware jars. The earliest consists of a few body sherds of unglazed grey ware from part of the crosstrees depression and two more sherds nearby, which are c.1550-1600. Another gap occurs until the latter part of the 17th century. This pottery forms the bulk of that found which can be dated around 1700, plus perhaps 25 years, but which may go back into the closing years of the 17th century. The clay body of the coarser wares, 42-56, appears to Miss P. A. M. Keef to be of similar clay to that found in a 17th century kiln site at Graffham, which is not far from Selham (in course of excavation by Miss Keef), but the Lodsbridge pots did not emanate from that kiln.

<sup>1</sup> *S.A.C.*, vol. 101 (1963), pp. 128-131.

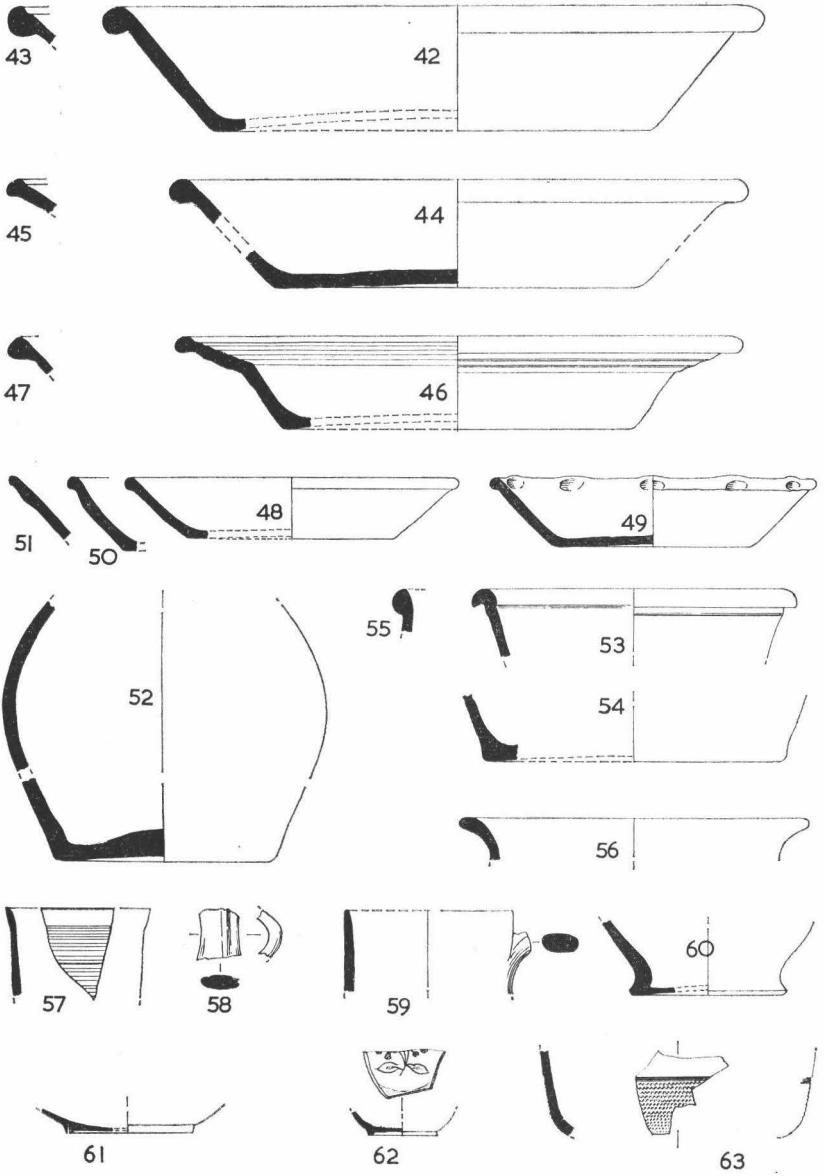


FIG. 7. Post-medieval pottery, 42-63 (¼)

*Description of Post Medieval Pottery (Fig. 7).*

*Coarser wares.* 42-50. Shallow bowls, plates and dishes mostly pink in colour throughout the fabric, demonstrating oxidising conditions, all glazed internally, including the rim, in green, yellow-green, or orange. 49 and 50 have some patches or spots of glaze externally.

51. Rim of unknown type of vessel, angle uncertain, possibly c.4½ in. diameter, grey fabric, green glazed inside and out.

52. Body of ? jug, pink both sides with grey core, some patches of thin green glaze outside and similarly inside on the base and lower part of the walls.

53. 54. Rim and base of ? storage jar. These sherds may belong to the same pot, provided it had a bulbous body. A pink fabric with a good orange glaze inside. 54 has splashes of yellow and green glaze on the underside of the base.

55. Rim of large ? storage jar. Pink fabric, orange-brown glaze inside.

*Finer wares.* 56. Rim of ? storage jar. A hard grey fabric, well glazed each side in an olive-green colour. From top of posthole C.6.

57. Rim of small ? jug with hard buff fabric, mottled brown glaze inside and out, with horizontal rillings around the body. Another sherd (not drawn) of similar fabric, glaze and decoration, but not from the same vessel, is part of the spout of a jug.

58. Part of a small jug handle. A similar ware and glaze as 57, but not the same vessel.

59. Rim and part of handle of small jug. The fabric is not so fine as 57 or 58 and is pink, glazed all over in green with mottled brown spots.

60. Base of a Bellarmine-type vessel of pale grey stoneware.

61. Base of a small bowl or dish, of thin, fine buff fabric, greenish-brown external glaze, brown glaze inside.

62. Base of cup, with hard buff fabric, white salt glaze inside and out, with painted flower and leaf decoration in three colours. This sherd was kindly dated by Mr. G. H. Tait to 1740-1750.

63. Lower body sherd of a bowl, brown salt-glaze on open-textured buff fabric. The lower part with a horizontal rouletted zone defined by two narrow grooves on the upper margin. Nottingham ware, probably mid-18th century and unlikely to be earlier than c.1720.

## SMALL FINDS

The upper 14 in. of the mound top yielded 12 small pieces of clay pipe stem, a microlith, a gun-flint and a fragment of 1 in. thick plain unglazed medieval (?) floor tile, plus a little modern china, and some fragments of broken roofing tiles with a hard red body. Only six fragments of iron nails were recovered from the excavations, all of which were too corroded to be drawn. A possible bronze and iron safety-pin or brooch was found between 12-24 in. down, but the construction was not revealed by X-rays.

*Metal Objects (Fig. 6).*

36. A piece of bronze strip, approximately half-round in section, broken at one end. The other end is expanded and perforated with a bevelled hole. Found north of Hearth 2 at 42 in. below the surface.

37. Broken piece of bronze strip of similar section to 36, bent into a loop, probably by accident. One end is broken, the other reduces in thickness. Traces of diagonal gadrooning are visible on the rounded face. Found on clayey sand layer in Quadrant C.

38. Piece of bronze pin with square shank and rounded head. Found near 36. Another fragment of square pin came from below the clay layer.

The two do not join, but they are of about the same section, although it cannot be ascertained that they necessarily belong to one another. The pin with the head fits the hole in 36 and it could therefore have been the means of attachment to some other object not less than  $\frac{3}{4}$ in. thick.

Decorative strips of bronze, or gilt-bronze, with or without attachment holes and gadrooning, have been found on fourteen castle and manorial sites of the 12th and 13th centuries. Professor E. M. Jope lists these sites in *Antiq. Journ.*, vol. 39 (1959), pp. 267-8. He suggests that such strips are the ornamental fixings from perishable materials such as leather or wood. To his references may be added: Long Buckby, Northants. (motte and bailey), *Journ. Northants. N.H. Soc. and F.C.*, vol. 33 (1956), pp. 60, Fig. 3, and in which other references are given, viz., 12th century site at Eaton Socon, Beds., *Proc. Woolwich Antiq. Soc.*, vol. 15, and *Trans. Camb. Ant. Soc.*, vol. 45 (1951), pp. 1-3, Fig. 1. Gilt-bronze strips were found at Bramber Castle excavations in 1966 (in progress), and Dr. J. Kent informs the writer that he found some at the motte and bailey of South Mimms (in progress). These decorative pieces of metalwork are thus fairly common, but their exact purpose is as yet unknown.

39. Iron arrowhead with socket, too decayed and corroded for cleaning, but X-radiographs enabled it to be drawn. The nearest parallels in *Lond. Mus. Med. Cat.* are Fig. 16, Type 10 and Fig. 17, 5, about mid-13th century. From the deeper cutting north of Hearth 2 at 51in. below the surface.

40. Part of iron horseshoe much covered with corrosion products. X-radiographs enabled two holes (suitable for fiddle key nails) and the wavy edges to be seen. Such shoes persisted from Norman times until at least the middle of the 13th century (*L.M.M.C.*, p. 115 and *Antiquity*, vol. 40 (1966), p. 305).<sup>1</sup> Found near jug handle (Fig. 6, 39) between 43in. and 62in. below surface.

41. An angled piece of iron, heavily corroded. X-radiographs show the original shape, but one end may be broken. It could be a door-pivot or part of an iron cramp or dog. Found near glazed sherd (Fig. 6, 34) between 14in. and 42in. below surface.

### Coins.

Two Victorian halfpennies came from near the surface. One penny, dated 1797, was found in a small pit in Quadrant C, 22in. below the surface.

*Animal Remains*, based on a report by Mrs. B. Westley. The full report is filed at Barbican House, Lewes.

The upper 12-14in. of the mound top contained 3 fragments of sheep/goat and 6 of cattle. One of the latter was a distal humerus, worn flat on one side, that has apparently been used as a rubber or pestle. The animal was small, not as large as a modern breed. Between 14-24in. down, 2 molars, fragments of a deciduous molar and some indeterminate fragments, all of pig, were the only animal remains apart from the dogs. A maxilla fragment of pig came from Posthole C.6, 3in. from the top.

*Dog Grave 1.* A fairly large (greyhound size?) animal, an adult, but not old. The teeth are moderately worn. Also from this grave were some rib and vertebral fragments of sheep/goat and some rodent remains, possibly vole.

*Dog Grave 2.* This animal is younger and smaller than that in Grave 1. It is rather fox-like, though somewhat larger and sturdier than a fox. The teeth are unworn and healthy, the epiphyses of the vertebrae unfused, which shows the animal to be immature. Two deciduous molars of pig and indeterminate fragments were in the grave.

The dog bones probably are not modern, but are much younger than the other skeletal remains, most of which were decayed.

<sup>1</sup> Wavy-edged horseshoes and fiddle-key nails were found in 13th and 14th century contexts at Bramber Castle excavations in 1966, but until more clearly stratified deposits are found it is not certain that this form of horseshoe continued in use in the 14th century.

*Mollusca.*

One oyster and one cockle shell from upper 14in.; 2 fragments of oyster 12-24in. down.

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